

The role of contextual factors for breastfeeding outcomes and  
their potential integration into related guidelines:  
case studies of Germany, the United Kingdom and Ghana

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## **DECLARATION OF ORIGINAL WORK**

This thesis is the result of independent research. Due acknowledgements were made where my works was indebted to the work of others. I declare that the present study has not already been submitted or accepted, nor is currently being submitted for any other degree.

Berlin, 04.11.2017

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Signature

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**Table of Content**

- Table of Content ..... iii**
- List of Tables..... vi**
- List of Figures ..... viii**
- List of Abbreviations ..... ix**
- Abstract ..... xii**
- 1 Introduction..... 1**
- 2 Background..... 7**
  - 2.1 Global Child Health ..... 7**
  - 2.2 Definitions and Trends of Breastfeeding ..... 8**
  - 2.3 Breastfeeding and Benefits for Child Health ..... 10**
  - 2.4 Breastfeeding and its Effects on Maternal Health..... 12**
  - 2.5 Major Health Risks Transmitted through Breast Milk ..... 12**
  - 2.6 Factors Impeding and/or Inhibiting Breastfeeding ..... 13**
  - 2.7 History of Infant Formula Feeding ..... 15**
  - 2.8 Strategies to Promote Breastfeeding ..... 16**
  - 2.9 Contexts of Breastfeeding: The Care Continuum ..... 20**
  - 2.10 Determinants of Breastfeeding ..... 21**
  - 2.11 Social Determinants of Health..... 23**
  - 2.12 Interventions to Promote Breastfeeding ..... 25**
  - 2.13 Guidelines as an Intervention to Promote Breastfeeding ..... 26**
    - 2.13.1 Tools that Address the Inclusion of Social Factors ..... 28**
    - 2.13.2 The BIAS FREE Framework ..... 28**
  - 2.14 Country Examples ..... 31**
    - 2.14.1 Country Example 1: Germany ..... 31**
    - 2.14.2 Country Example 2: The United Kingdom..... 32**
    - 2.14.3 Country Example 3: Ghana ..... 34**
  - 2.15 Summary ..... 36**
- 3 Aim, Objectives and Research Questions..... 39**
- 4 Methodological Approaches Applied for this Dissertation ..... 40**
  - 4.1 Realist Review ..... 40**
  - 4.2 Causation in Realist Reviews..... 41**
  - 4.3 Guideline Analyses ..... 44**
- 5 Methods..... 45**
  - 5.1 Conduct of the Realist Review ..... 45**
    - 5.1.1 Background Search..... 47**
    - 5.1.2 Modification of List of Social Determinants of Health ..... 47**
    - 5.1.3 The Context-Mechanism-Outcome Model ..... 52**
    - 5.1.4 Preparation of the Second Search ..... 56**
    - 5.1.5 Development of a PICO Scheme ..... 56**
    - 5.1.6 Building the Search Strategy..... 58**

5.1.7	Amendment of the Search Strategy .....	59
5.1.8	Identification of Suitable Literature Sources .....	59
5.1.9	Conduct of the Second Search and Screening Procedures for all countries .....	60
5.1.10	Quality Assurance for the Screening Process.....	70
5.1.11	Performance of the First Screening.....	71
5.1.12	Performance of the Second Screening.....	72
5.1.13	Performance of the Third Screening.....	72
5.1.14	Data Analysis of Selected Studies .....	73
5.1.15	Quality Assessment of Analyzed Studies with SIGN .....	73
5.1.16	Pretests for Analysis .....	74
5.1.17	Extraction of Data and Realist Synthesis of Results .....	75
5.1.18	Limitations of the Realist Review Methodology .....	76
5.2	Analyses of Guidelines .....	77
5.2.1	Description of Guidelines from Germany.....	77
5.2.2	Description of Guidelines from the United Kingdom .....	78
5.2.3	Description of Policy and Guideline from Ghana .....	79
5.2.4	Quality Assessment of Guidelines with AGREE II.....	79
5.2.5	Limitations for the Assessment of Guideline Quality .....	82
5.3	Verification of Breastfeeding Periods in Guidelines.....	82
5.4	Guideline Analysis with the BIAS FREE Framework .....	83
5.4.1	Description of the BIAS FREE Framework Tool .....	83
5.4.2	Social Bias Analyses of Guidelines .....	86
5.4.3	Limitations of the BIAS FREE Methodology .....	89
6	Results.....	90
6.1	Studies Identified from the Realist Review .....	90
6.2	Interrater Reliability.....	95
6.3	Results of Data Extraction and Realist Synthesis.....	95
6.3.1	Summarized Findings .....	95
6.3.2	Data Extraction and Realist Synthesis for Germany .....	100
6.3.3	Data Extraction and Realist Synthesis for the United Kingdom .....	103
6.3.4	Data Extraction and Realist Synthesis for Ghana .....	111
6.4	Results from Guideline Appraisal with AGREE II.....	118
6.4.1	Results from the AGREE II Appraisal: Germany .....	119
6.4.2	Results from the AGREE II Appraisal: United Kingdom .....	120
6.4.3	Results from the AGREE II Appraisal: Ghana .....	122
6.5	Determination of Breastfeeding Periods.....	123
6.6	Results of Guideline Analyses with the BIAS FREE Framework.....	125
6.6.1	Analysis of Clinical Practice Guideline, Germany .....	127
6.6.2	Analysis of Guideline for Prevention of Allergies, Germany.....	133
6.6.3	Analysis of Clinical Guideline Postnatal Care, United Kingdom .....	137
6.6.4	Analysis of Public Health Guideline 11, Maternal and Child Nutrition, United Kingdom.....	144

6.6.5 Analysis of Under Five’s Child Health Policy .....	152
6.6.6 Analysis of National Guideline on Prevention from Mother To Child Transmission of HIV.....	161
<b>7 Discussion.....</b>	<b>171</b>
<b>7.1 Content-Related Discussion .....</b>	<b>171</b>
7.1.1 Comparison of Findings from the Realist Reviews .....	171
7.1.3 Comparison of BIAS FREE Framework Analyses .....	174
7.1.5 Discussion of Realist Synthesis for Germany .....	176
7.1.6 Discussion of BIAS FREE Guideline Analysis: Clinical Practice Guideline, Germany.....	179
7.1.7 Discussion of BIAS FREE Guideline Analysis: Guideline for Prevention of Allergies, Germany.....	181
7.1.8 Discussion of Realist Synthesis for the United Kingdom .....	182
7.1.9 Discussion of BIAS FREE Guideline Analysis: Clinical Guideline Postnatal Care, United Kingdom.....	186
7.1.10 Discussion of BIAS FREE Guideline Analysis: Public Health Guideline 11, Maternal and Child Nutrition .....	188
7.1.11 Discussion of Realist Synthesis of Results from Ghana.....	190
7.1.12 Discussion of BIAS FREE Guideline Analysis: Under Five’s Child Health Policy .....	193
7.1.13 Discussion of BIAS FREE Guideline Analysis: National Guideline for Prevention of Mother to Child Transmission of HIV.....	195
7.1.14 Assessment of Breastfeeding Periods in Guidelines .....	198
7.1.15 Model of the Breastfeeding Continuum in a Health Practice Guideline .....	200
<b>7.2 Methodological Discussion.....</b>	<b>205</b>
7.2.1 Strengths and Limitations of the Realist Reviews .....	205
7.2.6 Strengths and Weaknesses of Study Quality Assessments of Selected Studies.....	207
7.2.7 Discussion of Study Quality Assessments: Germany .....	208
7.2.8 Discussion of Study Quality Assessments: United Kingdom.....	211
7.2.9 Discussion of Study Quality Assessments: Ghana .....	215
7.2.2 Interrater Reliabilities of the Three Countries.....	218
7.2.3 Discussion of Guideline Selections.....	218
7.2.4 Appraisal of Guidelines with AGREE II.....	219
7.2.5 Strengths and Limitations of the BIAS FREE Analysis.....	222
<b>7.3 Conclusions and Recommendations .....</b>	<b>223</b>
7.3.1 Conclusions .....	223
7.3.2 Recommendations.....	226
<b>8 Reference list .....</b>	<b>228</b>
<b>ANNEXES .....</b>	<b>254</b>

## List of Tables

Table 1: Maternal Medical Conditions Affecting Breastfeeding .....	14
Table 2: Infant's Medical Conditions Affecting Breastfeeding .....	15
Table 3: Context-Mechanism-Outcome Model for Question-Testing .....	54
Table 4: PICO Aspects with Descriptions .....	58
Table 5: Problem Type with Criteria for Application .....	87
Table 6: Summary of Results of the Realist Reviews according to C-M-O model.....	91
Table 7: Assessment of Breastfeeding Periods: Germany .....	92
Table 8: Assessment of Breastfeeding Periods: United Kingdom .....	93
Table 9: Assessment of Breastfeeding Periods: Ghana .....	94
Table 10: Interrater Reliability of Screening Process, All Countries .....	95
Table 11: Summary of Social Determinants Identified according to Study and Impact on the Breastfeeding Period.....	97
Table 12: Social Determinants Confirmed by the Realist Review: Germany.....	100
Table 13: Synthesized Results from Germany .....	102
Table 14: Social Determinants Confirmed by the Realist Review: United Kingdom.....	103
Table 15: Synthesized Results from the United Kingdom .....	108
Table 16: Social Determinants Confirmed by the Realist Review: Ghana.....	111
Table 17: Synthesized Results for Ghana .....	116
Table 18: Guideline Appraisals with AGREE II: Germany .....	119
Table 19: Guideline Appraisals with AGREE II: United Kingdom.....	121
Table 20: Guideline Appraisals with AGREE II: Ghana .....	122
Table 21: Assessment of Breastfeeding Periods of All Guidelines .....	124
Table 22: Summary of Guideline Analyses with the BIAS FREE Framework (Burke & Eichler, 2006) .....	126
Table 23: Identified Problem Types and Social Determinants, Clinical Practice Guideline 024/005, Germany.....	127
Table 24: Identified Problem Types and Social Determinants: Guideline for Prevention of Allergies; registry no. 061-016, Germany.....	133

Table 25: Identified Problem Types and Social Determinants: Clinical Guideline CG37 Postnatal Care, United Kingdom ..... 138

Table 26: Identified Problem Types and Social Determinants: Public Health Guideline 11, Maternal and Child Nutrition..... 145

Table 27: Identified Problem Types and Social Determinants: Under Five’s Child Health Policy, Ghana ..... 152

Table 28: Identified Problem Types and Social Determinants: National Guideline for Prevention of Mother to Child Transmission of HIV..... 161

**List of Figures**

*Figure 1: The Socio-Ecological Framework of Breastfeeding* ..... 1

*Figure 2: Under-Five Mortality Rate in 2015 per Country*..... 7

*Figure 3: Breastfeeding Indicators by Country Income Group in 2010* ..... 10

*Figure 4: Connecting Caregiving across the Continuum for Maternal, Newborn and Child Health*..... 20

*Figure 5: Conceptual Model of Determinants of Breastfeeding and Related Interventions*.... 21

*Figure 6: Theoretical Model of the Research* ..... 38

*Figure 7: Model of Generative Causation*..... 42

*Figure 8: Adapted Context-Mechanism-Outcome Model*..... 43

*Figure 9: Search and Screening Process for Germany*..... 62

*Figure 10: Search and Screening Process for the United Kingdom* ..... 65

*Figure 11: Search and Screening Process for Ghana*..... 68

*Figure 12: The BIAS Triangle*..... 83

*Figure 13: Model Depicting the Breastfeeding Continuum in a Health Practice Guideline: Germany*..... 202

*Figure 14: Model Depicting the Breastfeeding Continuum in a Health Practice Guideline: United Kingdom*..... 203

*Figure 15: Model Depicting the Breastfeeding Continuum in a Health Practice Guideline: Ghana*..... 204

## List of Abbreviations

AGREE II	Appraisal of Guidelines for Research and Evaluation tool version II (AGREE II)
ALSPAC	AVON Longitudinal Study of Parents and Children
ANC	Antenatal care
ART	Antiretroviral Therapy
BF	Breastfeeding
BFHI	Baby Friendly Hospital Initiative
BfR	Bundesinstitut für Risikobewertung
BIAS FREE Framework	Building an Integrative Analytical System For Recognising and Eliminating inEquities)
BFI	Baby Friendly Initiative
cont.	continued
d	die (=day)
DHS	Demographic and Health Survey
DVD	Digital Video Disc
EBF	Exclusive Breastfeeding
esp.	Especially
FRG	Federal Republic of Germany
g	gram
GDR	German Democratic Republic
GHDS	Ghana Demographic and Health Survey
GER	Germany
GH	Ghana
GOBI-FFF	Growth monitoring, Oral rehydration therapy for diarrhea, Promotion of breastfeeding, childhood immunization, Family planning and birth spacing, Food supplementation, promotion of Female literacy
h	Hour

HICs	High Income Countries
HIV	Human Immunodeficiency Virus
HSCIC	Health and Social Care Information Centre
HTLV I and II	Human T-cell leukemia-lymphoma virus type I and II
IBFAN	International Baby Food Action Network
IBCLC®	International Board Certified Lactation Consultant
IBLCE®	International Board of Lactation Consultant Examiners®
IEA	International Epidemiological Association
IMD	Index of Multiple Deprivation
incl.	Including
IOM	Institute of Medicine of the National Academies
IR	Interrater Reliability
KiGGS	Kinder-und Jugend Gesundheits Survey
MAS	Multicentric Allergy Study
MCS	Millenium Cohort Study
MDG 4	Millennium Development Goal Nr. 4
MICS	Multiple Indicator Cluster Survey
NGO	Non-Governmental Organization
NHS	National Health System
NHIS	National Health Insurance Scheme
NI	Northern Ireland
NICE	National Institute for Clinical Excellence
No.	number
OC	Obstetric Care
ONS	Office for National Statistics
PC	Postnatal Care
PCBs	Polychlorinated Biphenyls
PINGU	Polyunsaturated Fatty Acid Nutrition Study

PMTCT	Prevention of Mother-to-Child-Transmission
pp	postpartum
RCH clinic	Reproductive Child Health Clinic
RMNCH	Reproductive, maternal, newborn and child health
RKI	Robert Koch-Institute
RMNCH	Reproductive, maternal, newborn and child health
SES	Socioeconomic Status
SIGN	Scottish Intercollegiate Guideline Network
s.s.	Statistically significant
SUN	Scaling-Up Nutrition Initiative
T1D	Type-1 Diabetes Mellitus
TBA	Traditional Birth Attendant
UK	United Kingdom
UN	United Nations
UN IGME	UN Inter-agency Group for Child Mortality Estimation
UNICEF	United Nations Children Fund
US dollar	United States of America Dollar
vs	Versus
WHO	World Health Organization

## **Abstract**

Introduction: Breastfeeding is recognized as an important public health issue with high social and economic implications. According to the WHO, it should be initiated within one hour after birth, exclusive breastfeeding should be practiced for six months, and the entire period should last for two years. However, breastfeeding rates are sub-optimal at a worldwide scale and could be improved. Recommendations are commonly translated into guidelines to be applied in health service delivery. In order to increase the effectiveness of guidelines, these should be adapted to their social and cultural context. The aim of this dissertation therefore was to evaluate whether relevant contextual factors, such as social determinants that affect breastfeeding are addressed in respective guidelines. In order to contrast results, three countries – Germany, the United Kingdom and Ghana – were compared.

Methods: The research was carried out in two steps. First, a Realist Review was conducted. This methodological approach is borrowed from Systematic Reviews, but employs a broader search. It aims at verifying which contextual factors take effect on a certain health outcome in what type of context. For this research, context was defined as the social contexts where breastfeeding takes place, with contextual factors defined as social determinants, and the respective outcomes as breastfeeding periods as recommended by the WHO. Retrieved studies were first subject to an overall quality assessment according to criteria from SIGN. They were then analyzed by Pawson's Realist Synthesis method. For the second step, two guidelines per country were selected. The first referred to the postnatal period itself, and the second to a health risk related to breastfeeding. Guidelines were then appraised for their quality with the AGREE II tool. Thereafter, they were scrutinized with the BIAS FREE Framework, an instrument for detecting social biases.

Results: The search and screening process from the Realist Review resulted in eight studies for Germany, 11 for the United Kingdom and six for Ghana. Findings from the Realist Synthesis revealed that there were clear relationships between social determinants and breastfeeding. For all three countries, young maternal age, a low maternal educational level/SES, as well as social networks proved relevant for all breastfeeding periods. Culture manifested itself differently in the three regions, and was of major importance in the United Kingdom. Work regulation and parental leave in combination with economic constraints were a major challenge to start and continue breastfeeding in the United Kingdom, and led to the interruption of exclusive breastfeeding in Ghana, which is highly problematic in times of HIV. Regarding the guideline analyses, social determinants that were found to be relevant are not taken into account as such. For example, women are addressed as "the mother", ignoring their socio-demographic characteristics, and also neglecting their social reality, e.g. the influence of family members/peers on the infant feeding decision. One-parent families are underrepresented, and quality assurance limited to medical factors only.

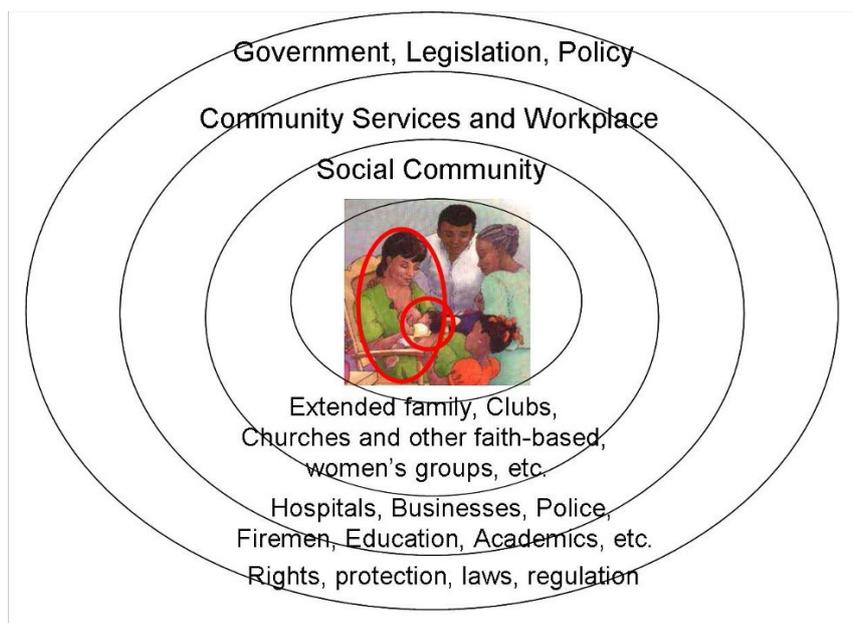
Recommendations: The methodological approach of the Realist Review proves suitable for the aim of this research and is therefore highly recommended. The fact that social determinants are not part of breastfeeding-related guidelines indicates a dearth in guideline development and implies a reduced effectiveness. In order to scale up breastfeeding rates, it is therefore recommended to address them accordingly to enhance effectiveness and thus to achieve health equity in mothers and their children.

# 1 Introduction

The benefits from breastfeeding for both mother and child survival as well as short and long term health are well known and have recently been confirmed (Kramer & Kakuma, 2002; Stuebe, 2009; Krawinkel, 2011; Lawrence & Lawrence, 2011; Horta & Victora, 2013; WHO, 2013a; WHO, 2013b; Victora et al., 2016). Improved breastfeeding practices could save the life of 825,000 children annually by reducing starvation and the burden due to communicable and non-communicable diseases in infants (Victora et al., 2016). Based on these research results the WHO has therefore issued recommendations for breastfeeding (WHO, 2013c). The WHO recommends onset of breastfeeding within one hour after birth, exclusive breastfeeding for six months, and an entire breastfeeding period for two years. This implies that breastfeeding takes place in a continuum in diverse contexts.

However, currently there are strong geographical variations in the adherence to these recommendations and virtually no country displays optimal breastfeeding rates (Victora et al., 2016). In order to enable mothers to breastfeed, there is need for a comprehensive, multi-level, multi-sectoral protection, promotion and support for breastfeeding (Labbok, 2008). This approach is based on four pillars: the national level where policies are launched that allow mothers to breastfeed, e.g. at work, accompanied by a health system that provides breastfeeding support and trained staff, and finally the social environment consisting of the family and the community. Labbok (2008) therefore created the socio-ecological framework of breastfeeding as shown in the following figure:

**Figure 1: The Socio-Ecological Framework of Breastfeeding**



Source: Labbok, 2008

Although breastfeeding is recognized as an important measure for primary prevention in child and adult health and therefore a vital means to implement health equity, there are substantial differences among mothers in regards to breastfeeding patterns influenced by a variety of determinants affecting socially disadvantaged populations disproportionately (Rollins et al., 2016).

It was long believed that health gains as longer life expectancy witnessed in the past century are a result from improved medical services. However, this is not altogether true. It was rather economic development leading to healthier living conditions for a majority of the population that led to substantial improvements in health outcomes in general (Daniels, 2008). To quote Daniels:

“Health is produced not just by having access to medical prevention and treatment but also, to a measurably great extent, by the cumulative experience of social conditions across the life course. [...] Medical care, is, figuratively speaking, the ambulance waiting at the bottom cliff.” (Daniels 2008:79)

According to the Commission of the Social Determinants of Health, approximately 70% of health is achieved outside the health care system. Social determinants are the most determining cause to (ill-) health (CSDH, 2008). They are defined as “non-medical” factors that influence health and refer to the social model of health, which are the conditions and circumstances where people are born, grow-up, live, work and grow old along with the system that provides care for the ill (CSDH, 2008). Society represents a system in which groups of people are divided into layers according to their relative power, property and prestige. These layers and their corresponding hierarchies are not naturally given, but socially constructed, that is produced as well as reproduced by the members of that society. Distribution of resources is divided along these power structures and thus regulates access to resources for those belonging to a certain social group which can then result in inequalities (Marmot & Allen, 2014). Pervasive social inequalities have a negative health impact, which might translate into health inequities (CSDH, 2008; (Marmot & Allen, 2014). Factors such as social determinants known to exacerbate health inequities in infants therefore deserve further attention.

Health equity can only be established by implementing a broader concept of social justice. In order to guarantee that people enjoy the full range of opportunities and provided that normal functioning (a healthy state) is a main prerequisite, it becomes necessary to treat disease when it occurs, but moreover by curtailing the risk of acquiring a disease or disability before its occurrence, and by assuring an equal distribution of those risks (Daniels, 2008). If certain groups within a population suffer from heightened risk levels in comparison to others, then measures to address them in a way that the risk distribution is equalized, need to be taken (Daniels, 2008). This can be applied to breastfeeding, since it is a highly effective way to re-

duce the risk to develop a variety of diseases. Mothers should therefore be enabled to breastfeed their children for the recommended period.

Governments have aimed at reducing health inequities and the need to tackle health determinants exacerbating the health of certain societal groups by addressing them in respective policies (Casas-Zamora & Ibrahim, 2004). Non despite, health recommendations are delivered by different formats with the most common type as the guideline (Brownson et al., 2009). Guidelines are considered to be useful and necessary instruments to assure a high-quality clinical practice (Grimshaw et al., 2004), but also embrace the capacity to address health issues outside the clinical setting and support health policy making (AGREE, 2013). However, concepts of health service delivery are based on theories and models (efficacy). When put into practice, the benefits expected under ideal circumstances are often not achieved due to the fact that under real life conditions there are unexpected factors influencing the outcome of that health service delivery (effectiveness). This difference between efficacy and effectiveness is called “effectiveness gap” (Pfaff & Schrappe, 2011). Due to the varying and complex factors playing a role outside the clinical research setting, an anticipated benefit for the health outcome may not get into effect later in reality and raises a problem with effectiveness. This is the case for measures aiming at health promotion and disease prevention of the population (ibid). Besides, the WHO has emphasized the dearth of guidelines that promote health equity and are appropriate to the cultural and social context (WHO, 2012). The integration of health equity issues in the development of guidelines will enhance their effect when applied in practice (Aldrich et al., 2003; Dans et al., 2007; Acosta et al., 2011; Shi et al., 2014).

Theoretically all mothers are capable of breastfeeding. In order to promote breastfeeding, specific recommendations have been implemented in many countries through the means of guidelines. Non despite, breastfeeding rates and the duration of the breastfeeding periods are not meeting up with the WHO recommendations. One possible explanation could be that respective breastfeeding guidelines are not formulated in a comprehensive way. When a guideline is applied in a specific setting, the social context in which it takes place comes into effect impacting on the expected effectiveness, which in this case can be onset of breastfeeding, period of exclusive breastfeeding and duration of the breastfeeding period as such. Moreover, these different stages are different parts of the healthcare continuum taking place in different settings and thus also require to be adequately considered. Altogether in health services research, these real life aspects are called context-related factors (Pfaff & Schrappe, 2011). Research has proven that social determinants exercise a strong influence on health regarding health status, health behavior and health service (CSDH, 2008; Okechukwu et al., 2014). If not addressed adequately, they can contribute to health inequities.

Therefore, social determinants influencing breastfeeding need to be taken into account during the process of guideline formulation.

For the purpose of this dissertation, the quality and possible social determinants in breastfeeding guidelines from the three countries Germany, the United Kingdom, and Ghana will be analyzed. The decision to opt for these three countries is that each country has implemented breastfeeding recommendations and financial access to maternal care is covered. Most interestingly, they display highly varying breastfeeding rates, and all three countries do not meet with WHO recommendations (2013c). As for contextual factors, the three countries offer a broad range in societal, cultural and political characteristics. Germany is of particular interest because the author is ethnic German and has working experience in that field including the development of a hospital-specific clinical breastfeeding guideline. As for breastfeeding rates, according to a representative survey conducted by the National Public Health Institute, 81% of all babies born in 2003 were breastfed with an average duration for all children for about seven months (Lange et al., 2007) displaying the highest among the three chosen countries. The United Kingdom has been chosen because of its longstanding tradition in developing guidelines and its advanced standards in guideline formulation regarding health equity. The initial breastfeeding rate of newborn children across the United Kingdom was 81% in 2010 and decreased to 2% after six months (UNICEF UK, 2012), which is the lowest of the three countries under research. In order to contrast these two European countries and enrich the findings regarding the social determinants, Ghana was opted for. It is a country with a formal health system having implemented national strategies that address breastfeeding. For Ghana, in 2003 about two thirds of all children were exclusively breastfed until three months of age and half of them until six months of age, but with an average duration of 1,8 years (MoH Ghana, 2009a).

The research question of this dissertation was, whether social determinants that affect breastfeeding are addressed in respective guidelines. Addressing relevant social determinants of health and biases inherent in breastfeeding guidelines can therefore increase the effectiveness of the guidelines. In order to contrast results, the three countries Germany, the United Kingdom and Ghana were studied. For the purpose of this research, the quality and possible social determinants in breastfeeding guidelines from the three countries Germany, the United Kingdom, and Ghana were analyzed accordingly.

The research was carried out in two steps. A Realist Review on the prevailing social determinants of breastfeeding was carried out first. Realist Reviews adhere to the standards of a systematic review, but enhance their scope to a broader range of studies that can be included for the research thus making sure that relevant studies aside from randomized controlled trials will not be omitted (Royal Pharmaceutical Society, 2011). Realist Reviews are specifi-

cally developed for reviews that address complex social interventions thus investigating how contextual factors influence the effectiveness of a given procedure (Pawson et al., 2005).

“It is through the workings of entire systems of social relationships that any changes in behaviours, events and social conditions are effected.” (Pawson, 2006:30). Realist inquiry therefore aims at grasping the context in order to unravel the “[...] different layers of social reality that make up and surround them.” (Pawson, 2006:30).

Therefore, the realist analysis allows an insight into at least four contextual layers: individual capacities, interpersonal relationships, institutional setting and the wider infra-structural system (Pawson, 2006). As for framing the context, there are a lot of possibilities available. In the case of this dissertation, context is therefore defined as the social context where breastfeeding takes place.

The second step that followed was a comprehensive analysis of guidelines with the BIAS FREE Framework (**B**uilding an **I**ntegrative **A**nalytical **S**ystem **F**or **R**ecognising and **E**liminating in**E**quities), a practical tool for identifying and eliminating social biases in health research (Burke & Eichler, 2006). The tool sets out to specifically analyze the language of power and social inequality in order to identify and avoid biases that are the result of sexism, racism, ableism and other social hierarchies (ibid). It works in a way that it identifies “privileging” biases from one hierarchy over those from another and offers possibilities for bias-free reformulation. It is specifically designed to identify social biases in the different phases of the health research process, and its framework is applicable to research, legislation, policies, programs and practices (Burke & Eichler, 2006). It was therefore considered as the appropriate tool to answer the research question. The tool was used for scrutinizing guidelines pertinent to breastfeeding to determine in what way they were biased in regards to the inclusion of social determinants that affect breastfeeding.

It was anticipated that for all three countries social determinants that are relevant for breastfeeding would be identified including maternal age, maternal educational level, social networks and policies that regulate breastfeeding and parental leave in different social contexts. Naturally, it was presumed that these social contexts embrace the birth and the home environment, and additionally in the view of the recommendation to breastfeed for up to two years (WHO, 2013c) potentially the public and the workplace. As for the guideline analyses the author did not expect that relevant social determinants would be addressed accordingly, less in regards to the recommended breastfeeding periods (WHO, 2013c).

Summarizing, there is a dearth in current guideline formulation in regards to taking into account relevant aspects of health equity. In order to increase the effectiveness of guidelines and to scale up breastfeeding rates in combination with corresponding periods, relevant so-

cial factors taking effect in respective social contexts should be adequately considered during guideline formulation.

## 2 Background

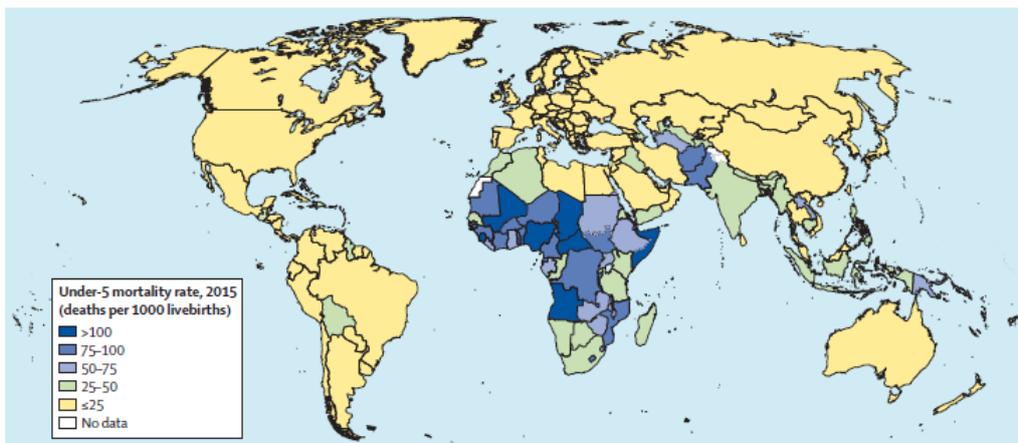
Breastfeeding is the most genuine way to ensure the survival of a newborn and has substantial short and long term health benefits for both mother and child. It can therefore be considered as a means of early primary prevention to ensure a long and healthy life for the child (Krawinkel, 2011). However, the health impact of breastfeeding varies according to the most prevalent diseases and health problems in the different regions of the world.

In this chapter, the global child health situation will be described, followed by a delineation of trends, health impacts and determinants of breastfeeding on both mother and child, and then a discussion on how to positively influence these determinants by elaborating appropriate instruments for health practice, such as guidelines, in order to enhance health equity.

### 2.1 Global Child Health

The Millennium Development Goal no. 4 (MDG 4) agreed upon in 2000, envisioned to reduce the rate of children dying before age 5 by two thirds with the UN Inter-agency Group for Child Mortality Estimation (UN IGME) becoming responsible to take stock (WHO, 2015a). According to their estimates, in 2015 the number of children dying before they reached their fifth birthday has been halved since 1990 to roughly 6 million per year worldwide, with a decrease in the under-five mortality rate of 91 deaths in 1000 live births in 1990 to 43 in 2015 (WHO 2015a; UNICEF, 2015). The under-five mortality rate is defined as the number of children dying before age five per 1000 live births. Of the 62 countries that reached MDG 4 by 2015, there were 24 low and middle income countries mainly situated in East Asia, the Pacific as well as Latin America and the Caribbean (WHO 2015a; United Nations Children's Fund, 2015). The following map demonstrates the under-5 mortality rate by country (WHO, 2015a):

**Figure 2: Under-Five Mortality Rate in 2015 per Country**



Source: WHO, 2015a

The progress in the decline of deaths in children under five was reversed in Sub-Saharan Africa in 1990 after the spread of the HIV crisis (WHO 2015a; United Nations Children's Fund, 2015).

In general, numbers remain high. This is mainly attributable to causes in the neonatal period. The neonatal period starts at birth and lasts until the first 28 days of life of the newborn. The high death toll in newborns is caused by low birth weight in approximately 80% of cases. It is estimated that about one quarter to one half of all newborn deaths occur during the first 24 hours after birth, and three quarters during the first seven days. As a consequence, less progress has been achieved in the decrease of neonatal mortality compared to post-neonatal mortality, from 47% as to 58%.

Around 75% of all deaths that occurred in children before reaching their fifth birthday occurred in their first year of life, the infant period (WHO, 2013b). The infant period ranges from birth until the first year of life (WHO, 2013b). Main causes of infant deaths are pneumonia (17%), preterm birth complications (16%), neonatal intra-partum-related complications (11%), diarrhea (8%), neonatal sepsis (7%) and malaria (5%) (UNICEF, 2015). The reasons for deaths in the post-neonatal period until five are the same regarding communicable diseases except those caused by neonatal conditions, and roughly half of them are a cause of under-nutrition (ibid). According to the UN IGME estimation, a majority of the reasons for children dying below the age of five could be prevented and/or treated by evidence-based and cost-effective interventions, such as optimized breastfeeding (United Nations Children's Fund, 2015). Though these numbers stated here have to be considered with caution because of data quality, child mortality rates are unacceptably high (ibid). According to Victora et al. (2016), improved breastfeeding practices could avert the death of 825,000 children in low and middle income countries annually, and the health of children in high income countries would substantially benefit from them.

## **2.2 Definitions and Trends of Breastfeeding**

According to the WHO (2008), breastfeeding is an essential component of reproductive health. It is defined as feeding a newborn/child with breast milk and divided into different types: exclusive, predominant/full and partial breastfeeding. Besides, infants can be fed on the basis of breast milk substitutes – formula - which is also referred to as artificial feeding. Exclusive breastfeeding means that a child is solely nourished on the basis of its mother's or a wet nurse's breast milk except oral rehydration liquids and drops/liquids containing essential vitamins/minerals or a remedy. Breast milk can be received directly from the mother or expressed and then fed. Predominant or mixed feeding refers to nursing the child mainly with breast milk, and eventually with water and/or tea. Lastly, partial feeding is where breast milk is not the main component of the diet. Full breastfeeding entails exclusive and predominant

breastfeeding (ibid). Another nutrition type is supplementary feeding that refers to feeding the infant other liquids, mainly formula, e.g. if breastfeeding is not sufficient, and complementary feeding when semi-solids and/or solids are introduced into the infant's diet (UNICEF, 2011). The process of breast milk production is termed lactation (Lawrence & Lawrence, 2011).

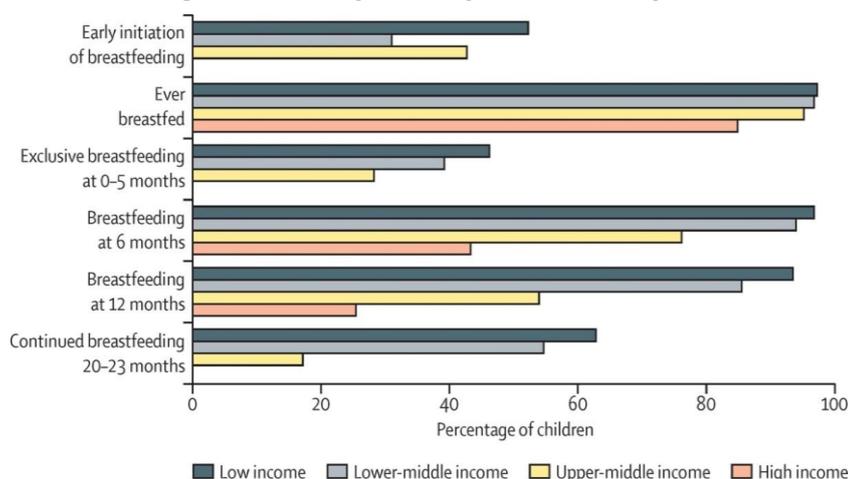
The breastfeeding period is divided into start/onset, period of exclusive breastfeeding, the time when complementary foods are introduced alongside with breastfeeding, and weaning (Lawrence & Lawrence, 2011). Each period signifies its own importance for a child's health. Breastfeeding optimally starts within one hour after birth and exclusive breastfeeding should be practiced for the duration of six months followed by gradual introduction of complementary food and thus continued to up to 24 months (WHO, 2013c). Basis for the WHO recommendations are two systematic reviews (Kramer & Kakuma, 2002; Horta & Victora, 2013). However, the Cochrane Review from 2012 conducted by Kramer and Kakuma yielded controversial results as to the optimal duration of exclusive breastfeeding and its effect on allergy prevention (Kramer & Kakuma, 2012). The WHO therefore explicitly reaffirmed that their recommendations need to be adapted to each country's burden of child mortality. As for countries affected by the HIV crisis, the WHO issued guidelines for the prevention of mother to child transmission (PMTCT) during breastfeeding (WHO, 2010). In order to promote child health, many governments have implemented breastfeeding policies and/or guidelines.

In summary, breastfeeding recommendations are defined as follows (WHO, 2013c):

- Start: within first hour after birth
- Exclusive breastfeeding: Six months exclusively feeding of breast milk except oral rehydration liquids and drops/liquids containing essential vitamins/minerals or a remedy
- Entire length: After six months gradual introduction of complementary food; then continuation up to two years (e.g. mornings and evenings)

The following figure displays current trends of breastfeeding by income groups.

**Figure 3: Breastfeeding Indicators by Country Income Group in 2010**



**Source: Victora et al., 2016**

The 12-months prevalence for breastfeeding is highest in Sub-Saharan Africa, followed by South Asia, and some regions in Latin America (Victora et al., 2016). Thus, low income countries display the longest breastfeeding rates, but not for early onset and exclusive breastfeeding. In low and middle income countries poor women are more likely to breastfeed compared to affluent mothers (ibid). In general, there is a trend towards a decline of all breastfeeding periods with rising national wealth indices besides early onset. However, this result has to be handled with caution since breastfeeding measures were not highly correlated at the country level. Victora et al. (2016) affirmed that the biggest challenge to conduct the meta-analysis was the comparability of breastfeeding measures, mainly the differences in applying the respective nomenclature as well as in the categorization of breastfeeding indicators.

### 2.3 Breastfeeding and Benefits for Child Health

The beneficial effects of breastfeeding regarding morbidity as well as mortality in infants and children under-five are well known (WHO, 2013a; WHO, 2013b; Victora et al., 2016).

Early onset is vital (optimally within the first hour after birth) in order for the newborn to receive the colostrum, the breast milk produced during pregnancy containing essential proteins that function as the immune system in the newborn (Lawrence & Lawrence, 2011). A study conducted in Ghana in 2006 provided evidence that breastfeeding within hours after birth lowered neonatal mortality for 22%, as well as within the 24 first hours for 16%, and in Nepal 19.1% when breastfeeding was initiated within the first hour after birth, and 7.7% during the first day (UNICEF, 2011). These findings were confirmed by a secondary data analysis performed for 62 low and middle income countries by Boccolini et al. (2013). They proved that onset of breastfeeding within the first hour clearly lowered the number of neonatal deaths,

which was more pronounced in countries that have an elevated neonatal mortality rate of 29/1000 live births. It is therefore essential for the newborn's survival that breastfeeding starts within the first hour post-delivery, among other interventions (WHO, 2016b).

Results from the meta-analysis conducted by Victora et al. (2016) revealed that infants exclusively breastfed for six months had a reduced risk of 12% to die during that period as opposed to those who were not breastfed (Victora et al., 2016). Boys below the age of six months were 3.5 times more likely and girls of the same age 4.1 times to die if they did not receive any breast milk in comparison to those who did, though the protective effect on mortality declined with increasing age. This confirms other findings that receiving any breast milk in children belonging to the age group of 6 - 23 months halved mortality (ibid). In high income countries, it is very likely that breastfeeding also protects against sudden infant death syndrome, where it led to a reduction of a third in all cases. As for necrotizing enterocolitis, a severe condition associated with high lethality, breastfeeding decreased deaths by 58% (Victora et al., 2016).

Regarding morbidity, evidence mainly from low and middle income countries proves that breastfeeding protects against diarrhea in half of the events and 30% respiratory diseases, leading to a reduction in hospitalization of up to 72% in the first and 57% in the second case (ibid). Regarding high income countries (HICs), breastfeeding is protective against otitis media until the age of two (Stuebe, 2009; Victora et al., 2016). However, atopic diseases in infants constitute the major burden of diseases in the industrialized countries (Brew et al., 2012). The optimal duration of exclusive breastfeeding to prevent allergic diseases in children has been a topic for a highly controversial debate (Flohr et al., 2011) and no clear evidence could be added to clarify in the latest meta-analysis of Victora et al. (2016). There was no association found between breastfeeding and the development of eczema and food allergies, and only a small protective effect for allergic rhinitis, and a 5% reduction in asthma (ibid). According to reports from the Robert Koch-Institute, there seems to be a strong genetic association, and boys have more allergic events during childhood than girls, but this trend is reversed in adulthood (Schlaud et al., 2007; Schmitz et al., 2014).

Regarding oral health, breastfeeding reduced malocclusions up to 68%, but more than one year of breastfeeding at night posed a risk factor for dental caries in deciduous teeth, which could be amended by cleaning (Victora et al., 2016).

As for the other health topic of major importance in high income countries, prolonged breastfeeding was related to approximately one fourth less cases of overweight and obesity, independent of level of income (ibid). As for the development of diabetes type 2, a decrease in new cases up to 35% was confirmed, but a protective effect for systolic and diastolic blood pressure was not supported from former systematic reviews, neither for total cholesterol (Vic-

tora et al., 2016). Interestingly, the positive relationship between breastfeeding and intelligence was repeatedly corroborated, and finally a decrease of childhood leukemia of almost one fifth (ibid).

## **2.4 Breastfeeding and its Effects on Maternal Health**

Onset of breastfeeding within one hour after birth has a positive impact on maternal morbidity and mortality because it instigates oxytocin, a hormone that supports the contraction of the uterus and thus contributes to reducing delivery-associated blood loss preventing anemia or hemorrhage in the worst case (PAHO, 2007). Regarding lactational amenorrhea, extended periods of exclusive and/or predominant breastfeeding are known to be effective as a natural method of contraception used for spacing of births (Victora et al., 2016). There is strong evidence of the protective effect of prolonged breastfeeding on the development of breast and ovarian cancer. As for diabetes type 2, breastfeeding is highly protective, but this finding could not be confirmed for overweight and obesity. Finally, breastfeeding seems to be protective against maternal depression, but according to the authors, it is more likely that the cause and effect are reverse indicating that depressed mothers are less likely to start breastfeeding (ibid). It is important to note that most studies relating to the effects of breastfeeding on the health of the mother were conducted in high income countries. As for psycho-social factors, the recommended length of breastfeeding for up to 24 months may interfere with the mother's role in regards to employment and/or a strive for independence (Brandt, 2012).

## **2.5 Major Health Risks Transmitted through Breast Milk**

There has been an ongoing debate whether breastfeeding can cause negative health impacts. According to the International Lactation Consultant Association (ILCA, 2001), the discussion has mainly focused on environmental pollutants, such as dioxins, persistent organic pollutants and polychlorinated biphenyls (PCBs) as well as heavy metals, which are introduced into the environment through industrialization. Women who have breastfed their children have lower levels in PCBs than those who did not (Mori & Todaka, 2011). This implies that the environmental pollutant is passed on to the newborn confirmed by the fact that children who are breastfed show higher levels of fat-soluble pollutants than those who were not, e.g. as in the children-environment survey conducted from 2003–2006 in 150 sites in Germany by the Federal Environmental Agency (UBA, 2008). The level of excretion of PCBs through breastfeeding seems to be determined by the mother's type of metabolism (Mori & Todaka, 2011). Besides, PCBs are fat-soluble agents that tend to accumulate with age (Ochsmann, 2007; Mori & Todaka, 2011; UBA, 2008). The procedure of setting PCBs free in the maternal body and passing it to the nursed infant via breast milk is limited to the first months of the breastfeeding period (Mori & Todaka, 2011).

Results from animal trials clearly proved a carcinogenic effect as well as an immuno-, neuro- and reproductive toxicological impact of PCBs, but disease causality in humans has been difficult to establish (Ochsmann, 2007). Finally, it has also been discussed for its role in regards to a relationship in the increase in attention-deficit associated diseases (Mori & Toda-ka, 2011). Ironically, there is a benefit for the mother's health due to the fact that breastfeeding is one the few ways to excrete PCBs (ibid).

Other contaminants of organic nature transmitted via breastfeeding are natural, fungal contaminants (Shuaib et al., 2012). A comparative study conducted in Ghana and Nigeria proved elevated levels of aflatoxins in breast milk. They are food-related fungi growing under moist conditions and lack of refrigeration and can cause adverse birth outcomes in neonates and liver cancer/cirrhosis in adults (Shuaib et al., 2009; Shuaib et al., 2012). Results demonstrated that serum levels of aflatoxins in breast milk were rising according to level of deprivation. The most influencing factor was the economic situation of the women and the question whether she could afford a home-based cooling system for storage of food items (Shuaib et al., 2012).

Another hazardous agent that can be transmitted via breast milk is the Human Immunodeficiency Virus (HIV), with a possibility ranging from 15 – 30% on average and up to 45% for prolonged breastfeeding (WHO, 2010).

The health risks incurred through breastfeeding presented here is not exhaustive, but relevant for the countries that were researched.

## **2.6 Factors Impeding and/or Inhibiting Breastfeeding**

The following table provides an overview of medical factors if a condition in the mother does not allow nursing her child with breast milk (Lawrence & Lawrence, 2011, UNICEF UK, 2012).

**Table 1: Maternal Medical Conditions Affecting Breastfeeding**

<b>Maternal conditions</b>	<b>Breastfeeding yes/no</b>
HIV	Variable
Hepatitis C	Yes
Herpes simplex	Yes
Antimetabolites	Variable/No
Therapeutic dose	No
Drugs of abuse	No
Other medications	Yes

*Sources: Lawrence & Lawrence, 2010; UNICEF UK, 2012*

For high income countries, mothers that are HIV positive should not breastfed (Lawrence & Lawrence, 2010; UNICEF UK, 2012). The risk for a child to die because of a lower respiratory or diarrheal disease is outweighed by the risk to acquire an HIV infection (ibid). Mixed feeding (interchanging breastfeeding with bottle-feeding) bears the highest risk. This is due to the fact that the infant gets confused about how to suckle that can lead to cracked teats (Blumental et al., 2014). Through the injury the likeliness for the child to get exposed to blood is high leading to a substantially increased risk for the transmission of HIV. However, in 2009 the WHO released the recommendation for low and middle income countries to exclusively breastfeed by all means as long as the mother and/or the infant receive antiretroviral treatment during the period of breastfeeding and up to the infant's age of 12 months because of the protective effects of breast milk against communicable diseases (WHO, 2010).

In case of breastfeeding management, major obstacles occur when establishing lactation, latch problems, and for the continuation of the breastfeeding period, breast pain. However, it remains unclear whether this is due to an infection (candidiasis, bacteria) or other reasons (ibid).

The subsequent table indicates the problems on the infant's side to successfully breastfeed.

**Table 2: Infant’s Medical Conditions Affecting Breastfeeding**

<b>Medical condition of infant</b>	<b>Consequence for breastfeeding ability</b>
Premature infants aged less than 37 weeks of gestation	Inability to suck
Infant suffers from galactosaemia	Inability to digest human milk
Disabled child	Possible inability to suck
Oral anatomical abnormalities (cleft lip/palate, macroglossia, micrognathia, tight frenulum/ ankyloglossia with trained medical assessment)	Possible inability to suck
Hypoglycemia, infection, jaundice, respiratory distress	Possible inability to suck
Genetic syndromes, hypertonia, hypotonia	Possible inability to suck
Persistently sleepy infant	Possible inability to suck

*Sources: Lawrence & Lawrence, 2010; UNICEF UK, 2012; Evans et al., 2014*

## **2.7 History of Infant Formula Feeding**

Patterns of breastfeeding have changed over time and according to the historical context. During industrialization in Europe people started to move from rural to urban areas (Dykes, 2006). At the same time, hospital-based care evolved and became of interest because of providing a potentially safe place for birth and an opportunity to rest for a woman from her domestic and other duties. Simultaneously, at the end of the 19<sup>th</sup> century, the production of infant formula had started as an answer to process the surplus of products from the commercialized milk cattle industry. Infant formula seemed a viable option to feed infants. The image of the modern mother was created, who could lead an independent life free from breastfeeding, but fulfilling her reproductive role at the same time. During that time, the government in the United Kingdom implemented child health monitoring with an emphasis on nutrition and targeting the poor who suffered from higher infant mortality rates, distributing free samples of bottled infant formula (ibid). Aggressive commercial practices including on maternity wards let people believe that breast milk substitutes were healthier for infant and a relief for the mother, who was able to share infant feeding with her husband and moreover could always control her baby’s exact intake of nutrients (Dykes, 2006). Over the course of the 20<sup>th</sup> century, in industrialized countries hospital delivery became the norm with a negative impact on

breastfeeding due to successful marketing of formula (Dykes, 2006). Moreover, breastfeeding was viewed as a practice of the poor who could not afford breast milk substitutes (Rollins et al., 2016).

In 1984, the American Academy of Pediatrics claimed in their statement on the benefits of breastfeeding that “if there are benefits associated with breastfeeding in populations with good sanitation, nutrition and medical care, the benefits are apparently modest.” (Victora et al., 2016: 475).

## **2.8 Strategies to Promote Breastfeeding**

During the course of the 20<sup>th</sup> century, infant mortality rates remained high in low- and middle income countries, whereby infant mortality is measured through deaths of infants in their first year per 1000 live births (Victora et al., 2016). In 1982, the comprehensive health strategy GOBI was introduced, standing for growth monitoring, oral rehydration therapy for diarrhea, the promotion of breastfeeding and childhood immunizations. Three components were added later in GOBI-FFF: family planning and birth spacing, food supplementation and the promotion of female literacy (Werner & Sanders, 1997). However, GOBI was not implemented in its original, but as a reduced version emphasizing on oral-rehydration therapy and child vaccinations only. The reduced programs were successful on the short run, but did not sustainably reduce child mortality rates (ibid). They were, therefore, questioned later for their focus on health as the absence of disease neglecting the living conditions that create and sustain or deteriorate health in the first case. Besides, there have been rumors that breastfeeding was not at the focus because the formula producing industry was entering the global market at that time (ibid). Despite all efforts to control the commercialization of breast milk substitutes, in 2014 infant formula products worth 44.8 billion US dollar were sold worldwide and are estimated to reach 70.6 billion US dollars in 2019 (Rollins et al., 2016).

Over the course of the years, there have been a lot of efforts to promote breastfeeding. The most important international, non-governmental organization founded in 1956 by seven mothers in the USA is the La Leche League, which offers peer-counselling from breastfeeding mothers to support women who want to nurse their offspring successfully (La Leche League International, 2016). Aside of voluntary breastfeeding counselling offered by non-governmental organizations, there has been a professionalization for maternal health service providers. In 1985, the La Leche League helped to set up the International Board of Lactation Consultant Examiners® (IBLCE®) that became responsible to formulate and implement standards for breastfeeding counselling (IBLCE®, 2016). At the beginning of 2016, around 28,000 IBCLCs were active worldwide (IBLCE®, 2016). They work as employees in hospital care, but can also work as independent consultants.

In 1979, the International Baby Food Action Network (IBFAN) was founded after a meeting of WHO and UNICEF discussing nutrition of infants and young children (IBFAN, 2016). It aimed at promoting breastfeeding in order to enhance infant health, and successfully advocated for the restriction of marketing breastmilk substitutes. As a consequence, the WHO passed the “International Code of Marketing Breastmilk Substitutes” in 1981 (WHO, 1981). This Code entailed ten recommendations on how to handle the marketing of infant formulas, like no commercials in public, no free samples of any type of breast milk substitutes during the hospital stay, and no breastfeeding counselling carried out by staff employed by the respective companies, as well as no gifts for the staff employed in the hospitals, among others. Moreover, WHO and UNICEF developed, in a joint venture project, a “manual” on how to protect, promote and support breastfeeding with a focus on health services (WHO, 1989). It contains the “Ten Steps to Successful Breastfeeding” (WHO, 1989: 4):

1. Have a written breastfeeding policy that is routinely communicated to all healthcare staff.
2. Train all healthcare staff in skills necessary to implement this policy.
3. Inform all pregnant women about the benefits and management of breastfeeding.
4. Help mothers initiate breastfeeding within half an hour of birth.
5. Show mothers how to breastfeed, and how to maintain lactation even if they have to be separated from their infants.
6. Give newborn infants no food or drink other than breastmilk, unless medically indicated.
7. Practise rooming-in - that is, allow mothers and infants to remain together - 24 hours a day.
8. Encourage breastfeeding on demand.
9. Give no artificial teats or pacifiers (also called dummies or soothers) to breastfeeding infants.
10. Foster the establishment of breastfeeding support groups and refer mothers to them on discharge from the hospital or clinic.

It is important to add that the above mentioned recommendations are the result of expert opinions (WHO, 1989), but not evidence-based, and basically focus on breastfeeding management and adequate training of staff.

In 1990, the Innocenti Declaration followed (the name was borrowed from the place where the meeting was held, the Spedale degli Innocenti, Florence, Italy) protecting and promoting breastfeeding with the goal that the International Code should be implemented in 1995 by all

governments (WHO, 1990). One core element was goal no. 2 that addressed the need to implement the “Ten Steps to Successful Breastfeeding”. In order to implement them successfully into reproductive health service delivery, the WHO/UNICEF Baby Friendly Hospital Initiative (BFHI) was launched (ibid), and has implemented 20,000 baby-friendly hospitals in 150 countries (Europäisches Zentrum für Laktation und Stillen, 2016). Out of these, 500 are located in industrial nations. In 2005, at its 15<sup>th</sup> anniversary, another assembly was held at the same place, renewing the declaration from 1995 and adding new components, such as implementation and monitoring of a breastfeeding related policy, and an inter-sectoral approach to promote and protect exclusive breastfeeding thus enabling a breastfeeding period of two years (UNICEF, 2005).

The PROBIT study, a multicentre, cluster-randomized controlled trial in Belarus, tested for the effect of breastfeeding promotion according to BFHI certification criteria, and proved that after three months the chance for infants to be exclusively breastfed was seven-fold and to be fully breastfed twofold for those participating in the intervention compared to the control group respectively (Patel et al., 2013). However, after six months almost 8% compared to 0.6% were still exclusively breastfed and around 11% as compared to 1.6% were breastfed at all (ibid). The sustaining effect of the BFHI on exclusive breastfeeding and breastfeeding has to be proved still.

In Dublin in 2004, there was a European agreement on a Breastfeeding campaign named “Protection, promotion and support of breastfeeding in Europe: a blueprint for action.” In 2006, the “Ten Steps to Successful Breastfeeding” were revised, and step 10 addressing support after leaving the hospital was acknowledged to be the most challenging and ineffective part (UNICEF & WHO, 2006). The concept of post-clinical support was therefore expanded to breastfeeding friendly communities (Labbok, 2008). The latest initiative that was launched by IBFAN in 2007 was the World Breastfeeding Trends Initiative to monitor and document actual breastfeeding activities at country-level (WBTi, 2014).

Besides the activities mentioned above, UNICEF issues the “Programming Guide on Infant and Young Child Feeding” on a regular basis emphasizing the need to support, implement and enable breastfeeding (UNICEF, 2011). The latest government initiative was launched in 2010 as a combined action of the Bill & Melinda Gates Foundation, the government of Japan and the World Bank under the auspice of UNICEF – the Scaling-Up Nutrition Initiative, also called the SUN movement, to end hunger and malnutrition of children in low and middle income countries (UNICEF, 2016).

Lastly, the UN Secretary General Ban Ki-moon initiated the Global Strategy for Women's and Children's Health in 2010 that instilled the “Every Woman Every Child” movement and the Lancet Special Issue on breastfeeding published in January, 2016, that includes the latest

evidence on the benefits for health and society of breastfeeding (Every Woman Every Child, 2015). Due to the necessity to formulate new goals after having reached 2015, Every Woman and Every Child issued the Global Strategy for Women's, Children's and Adolescents' Health 2016-2030 (Every Woman Every Child, 2015; Rollins et al., 2016; Victora et al., 2016). This publication serves as the background document for Sustainable Development Goal 3: Ensure healthy lives and promote well-being for all at all ages and by 2030, end preventable deaths of newborn and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1,000 live births and under-5 mortality to at least as low as 25 per 1,000 live births (UN, 2015). As a consequence, the WHO launched the 1000 days' initiative, which aims at increasing the rate of exclusive breastfeeding for six months to 50%, hereby emphasizing among others, that lawmakers should issue and implement policies that provide for a paid maternal leave for six months and for the possibility to breastfeed at workplace and in public (WHO, 2015b).

However, despite all the efforts so far regarding the promotion of breastfeeding, no country currently meets recommended periods by WHO (Victora et al., 2016).

## 2.9 Contexts of Breastfeeding: The Care Continuum

The World Health Report from 2005 'Make every mother and child count' emphasized that in order to reduce maternal and child morbidity as well as mortality, women in their reproductive span require continued care (WHO, 2005).

"Mothers and children need a continuum of care from pre-pregnancy, through pregnancy and childbirth, to the early days and years of life." (WHO, 2005, cited in CSDH 2008:3). It acknowledges the fact that a safe delivery is vital for the health of mother and child, and thus a productive life. The concept called "Continuum of Care" aims at delivering integrated services by institutions of the healthcare system, families and communities for mothers and their children starting before conception up to birth, and the immediate postnatal period followed by infancy. There are two dimensions entailed in the "Continuum of Care", 'time', relating to the reproductive period, outlined above, and 'place', referring to the different levels of delivered care, which need to be connected to achieve optimal results. Figure 4 visualizes the Continuum of Care to enhance maternal, newborn and child health.

*Figure 4: Connecting Caregiving across the Continuum for Maternal, Newborn and Child Health*



PMNCH (2011). Adapted from WHO (2005) - Make every mother and child count.

**Source: PMNCH Fact Sheet: RMNCH Continuum of care (2011)**

This concept can be applied to one element of it, breastfeeding, with time relating to the onset of breastfeeding within one hour after birth, a period of exclusive breastfeeding for six months and a complete breastfeeding period of two years. Regarding place, breastfeeding starts at the birth place, in any case continues at home and in the community subsequently. However, the latter one is a rather ambiguous term. The author therefore decided to relate to the social context where breastfeeding takes place, which then would embrace the places mentioned above, but also the public and the workplace. The breastfeeding continuum there-

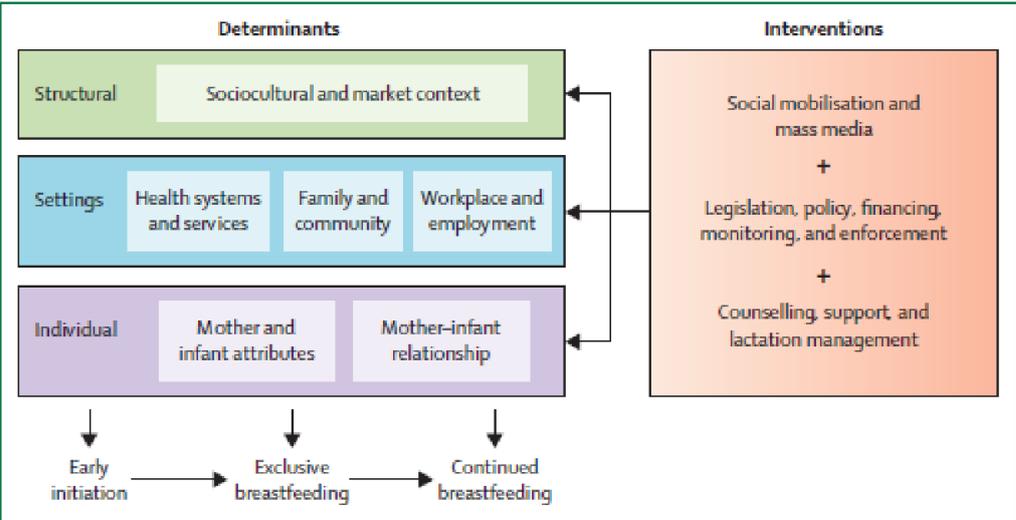
fore is operationalized in a) the different breastfeeding periods and b) in the different social contexts where it takes place. This was then translated to the breastfeeding periods recommended by WHO (2013c) starting optimally within the first hour after birth and ending at approximately after two years. This implies that a breastfeeding continuum occurs in a variety of social contexts, starting at the birthplace, continuing at home, and then at other sites like the workplace and in public with the breastfeeding mother and her breastfed child exposed to diverse influences.

**2.10 Determinants of Breastfeeding**

The prevailing norms, view and traditions in regards to breastfeeding have changed over time (Rollins et al., 2016). Therefore, it is important to note that this dissertation researches conditions for and breastfeeding behaviors at present.

Rollins et al. (2016) conducted a systematic review on the determinants of breastfeeding and corresponding conceptual models as well effective interventions in regards to breastfeeding. They identified influencing factors on women's infant feeding decisions and their respective behavior, and allocated them according to the three levels that structure a society, individual (mothers and infant attributes as well as relationships), relevant settings for breastfeeding (health systems and services, family and community, workplace and employment) and finally structural (socio-cultural and market context). They constitute the framework for breastfeeding in respect to early initiation within one hour after birth, exclusive breastfeeding for the first five months, continued for 12-23 months and any breastfeeding up to six months as demonstrated in the following figure.

**Figure 5: Conceptual Model of Determinants of Breastfeeding and Related Interventions**



Source: Rollins et al., 2016

At the structural level, the socio-cultural context is important because of its normative effect regarding attitudes towards breastfeeding, followed by market factors where authors state, as an example, that employers and colleagues may not agree that a woman breastfeeds at the workplace (ibid).

Regarding the settings level, health systems and services play a vital role in breastfeeding success at the very start. In western countries, the health system is the first contact point of mother and child after birth and thus a sensitive period to external influences (Dykes, 2006). The length of stay in a hospital is inversely related with breastfeeding success (Dykes, 2006; Patel et al., 2013; Rollins et al., 2016). Health professionals providing health services exercise a major influence in this situation, as in antenatal care when the decision to breastfeed or not is possibly not finalized yet, and after birth during the postnatal period (Dykes, 2006; Rollins et al., 2016). Skills and capacities of those who deliver maternal health services are not adequate (Lawrence, 2014; Rollins et al., 2016). This is one aspect caused by hospital routine where the hospital appears as a hubbub (Lawrence, 2014) as well as attributable to the fact that maternity care is not very valued in health care systems that are oriented towards medical technologies, resulting in chronic understaffing and thus lack of sufficient time to attend the mother and child (Dykes, 2006). “Postnatal care is the Cinderella of maternity services” (Dykes, 2006: 74). Practices common in hospitals like post-lacteal feedings or supplementary feedings negatively influence onset of and sustained continuation of lactation in mothers (Springer, 1997; Dykes, 2006; Rollins et al., 2016). In countries where home births are still common, prelacteal feedings are practiced more often (Rollins et al., 2016).

Besides, the fact that the mother is separated from her usual social environment and lack of family and peer-support of the mother in that sensitive period needs also to be taken into account (Kroth, 1998; Dykes, 2006). However, the attitudes towards breastfeeding of the child's father, the grandmothers and peers such as friends exercise a high influence on the infant feeding decision of the mother (Kroth, 1998; Lawrence & Lawrence, 2011; Aryeetey & Goh, 2013).

Another challenge arises due to the “imperative to work and breastfeed” (Dykes, 2006: 43) for women across all societies in a globalized world. Adequate parental leave policies and workplace regulations could strongly mitigate these effects (Rollins et al., 2016; UNICEF, 2016).

At the individual level, the intention to breastfeed in a favorable environment strongly determines subsequent breastfeeding behavior, and is commonly finalized in the third trimester (Rollins et al., 2016). Other factors that may impair breastfeeding success can be smoking during pregnancy and after birth, overweight and obesity, maternal depression, and assisted delivery (Rollins et al., 2016). Problems with breastfeeding management and lack of appro-

ropriate support also account for unsuccessful breastfeeding (Dykes, 2006; Rollins et al., 2016).

Though country variations exist, there is a common overall pattern: culture in the sense of shared expectations regarding breastfeeding behavior in a given society, as well as convictions and opinions are main determinants regarding breastfeeding (Dykes, 2006; Rollins, 2016), whereby socioeconomic status (SES) of the mother influences her attitudes as well as her health behavior (Aidam et al., 2005). One indicator of SES, maternal education, is well-researched (Senarath et al., 2012). Studies from different countries such as Germany, the United Kingdom, India, Nigeria and Ghana have shown that the higher the level of maternal education, the higher as well as longer are breastfeeding rates throughout countries (Lange et al., 2007; Hwang et al., 2006; Agho et al., 2011; Aryeetey & Goh, 2013).

In countries that were affected by the HIV crisis, breastfeeding has deteriorated despite evidence that exclusive breastfeeding significantly embraces a reduced the risk for transmission of the disease and prevents against other infectious agents often prevalent in these regions (MoH Ghana, 2008; Lawrence & Lawrence, 2011; Rollins et al., 2016).

## **2.11 Social Determinants of Health**

The term 'social determinant of health' itself was introduced by Tarlov in 1996, who for the first time elaborated a comprehensive definition (Tarlov, 1996).

He distinguished four “[...] determinants of health of a population: genes and biology, medical care, health-related behaviors as nutrition [...]; and the social characteristics within which living takes place. (Tarlov 1996: 72) Moreover he argues that “[...] many of the behavioural risk factors have aetiological roots in the social environment.” (Tarlov 1996: 75). The “[...] production of health accounts for differential vulnerability to disease according to the social hierarchy.” (Tarlov 1996: 71).

It has become common knowledge that a person's susceptibility to disease depends on more than her or his behavior as an individual. It crucially depends on the social environment within which a person leads her or his life (Marmot & Wilkinson, 1999; Wilkinson & Marmot, 2003; CSDH, 2008). According to the International Epidemiological Association health inequalities are defined as the virtually universal phenomenon of variation in health indicators between certain groups of society (IEA, 2014). They are partly a result from biological differences or behavioral decisions, but also social and living conditions which cannot necessarily be influenced by them.

“In the latter case, they may be unnecessary and avoidable as well as unjust and unfair, and cause or reflect health inequity.” (IEA, 2014: 130). Braveman and Gruskin (2003) defined equity in health as “[...] the absence of socially unjust or unfair health disparities.”

Whitehead (1991), the “founder” of the concepts of health equality and health equity, stated that health inequalities can be regarded as health inequities when they entail these three characteristics: unfair, unnecessary and avoidable conditions that lead to the above mentioned variations in health outcomes.

“For the purpose of operationalization and measurement, equity in health can be defined as the absence of [...] the major social determinants of health between social groups who have different levels of underlying social advantage/disadvantage [...]” (Braveman & Gruskin 2003: 254)

Health inequalities are the result of systematically disadvantaging groups by privileging socially dominant ones in a given society. Belonging to either the socially advantaged or disadvantaged group implies therefore to enjoy either a better or worse health status (Powers & Faden, 2006). Pervasive social inequalities can have a negative health impact, which might translate later into health inequities (CSDH, 2008). Social inequalities are a result of social hierarchies privileging one over the other (Burke & Eichler, 2006). Society is therefore a system in which groups of people are divided into layers according to their relative position. These layers and their corresponding hierarchies are not naturally given, but socially constructed, that is produced as well as reproduced by the members of a society. Distribution of resources is divided along these power structures and thus regulates access to resources for those belonging to a certain social group which can then result in inequalities (ibid). In most societies, these power structures are well established. Depending on the type of society itself, the dominant social hierarchies can be gender, ability, race/ethnicity, caste, age, aboriginal status, geographical location, language, religion, sexual orientation, and others. In real life human beings usually consist of more than one social category (Johnson & Repta, 2012). However, the respective importance and dominance of a social category depends on the societal and actual context. Therefore, reaching the goal of health equity makes a multidimensional analysis necessary in order to identify relevant social groups, their corresponding social hierarchies and how they intersect (Burke & Eichler, 2006). At the moment, the exact pathways how social determinants influence health behavior and ultimately health status is only partly revealed, but the findings imply that the influence of social determinants are modifiable through social interventions (CSDH, 2008).

As a summary, health-related behaviors can be viewed as a result of the social environment (Tarlov, 1996). In regards to the topic of this dissertation, research suggests that child health equity can be enhanced by scaling up breastfeeding rates (Roberts et al., 2013). One possibility therefore might lie in addressing underlying factors like pertinent social determinants that influence the breastfeeding mother and her child.

## 2.12 Interventions to Promote Breastfeeding

The meta-analysis conducted by Rollins et al. (2016) revealed that the identified determinants can be influenced by interventions in regards to the settings as elaborated in their conceptual model (figure 5). Regarding health systems, four measurements of the BFHI were investigated and found to be effective: personal or group-based breastfeeding advice, encouragement of early onset of breastfeeding and lactation counselling enabling almost every second woman to breastfeed exclusively and two thirds to breastfeed (Rollins et al., 2016). The risk of delayed onset after having delivered by cesarean section is outweighed by adequate support (RR 0.95 [CI 95% 0.84-1.07]), also in regards to a reduced period of exclusive breastfeeding (RR 1.08 [CI 0.82-1.41]).

Regarding family and the community, the provision of breastfeeding counselling in ANC and PNC delivered by health workers (nurse, lactation consultant or other health provider) in combination with care provided at home impacted positively on early initiation (RR 1.74 [CI 95% 0.97-3.12], exclusive (RR 1.48 [95% CI 1.32-1.66]), prolonged (RR 1.26 [95% CI 1.05 – 1.50]), any breastfeeding (RR 1.16 [95% CI 1.07-1.25]). The effect was most pronounced if support was delivered in more than one period. Interventions delivered at the community level (group-wise delivered breastfeeding advice, social mobilization with and without involvement of mass media) was highly effective for early initiation leading to a rise in 86% (95% CI 33-159), and for 20% in exclusive breastfeeding (95% CI 3-39). As for the policy level, almost all countries implemented a protection policy for maternity, with half adhering to the standard of 14-week minimum maternity leave, and less than one fifth implemented the recommendation issued of 18 weeks as recommended by the International Labour Organization (Rollins et al., 2016). This situation is exacerbated by informal labor sectors with no regulation at all, of which 80% are located in Africa and Asia. Though there are a limited amount of studies investigating the effect of maternity leave, results demonstrate that they are effective for exclusive breastfeeding (RR 1.52 [1.03-2.23]), and breastfeeding is prolonged if there is provision of a possibility to breastfeed or express breast milk at the workplace. Mothers are legally entitled to paid breastfeeding breaks in 130 out of 182 countries researched, opposed by only seven for unpaid breaks, and 45 countries had no breastfeeding policy (Rollins et al., 2016). A legal basis of paid breaks led to an increase of almost 9% in exclusive breastfeeding. Rollins et al. (2016) state that the impact of direct interventions has been mostly evaluated so far, but to a lesser extent policies directed at structural obstacles.

As described here, breastfeeding can be positively influenced by interventions provided at health services, in families and in the community. The influence is substantially increased when interventions are combined, e.g. health services and community (ibid). Regarding legal frameworks like maternity leave and workplace regulation, studies are mainly limited to high-income countries.

### **2.13 Guidelines as an Intervention to Promote Breastfeeding**

Policies, especially public health policies, delivered as laws, regulations and guidelines have the potential to strongly influence the health status of a population (Brownson et al., 2009).. One of the interventions belonging to the policy level, but not further specified in the above mentioned meta-analysis from Rollins et al. (2016) is a guideline. It is an instrument developed for health service delivery that influence practice and thus can contribute the reduction or exacerbation of health inequities (Dans et al., 2007; Acosta et al., 2011; Shi et al, 2014). In general, guidelines are recommendations elaborated for the health services sector and embrace different types, such as clinical practice and public health guidelines, as well as health policy recommendations (Schünemann et al., 2006). They can be implemented at the national level, but more often at the institutional level (Pfaff & Schrappe, 2011). Guidelines are considered to be useful and necessary instruments to assure a high-quality clinical practice and adherence to guidelines have a positive impact on health outcomes in patients (Grimshaw et al., 2004). The most common form of guidelines applied at the institutional level is clinical practice guidelines (CPGs). The Institute of Medicine (IOM) defines clinical practice guidelines as follows:

“Clinical practice guidelines are statements that include recommendations intended to optimize patient care that are informed by a systematic review of evidence and an assessment of the benefits and harms of alternative care options.” (IOM 2011:4)

They serve as a support for stakeholders in order to facilitate informed decision-making, as well as to ensure that evidence-based standardized procedures are being followed for the achievement of optimal health outcome (IOM, 2011). The main purpose of a clinical practice guideline is to have a positive impact on a patient by providing advice on individual care in the clinical setting and subsequently to improve population health (Politi et al., 2013). Thus, clinical practice guidelines are primarily designed for a clinical setting, however, the health care continuum reaches beyond (AGREE, 2009). In order to do so, public health guidance or guidelines are developed. They target individuals as well as populations for health promotion and disease prevention (NICE, 2015b). They can be directed at a special health issue like smoking, at certain populations as children, and a specific setting as the work site. Therefore, they require a coordinated inter-sectoral approach in order to provide comprehensive prevention, treatment, care and support (WHO, 2016a). The compilation of a comprehensive guideline depends on a variety of factors, such as a thorough evidence base as well as social, economic and political factors.

In 2005, the WHO launched an initiative to redefine its position in regards to health research and drew on its responsibility for recommendations derived from high-quality research (Oxman et al., 2006). The ultimate aim of WHO was to produce a handbook for guidelines. One

element that had been neglected so far was equity to be integrated into the different steps of guideline development (Schünemann et al., 2006). In Guidelines 2.0 published in 2014, Schünemann et al. reaffirm that

“Current guidelines for guideline development manuals place a heavy focus on systematic reviews of the evidence and clinical outcomes, whereas less attention is paid to providing guidance on considering [...] equity” (Schünemann et al., 2014: E129).

As of today, the main obstacles derive from constraints of methodological and conceptual approaches (Shi et al., 2014). The strongest evidence for guidelines is based on randomized controlled trials, but its results are not necessarily applicable to certain subgroups (Aldrich et al., 2003). In general, controlled studies raise a problem with efficacy that is defined as the anticipated effect of an intervention when applied in practice (Tugwell et al., 2006; Pfaff & Schrappe., 2011). Patients included in controlled studies are not representative of the population and hence results cannot be generalized. This can be especially true for the requirements of disadvantaged populations, such as people with a low socioeconomic position. Guidelines therefore embrace the potential to contribute to health inequity (Aldrich et al., 2003; Dans et al., 2007; Shi et al., 2014). Another aspect is that conditions under research form the basis for guidelines and therefore provide estimates about how interventions work under ideal circumstances, but not necessarily in a real life setting (Bonita et al., 2006; Tugwell et al., 2006; Pfaff & Schrappe, 2011; Bitzer et al., 2012). Hence, these conditions tend to be less complex, and do not account for the influence of contextual factors.

“The impact of context on implementation is important, and the systematic study of the attributes of context (and their role and modifiability) that form barriers or facilitators to implementation is needed.” (Eccles et al., 2009: 3)

In order to address breastfeeding in its complexity, three major components have to be taken into account: the three different periods taking place in a variety of contexts where differing social determinants influence the mother and her child. This could be accomplished by formulating a comprehensive public health or health practice guideline with the aim to increase breastfeeding rates and enhance health equity in children.

### 2.13.1 Tools that Address the Inclusion of Social Factors

So far there have been several instruments and tools in place in order to address health equity issues in guidelines that will be presented here finalized by the one that is applied in this research.

The National Health and Medical Research Council published a handbook titled “Using socio-economic evidence in clinical practice guidelines” (Commonwealth, 2002). Authors elaborated a framework focusing on socioeconomic evidence and how to integrate it into clinical practice guidelines. Another project was initiated by the International Clinical Epidemiology Network, the KNOWLEDGE PLUS PROJECT (Dans et al., 2006: 540). They aim at developing what they term “health practice guidelines” for the poor based on evidence to enhance effectiveness PLUS “equity and local appropriateness” (The INCLEN Trust, 2016). Evans and Brown (2003) elaborated the PROGRESS framework that takes inequity gradients in social groups based on place of residence, race, occupation, gender, religion, education, socioeconomic status, social network and social capital into consideration, and was later completed by Oliver et al. (2007) by addition of the determinants: age, disability and sexual orientation. The National Institute for Clinical Excellence (NICE) produced a guide on how to integrate equality issues in guideline development, as well as prevent discrimination that is against the law and provide opportunity of equality (NICE, 2012b). They emphasize the consideration of three groups which they term the “equality groups”, the first one pertaining to a group which is labelled as “protected characteristic”: age, disability, gender reassignment, pregnancy and maternity, race including ethnic or national origins, color or nationality, religion or belief as well as lack of belief, sex and sexual orientation (NICE, 2012b:7). The next group refers to the one that is a main factor for disadvantages in health outcome: socioeconomic status, and the last group are people who suffer from poor health because they possess a “protected characteristic” or low socioeconomic status, but are additionally deprived, such as refugees and asylum seekers, migrant workers, looked-after children and homeless people (NICE, 2012b:10).

The above mentioned tools share in common that they specify respective social determinants, and except the PROGRESS-Plus tool give recommendations in which parts of the guideline they should be integrated. However, no tool addresses specifically the formulation of guidelines.

### 2.13.2 The BIAS FREE Framework

The tool **B**uilding an **I**ntegrative **A**nalytical **S**ystem **F**or **R**ecognizing and **E**liminating in**E**quities, BIAS FREE framework in short, developed by Burke and Eichler (2006) was developed for the Global Forum of Health. This independent and international organization has a special focus on the health of the disadvantaged, with one aim to gain insights into the social, eco-

nomic and environmental determinants of health (Global Forum for Health Research, 2012). If guidelines are to be formulated in a way that they enhance health equity, social determinants relevant to the topic of the guideline should be addressed based on the evidence available and moreover by employing a language that does not perpetuate dominance (Burke & Eichler, 2006). The types of social categories to look for are gender, disability, race/ethnicity, age, class, caste, socio-economic status, religion, sexual orientation, geographical location and health status. The framework is applicable to research, legislation, policies, programs and practices (Burke & Eichler, 2006). The application for this dissertation is outlined in the methods part further described in detail.

This instrument is based on the Gender-based Analysis tool developed by Eichler (Eichler, 1991) and was developed to identify gender bias, e.g. in research. The tool is based on the premise that

"[...] gender bias is a systematic and pervasive problem that distorts our knowledge. Critiquing it is premised on the notion that socially dominant knowledge tends to be the knowledge of the ruling group." (Eichler in Baldaszti et al., 2001).

It is centered around three problem types - Androcentricity, Gender Insensitivity and Double Standards - and applies diagnostic questions. The concept behind Androcentricity is that women are assessed against men with men representing the prototype. Gender Insensitivity stands for the fact that although implications are not gender neutral and no difference is made although necessary. Double Standard stands for making a difference when it is obsolete (ibid). This tool was then further elaborated by incorporating an intersectional approach and examining also for race and disability.

The basic idea is that health is fundamentally tied to human rights. Besides, social inequality and social inequities are considered to be rooted in the domination of social groups over others (Burke & Eichler, 2006). The BIAS FREE framework is a practical tool for identifying and eliminating the perpetuation of social hierarchies in health research (Burke & Eichler, 2006). "The term hierarchy (literally: holy order) indicates a social system in which people are stratified on a continuum of economic, political and social power. Where one is located on a hierarchy is profoundly consequential. In every society, access to social goods, decision-making and economic and social well-being is shared unequally among all members, depending on where they fit in a given social hierarchy. Power structures within a society serve to reinforce and maintain the various social hierarchies" (Burke & Eichler 2006:1).

It lends to a perspective from the political economy of health.

"Power structures, ideology, hegemony and oppression are central to the political economy of health perspective" (Dykes, 2006: 58).

This approach is based on the idea that members of society belong to certain social categories, such as gender, race/ethnicity, class, dis/ability, religion/beliefs, sexual orientation and age (Mulderig, 2007). According to the logic of dominance, there are dominant versus non-dominant groups. e.g. men versus women, white ethnic against black ethnic, able against disabled. This asymmetry is the root basis for inequalities. The mechanism through which dominance exercises an influence on health is through discrimination by being identified as a member of a non-dominant group, as well as to a disadvantage in regards to resources or opportunities (ibid).

Besides that, the identity of a certain social group is formed through common beliefs, values and attitudes (Neuman, 2011). These values then inform the generation of knowledge of that social group, termed as social construction of knowledge. As a consequence, knowledge constituting the basis for different activities, such as research, policy formulation or guideline development cannot be considered to be value-free (Neuman, 2011). Equally, medical practices are shaped by the political, economic and social framework of a society and those dominant groups that reinforce their interests (Dykes, 2006). Therefore, it is necessary “[...] to challenge an ideology, public knowledge or authority that sets guidelines, policies or instructions.” (Street, 1992 in Dykes, 2006: 54). These systematic flaws informing knowledge production contributing to health inequities were classified as ‘social biases’ by Burke & Eichler (2006).

The BIAS FREE framework sets out to analyze the language of power and social inequality working in a way that it identifies “privileging” social hierarchies (ibid). In the case of guideline formulation, this is an important assumption which needs to be taken into account during the process of guideline formulation. At the core of breastfeeding are a mother and her child. In order to enhance a woman-centered approach, it is therefore necessary to unveil the dominant assumptions that manifest themselves as the social determinants and result in health inequities in regards to women, their children and how this affects breastfeeding (Dykes, 2006).

So far, the tool has been applied for a variety of projects, as the transformation of a hospital in Costa Rica, the investigation of disabled children in Kyrgyzstan, the development of a draft for a National Disability Policy & Action Plan in Pakistan, the development of gender bias-free Clinical Practice Guidelines for the Ministry of Health, Basque Country in Spain, as well as a priority assessment in regards to the current state of national health research in Venezuela, and finally it was used for analyzing HIV/AIDS programs in Uganda (BIAS FREE Inc., 2015). In academics, it served for developing bias-free courses on Disability Studies, Law, Engineering, Sociology, Equity Studies, Women’s Studies, Medicine, Graduate Studies and Research Methods at universities in Australia, Canada, England, Germany, Ireland and Senegal.

## **2.14 Country Examples**

For this dissertation, three countries were chosen for investigation to contrast results, Germany, the United Kingdom and Ghana. They are different in regards to breastfeeding patterns, as well as maternity related policies and cultural backgrounds yielding valuable insights. At the same time, they share in common that their health systems provide free access to maternity care and all three of them have implemented recommendations regarding breastfeeding.

### **2.14.1 Country Example 1: Germany**

Germany, the first country under research, is located in Europe between the 47°16'15" and 55°03'33" north latitude, and between 5°52'01" and 15°02'37" east longitudes (Diercke Internationaler Atlas, 2011). Its political system is federal consisting of 16 republics called Laender and a population of approximately 81 million people (Statistisches Bundesamt, 2016). It is a constitutional democracy with a parliamentary social welfare system and has a social market economy (bpb, 2016). Health insurance is mandatory, and the health system is financed by statutory health insurance and private health insurance (BMG, 2016). Antenatal, obstetric and postnatal care is covered by the statutory health insurance scheme (BMJV, 2015), but not necessarily covered for self-employed women who are members of private health insurances.

Regarding antenatal care, statutory health insurance covers a training on birthing offered by midwives where they receive information on breastfeeding (Rouw et al., 2014). However, there are no standardized quality criteria regarding the content of these courses. Around one fifth of all newborns are delivered in a baby-friendly hospital, and every year one more hospital is certified (Rebhan et al., 2008). In 2014, approximately 1.5% of all births take place outside a hospital, either at home or in a birth center run by midwives (QUAG, 2014).

The National Commission on Breastfeeding located at the Federal Institute of Risk Assessment is in charge of issuing breastfeeding recommendations (BfR, 2016). According to the BfR, infants can be exclusively breastfed for four to six months. However, the Association of the Scientific Medical Societies in Germany, in charge for the elaboration of guidelines, confirmed in 2014 their recommendations to limit the exclusive breastfeeding period to four full months in order to prevent allergies (AWMF, 2014).

A general problem in maternal health services is shortage in staff in general, and more in regards to breastfeeding-skilled personnel (Rouw et al., 2014). After the release from the hospital, mothers are entitled to receive midwifery care at home for the first 12 weeks, a recent increase by four weeks (Präventionsgesetz, 2015). In Germany, midwives are not specifically trained in breastfeeding support, neither pediatricians and obstetricians who render the outpatient care postpartum (Rouw et al., 2014). Advice from a trained breastfeeding pro-

essional is not covered by the statutory health insurance. Regarding the NGO sector, there are independent breastfeeding support groups offered (AFS e.V., 2016). Regarding parental leave, parents are entitled for a 12-month paid leave regardless whether they had been employed or self-employed, followed by 24 months' unpaid leave (BMFSFJ, 2015). As for workplace regulation, women have a right for twice a 30 minutes paid break to breastfeed during the regular 8-hour work day (BMJV, 2012). Regarding provision of a separated room to breastfeed and/or to express breast milk, as well as for storage there is no legal regulation (Rouw et al., 2014).

Fortunately, mortality due to infections has been reduced to 3.3 per 1000 infants, and 4 per 1000 children under five years (BiB, 2015; The World Bank, 2016). Regarding the disease pattern, around 16% of all children suffer from some sort of chronic diseases, with 15,3% allergies the most prevalent, followed by overweight/obesity and diabetes mellitus type II (Neuhauser et al., 2014; Schmitz et al., 2014; BMBF, 2016). Around one fifth of all children have a mental health diagnosis, mainly Attention Deficit Hyperactivity Syndrome (Hölling et al., 2014).

For Germany, until date there is no routine monitoring of breastfeeding at the national level (von der Lippe et al., 2014). The Public Health Institute of Germany, the Robert Koch Institute (RKI), conducts a representative cohort study in child and adolescent health called KiGGS starting in 2003 (Lange et al., 2007). In the cohort of those born 2002 – 2012, there are no data available for early initiation, but approximately 34% were exclusively breastfed for four months, another 47,7% were fully breastfed for four months, and 17,7% for six months respectively (von der Lippe et al., 2014). In general, 82,1% of all infants were ever breastfed, and the average duration was 7,5 months. Compared to the first KiGGS cohort of children, breastfeeding prevalence is higher, but there is no difference in duration (RKI, 2015).

Regarding determinants, there was no difference in the breastfeeding periods according to gender of the child (von der Lippe et al., 2014; RKI, 2015). Younger mothers breastfed less often than older mothers, and maternal educational level was the main determining factor regarding breastfeeding duration. Infants of mothers with a high educational level were five times more likely to be breastfed compared to those with a lower educational. Children born in the Eastern part of Germany were more often breastfed with 88,4% opposed to 80,7% of West German descent. Mothers who smoked during pregnancy were three times less likely to breastfeed their offspring (von der Lippe et al., 2014; RKI, 2015).

### **2.14.2 Country Example 2: The United Kingdom**

The second country that was investigated, the United Kingdom is located in Europe between the 49° north latitude, and between 9° west to east longitudes (Diercke Internationaler Atlas, 2011). It consists of four countries, England, Wales, Scotland and Northern Ireland united to

the United Kingdom of Great Britain and Northern Ireland and has a population of 64.6 million people (NHS, 2016). It is a parliamentary constitutional monarchy with a welfare system and a regulated market economy (Gov. UK, 2012). The National Health System is tax financed, and service is free of charge at the point of use except for optical and dental services and prescriptions (NHS, 2016).

Antenatal, postnatal and obstetric care is therefore covered. In antenatal care classes, there is information provided in different formats in regards to breastfeeding, like leaflets, health facility talks and DVDs, leading rather to an information overload (Hoddinott, 2014). Postnatal care is delivered by a midwife or public health nurse for the first eight weeks postpartum (NICE, 2006), and there is special support for women from low income households (NICE, 2008). In 2012, only a small percentage of births take place outside the hospital setting (BirthChoiceUK, 2011). Wales demonstrated the highest number with approximately 3,15%, followed by England with 2,36%, Scotland with 1.38% and finally Northern Ireland with 0.26% (ibid). Maternity health services are chronically understaffed, and midwives work in a rotating system (Dykes, 2006). When on duty, they eventually have to switch to the obstetric ward in case there is need (ibid). Maternity staff is not specifically trained for professional breastfeeding support (UNICEF UK, 2012).

Breastfeeding recommendations follow WHO, and the official recommendations by the National Health System (NHS) in 2016 were to exclusively breastfeed for 26 weeks, and then to continue for up to two years (NHS, 2016).

Regarding maternity pay and leave, the minimum requirement is for two weeks after delivery, and four weeks for factory workers (GOV.UK, 2016). Public employees are entitled to ordinary maternity leave of 26 weeks plus additional maternity leave of 26 weeks, depending on their prior financial contribution to the public system. There is a possibility for fathers to engage in paternal leave for children born after April 5, 2015 and depending on the similar requirements as for maternity leave (ibid). In regards to workplace regulation, in public workplaces women should not be discriminated for breastfeeding, but there are no policies regarding the provision of adequate space and storage possibilities and mothers are not entitled to paid breastfeeding breaks (GOV.UK, 2016). Aside of that, breastfeeding women face several other challenges. Since the last two generations had not been breastfeeding anymore, social acceptance especially breastfeeding in public has decreased (UNICEF UK, 2012; Hoddinott, 2014). Moreover, the media advertising culture led to the sexualization of breasts, which as a consequence have become unsuitable for nurturing a child (Dykes, 2006; Hoddinott, 2014).

UNICEF UK is strongly advocating for the Baby Friendly Initiative (UNICEF UK, 2010) and provides a guide for the UNICEF UK Baby Friendly Initiative standards. Currently, 57% of all

maternity services, 60% of health visiting services, 36% of midwifery courses and 13% health visiting courses offered at universities are fully accredited according to the UK Baby Friendly Initiative (UNICEF UK, 2016). In England, about half of all births occur in an accredited baby friendly hospital, in Scotland 95%, in Northern Ireland 92% and finally Wales 61% (ibid).

Infant mortality rate was 3.7 deaths per 1000 live births in Scotland (NHS Scotland, 2014), 3.8 deaths per 1,000 live births in England and Wales (ONS, 2015), but 4.8 per 1000 live births in Northern Ireland (NISRA, 2015) and under-five mortality is 5 per 1000 live births (The World Bank, 2016). About half of all children in the UK suffer from some sort of atopic disease (Allergy UK, 2013). The Health and Social Care Information Centre (HSCIC) reports in 2011, that there is a slight rise in communicable disease for respiratory and diarrheal infections and subsequent hospital admission (HSCIC, 2011). Obesity and diabetes mellitus type II play a major role with a prevalence of 15% in the age group of 2-15 (ibid). In the United Kingdom, less than 3% of births take place outside a hospital (HSCIC, 2016).

According to the infant feeding survey from 2010, as for early initiation in 2010, 74% of all newborns were put to breast within one hour after birth, and 34% were still breastfed at the age of six months (McAndrew et al., 2012). There is a steep decrease from 81% to 69% in the breastfeeding prevalence after the first week, and it was almost halved after six weeks (ibid). As a result, exclusive breastfeeding at six months was one in 100 mothers (0.01%). In general, 81% of all infants in the United Kingdom were ever breastfed, and in 2005, 76% of all infants had been breastfed compared to 81% in 2010. Breastfeeding rates generally increased in England, Wales and Scotland, but not in Northern Ireland.

Mothers displaying highest breastfeeding initiation rates were older mothers ( $\leq 30$  years). However, the main determining factor was ethnicity (Chinese, Black and other Asian ethnicities), and those having a higher educational and/or professional level, as well as those living in less deprived areas (McAndrew et al., 2012).

### **2.14.3 Country Example 3: Ghana**

The third country example, Ghana, is located in Western Africa on the latitude and longitude of 8°00'N and 2°00'W respectively (Diercke Internationaler Atlas, 2011). It is a constitutional democracy, with ten administrative regions and a population of about 27 million people (GSS, 2015). Ghana has a capitalist, market-based economy (CIA, 2016). It is considered as an open economy, since it implemented hardly barriers for foreign trade and investment. Agriculture plays a major role offering employment to approximately half of the workforce, basically as in the form of small land ownership (ibid).

The government of Ghana implemented a National Health Insurance System in 2003. Since 2004, the National Health Insurance Policy covers maternal care for the antenatal, the birth and the postnatal period (NHIS, 2016). According to the Demographic and Health Survey

Ghana, it showed a positive effect on coverage for antenatal care services (GSS, 2015). During antenatal care services, an essential service package is delivered consisting of prevention and treatment of malaria and anemia, micronutrient supplementation and tetanus immunization, as well as education on vital signs that indicate complications. Almost three quarters of births take place in a health facility with 65% in a public healthcare institution, and 27% occur at home. However, there is a strong rural-urban divide and only every second women with a low educational level and wealth quintile delivers in a health facility (ibid). Women who delivered in a governmental health facility were 3.5 times more likely to breastfeed exclusively compared to those who delivered at home (Tampah-Naah & Kumi-Kyereme, 2013).

Regarding antenatal care, women receive breastfeeding-related information including how to express breast milk (Sagoe-Moses, 2014). From 2011-2013, 66% of women had received HIV counselling, from which around half were provided with an HIV test and obtained results (GSS, 2015). All women that delivered are entitled to a child health workbook free of charge providing information on infant feeding focusing on exclusive breastfeeding (Sagoe-Moses, 2014). Mothers can attend mother and child health clinics after delivery for check-ups and breastfeeding counselling (ibid).

The Ghana Health Service (2015) recommends early initiation within one hour after birth, exclusive breastfeeding for six months and a breastfeeding period of two years and beyond. Employed mothers are entitled to 12 weeks paid maternal leave additional to the annual leave of one month (LABOUR ACT, 2003). Mothers also have the right for a one-hour break per work day at the workplace that can be divided into two times for 30 minutes (Sagoe-Moses, 2014). However, provision of facilities, quiet spaces, privacy and storage capacities place a major obstacle to breastfeed and/or express breast milk.

In 1995, the Baby Friendly Hospital Initiative was launched in Ghana to promote breastfeeding with 325 accredited maternity facilities in 2011, mostly public (Aryteetey & Antwi, 2013). Besides, the initiative Scaling-Up Nutrition (SUN) formerly mentioned in chapter 2.2 is a governmental activity to promote exclusive breastfeeding under the roof of the UN network for nutrition (Sun movement, 2015).

Half of the population in Ghana lives in rural areas (GSS, GHS, and ICF International, 2014). Estimates for infant mortality are 46 deaths per 1000 children in urban and 56 in rural areas, and under-five child mortality 94 in rural compared to 72 in urban areas per 1000 live births. As for infant mortality, about 60% die during the neonatal period (first 28 days of life) (ibid). Scaling up rates for early onset of breastfeeding could therefore contribute substantially to lower the newborn death rate (MoH Ghana, 2009). Exclusive breastfeeding per se is of high importance, since according to estimates newborn deaths (between birth and 28 days of life)

represent 40% of the under-5 mortality rate. Main causes are due to infectious diseases with the highest share in malaria, followed by pneumonia, diarrhea and malnutrition (ibid). Besides, Ghana belongs to the region which has also been affected by HIV/AIDS, which has reached the state of a low level, generalized but stable epidemic (UNICEF, 2012). In 2009, 2.9% of all pregnant women were HIV positive, however, only half of them were tested at all (ibid).

National data for breastfeeding are derived from the Ghana Multiple Indicator Cluster Survey according to which early initiation was 45.9% of all newborns, and 45.7% of all infants were still exclusively breastfed at five months' age (GSS, GHS, ICF International, 2014). At six months, 98.8% of children were breastfed, at 12 months 95.2% and at 23 months 37.4% respectively. The mean duration of breastfeeding is 20.3 months (ibid).

As for factors determining breastfeeding, young maternal age, primary and secondary and higher educational level, marital status, maternal works status, and Christian versus Muslim religion are factors associated with the introduction of any sort of solids among infants who were three to five months old (Issaka et al., 2014). The study from Aryeetey et al. (2013) revealed a contradictory finding that educational level of secondary and above is protective for exclusive breastfeeding. Christians living in the Northern and middle part of Ghana adhere more often to current breastfeeding guidelines, whereas traditional believers tend to practice traditional rites unfavorable for early initiation (Aborigo et al., 2012). Social networks, represented by the mothers-in-law are highly influential because of their powerful position in society and due to the fact that married women live in their husband's compound sharing the same home with her (Tawiah-Agyemang et al.; 2008; Aborigo et al., 2012). The head of compound and community leaders who are usually male also play a major role beneficial for breastfeeding, followed by the father of the child (ibid).

## **2.15 Summary**

Summarizing this chapter, breastfeeding incurs substantial health benefits for mother and child, but WHO recommendation of early onset within one hour, exclusive breastfeeding for six months and an entire breastfeeding period of two years are currently not met (Victora et al., 2016). However, the promotion of breastfeeding with the aim to scale up breastfeeding rates can make a substantial contribution to enhance health equity in infants. The way breastfeeding is presented and recommended appears as if onset and the following two periods have to be viewed separate from each other. However in reality, when breastfeeding is practiced as recommended by WHO (2013c), then the care continuum (WHO, 2005) as delineated in chapter 2.9 expands from onset to a period of 24 months. Thus, breastfeeding can be viewed as taking place in a continuum, which was the concept applied for this thesis. At the same time, being a continuum, it takes place in different settings like the start at the

hospital, the continuation at home and then later in public and finally at work. In each single setting, different social determinants exercise an influence on the mother and her child, thus determining her breastfeeding behavior as outlined in this chapter (2.11 and 2). Since breastfeeding has a primarily protective effect on the health of the mother and her child (2.3, 2.4, 2.5) the health equity in them can be enhanced or deteriorated.

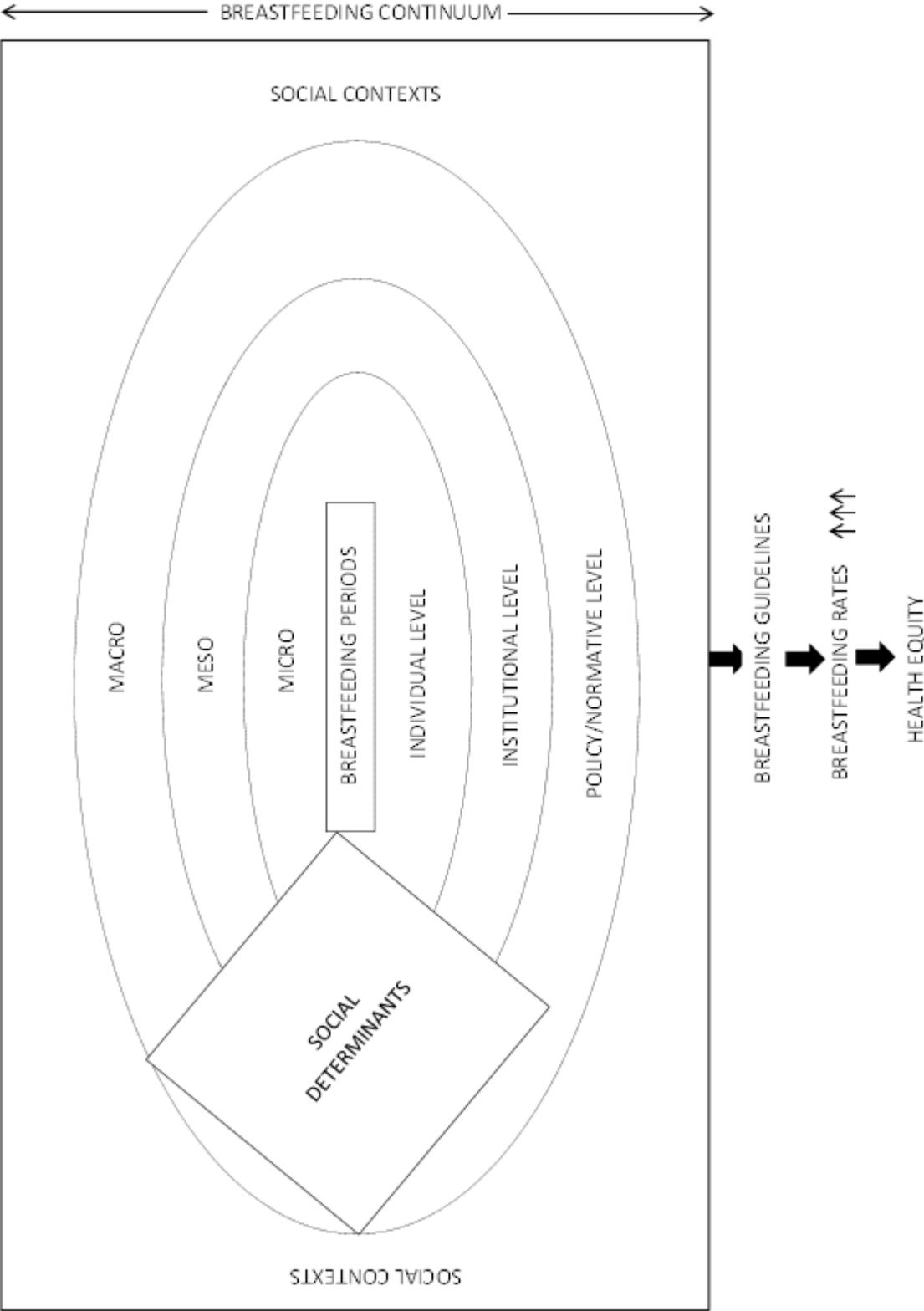
One instrument to enhance health equity is through policies and guidelines. Applied to the topic of this research, these three elements have to be taken into account in order to formulate a comprehensive policy or guideline.

Besides that, breastfeeding patterns vary in-between countries. It is therefore essential to first unveil

- which social determinants influence breastfeeding
- at what societal level (individual, institutional, structural/policy)
- in what kind of social contexts (i.e. hospital, home, workplace, public)
- at what stage of the breastfeeding continuum represented by the breastfeeding period and then to verify whether these are addressed in guidelines pertinent to breastfeeding. For the purpose of contrasting results, the three countries Germany, the United Kingdom and Ghana have been selected.

The following figure is a visual summary of the theoretical model that was researched for this dissertation.

**Figure 6: Theoretical Model of the Research**



Therefore, the aim, objectives and research questions for the dissertation are as follows:

### **3 Aim, Objectives and Research Questions**

The overall aim of this research was to verify how breastfeeding-related guidelines can be formulated in order to decrease the effectiveness gap by taking contextual factors into account.

In order to achieve this aim, the following three objectives were elaborated:

Objective no. 1: The first objective was to identify prevailing social determinants that exercise an effect on breastfeeding in respective social context(s) on the basis of the current state of research in Germany, the United Kingdom and Ghana.

Objective no. 2: The second objective was to determine whether breastfeeding-related guidelines of Germany, the United Kingdom and Ghana sufficed the two concepts of quality in guideline elaboration as required by WHO

Objective no. 3: The third objective aimed at clarifying whether the breastfeeding stages recommended by WHO, early onset, six months-period of exclusive breastfeeding and continuation of a complementary breastfeeding period of 24 months, reflected a continuum.

The above outlined research problems therefore led to the following research questions:

Does the current state of research of the three countries Germany, the United Kingdom and Ghana reveal an insight on the effect of social determinants in the respective social context(s) and their outcome on the different periods of breastfeeding?

Do breastfeeding-related guidelines of Germany, the United Kingdom and Ghana adhere to the required standards of quality, evidence, clinical outcomes, as well as equity, by addressing relevant social determinants and their pertinent social contexts?

Do breastfeeding-related guidelines of Germany, the United Kingdom and Ghana address the relevant breastfeeding stages, early onset, exclusive breastfeeding for six months and a length of 24 months comprehensively?

How do breastfeeding-related guidelines need to be formulated in order to enhance health equity in children?

## **4 Methodological Approaches Applied for this Dissertation**

For this dissertation, two methodological approaches were applied. The first one relates to the identification of pertinent social determinants of breastfeeding in Germany, the United Kingdom and Ghana by a Realist Review, and the second one to the analysis of breastfeeding-related guidelines of these countries with the BIAS FREE Framework.

### **4.1 Realist Review**

The first step was to identify relevant social determinants influencing breastfeeding in its continuum and varying social contexts. This was done by conducting a Realist Review for the three countries under research, Germany, the United Kingdom and Ghana.

The rationale of the methodological approach is as follows:

In Realist Reviews, theories aiming at explaining the underlying mechanisms are tested (Pawson et al., 2005). Regarding the theoretical embedding, middle range theories are most suitable. In theory generation, there is a three-fold distinction according to level of abstraction: universal theories, middle range theories and empirical research. Typically, the first ones are completely abstract, aiming at explaining the basics that are associated with social behavior, social organization and social change (Merton, 1968). The last ones pertain to ad hoc research to verify the demand of something (empirical research). In Realist Reviews, middle range theories are tested (Pawson et al., 2005). They are located in-between universal theories and empirical research.

“Middle range theory is principally used to guide empirical inquiry. It is intermediate to general theories of social systems which are too remote from particular classes of social behavior, organization and change to account for what is observed and to those detailed orderly descriptions of particulars that are not generalized at all.” (Merton, 1968: 39)

Thus middle range theories consist of a certain abstraction, and at the same time take into account observations which can be empirically tested. They focus on social phenomena, as for instance “a theory of reference groups, of social mobility, or role conflict and of the formation of social norms [...]” (Merton, 1968: 39). A well-known example for middle range theory is Max Weber’s theory that capitalist societies common in Europe and North America evolved due to the increasing influence of Lutheran Christian religion, Protestantism (ibid). Another example is theories about relative deprivation and their societal consequences, such as social marginalization leading to inequities.

Macro theories explaining the underlying mechanisms of (health) inequalities are also considered suitable for being tested in a Realist Review (Pawson et al., 2004). The universal theory behind is Social Justice Theory which is too broad and general to be applied to a concrete research project.

“Equity means social justice or fairness, it’s an ethical concept grounded in principles of distributive justice. (Braveman & Gruskin 2003: 254)

## **4.2 Causation in Realist Reviews**

As already outlined in the background chapter, increased breastfeeding rates enhance child health equity (Roberts et al., 2013). This can be achieved by addressing underlying factors like the social determinants that affect mother and child and thus their breastfeeding behavior in the different social contexts of the breastfeeding continuum.

Realist Reviews have been developed to answer the question: what works for whom under what circumstances and why? (Pawson et al., 2005).

Interventions as well as individuals with their reasoning and reactions do not stand isolated by their own, but are part of complex social systems. According to Pawson (2006) it is the dynamics of social ties in social systems that lead to modifications in people’s behaviors, in what occurs thereafter and in social circumstances. As a result, the ‘same’ intervention is situated in a varying context and setting. As a consequence, the effect of the ‘same’ intervention varies accordingly, making it difficult to produce results that can be generalized (ibid). An intervention can be regarded as a result of its contexts. Pawson considers a Realist Review an excellent opportunity to unwrap the contextual variations present and/or active (Pawson 2006: 31). It is necessary to emphasize which mechanisms make an intervention work in a given context, thus directing research at investigating mechanisms of action. Mechanisms can therefore be considered as agents of change (Wong et al., 2013). The “nature” of mechanisms is such that they are usually concealed, modify according to diverse contexts, and most importantly engender outcomes. Besides, mechanisms exist and exercise an influence at all levels of reality possibly relating to each other or not (ibid).

The aim for the Realist Reviews at stake is therefore to unravel the relationship between context C, mechanism M and outcomes O – the C-M-O relationship (ibid). In realist inquiries, underlying mechanisms in a specific context have an effect on the outcome. Pawson et al. (2005) provided a working definition for ‘mechanism’: Mechanisms are

“Underlying entities, processes or structures which operate in particular contexts to generate outcomes of interest.” (Pawson et al., 2005: 22).

A mechanism is what actually lies beyond the measurable effect (outcome), or what triggers that very effect and is subject to variation according to the context. Varying contexts combine

with varying mechanisms to generate more or less probable outcomes. This definition raises two issues: the first one is that mechanisms are not immediately visible and thus evasive, and secondly mechanisms are not a fixed concept, but modifiable, and thus more difficult to grasp. This is the challenge and why the method of Realist Reviews is still under way (Greenalgh et al., 2011).

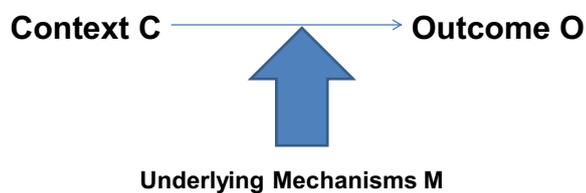
The Context-Mechanism-Outcome model is therefore defined as follows:

Outcome O of interest was generated by relevant mechanisms M triggered in specific contexts C. Therefore, when a Realist Review is undertaken, it is indispensable to make explicit the links between the concepts of the theoretical model under research, following the paradigm:

**C** (ontext) – **M** (echanism) – **O** (utcome)

The explanatory scheme that is employed is that of ‘generative causation’.

*Figure 7: Model of Generative Causation*



*Source: Adaptation of Pawson et al., 2005*

As outlined in the background chapter (2.11), Tarlov (2006) claimed that health-related behaviors can be viewed as a result of the social environment (Tarlov, 1996). The two determinants of health relevant as social determinants are health-related behaviors and the characteristics where people live. Fundamentally, the risky health behaviour is often rooted in the respective social environment (ibid).

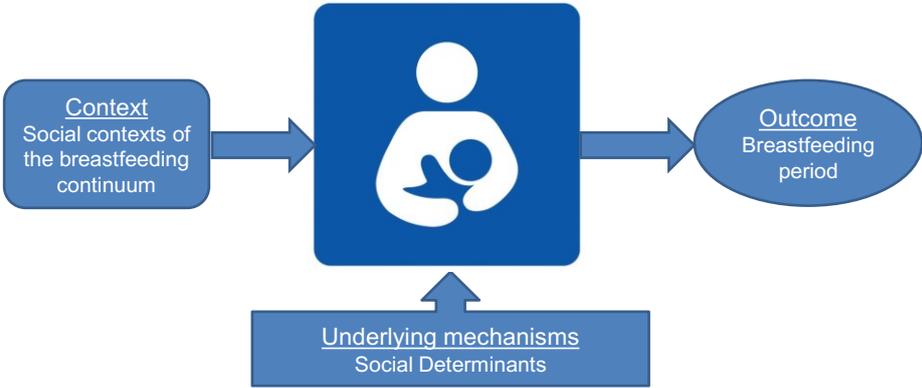
“The differential distribution of health behaviors by population social and economic characteristics often times reflects variations in the social contexts in which individuals live their daily lives. Historical and contemporary social structures shape people’s day-to-day experiences in ways that are typically not seen when examining health behaviors by broad

categorizations of race/ethnicity, sexual orientation, income, and occupation. The physical and social environments surrounding individuals are not randomly distributed. Knowledge of such structures and their interrelationships can help pinpoint intervention targets and more broadly guide the development of efficacious interventions.” (Okechukwu et al., 2014 in Berkman et al., 2014: 368).

As explained before, breastfeeding takes place in a continuum, usually starting in a health services setting except for Ghana, where around one third of deliveries take place at home, and is continued then in different social contexts, such as the family, the workplace and the public. Following the model of Pawson (figure 7) outlined above, it is then the social determinants that generate underlying mechanisms in the respective social contexts of breastfeeding.

Thus social contexts were framed as the different contexts of the breastfeeding, underlying mechanisms translated into the social determinants that are relevant for breastfeeding, and the outcome reflected in the three main stages of the breastfeeding period, that are onset, duration of exclusive breastfeeding and the entire breastfeeding period. The model of Context-Mechanism-Outcome model is demonstrated in the graph depicted below:

**Figure 8: Adapted Context-Mechanism-Outcome Model**



Source: Waldherr, 2014

The details of the Realist Reviews are described in the chapter that follows, the methods chapter.

### **4.3 Guideline Analyses**

The second step of the methodological approach to analyze breastfeeding-related guidelines from Germany, Ghana and the United Kingdom with the BIAS FREE framework. The rationale of the tool was already outlined in the backgrounds chapter and will therefore not be repeated here. The individual steps that were undertaken to conduct them are also elaborated in detail in the methods chapter.

## 5 Methods

In this chapter, the application of the methodological approaches employed in this dissertation is described. As already outlined before, two main steps were undertaken: first, a Realist Review was conducted to identify social determinants pertinent for breastfeeding in the countries under research Germany, the United Kingdom and Ghana, and in the second step guidelines of these countries pertinent to breastfeeding were analyzed.

### 5.1 Conduct of the Realist Review

At first, three Realist Reviews identifying the prevailing social determinants of breastfeeding were carried out for Germany, the United Kingdom, and Ghana. In the subsequent paragraphs the methodological conduct of a Realist Review is outlined followed by its application to this research.

Realist Reviews are a modified form of systematic reviews (Pawson et al., 2005; Royal Pharmacist Society, 2011). They are specifically developed for questions that address complex social interventions thus investigating how contextual factors influence the outcome of a given procedure (Pawson et al., 2005). Realist Reviews adhere to the standards of a systematic review, but enhance their scope to a broader range of studies that can be included (Royal Pharmaceutical Society, 2011). Nonetheless, Realist Reviews follow the standard of rigor and accountability of a systematic review through a transparent procedure in regards to searching and extracting literature. As for the decision to what studies/data will be included in the analysis, the major criterion is relevance in regards to the research question (Pawson et al., 2005).

In a Realist Review, a comprehensive search consists of four parts:

- 1) Perform a search of background materials to get an idea of the literature (scope, where to locate, amount to retrieve)
- 2) Conduct a search to identify relevant program/intervention theories
- 3) Look for factual evidence to examine some of these theories and identify evidence from a variety of primary studies applying a broad search strategy
- 4) When the synthesis of the evidence is almost complete, conduct the final search to verify further studies that support adjusting the program/intervention theories.

For the search strategy, the method of purposive sampling was employed. Thus the sampling strategy for identifying literature was not carried out at random, but focused on literature that fits the purpose of the research. The search is iterative, that means that results will be used to identify more relevant documents that can then be added. The search strategy itself and the search terms will emerge during the process of literature identification. This part remains a challenge as terms are only partially predefined and fixed, but developed during the pro-

cess (Greenalgh et al., 2011). Since it is necessary to cope with a rather diverse set of literature, the sampling technique of snowballing is recommended (Wong et al., 2013). Literature databases containing relevant grey literature like PhD dissertations and unpublished studies can be useful, as well as citation-tracking databases to single out literature indexed in other databases (ibid).

Since inclusion and exclusion criteria are not fixed in Realist Reviews and therefore do not limit the search as in systematic reviews, it is necessary to determine them according to the research question as well as during the search process itself. The original criterion for a completed search was point of saturation, a concept borrowed from grounded theory (Glaser & Strauss, 1967) postulating that a theory can be considered as complete when there is no new information to be added or insight to be gained for the theory under investigation (Pawson et al., 2004). The other criterion is comprehensiveness. This implies that all documents necessary to answer the research question have been identified (Wong et al., 2013). In agreement with the second supervisor (UL), comprehensiveness was the leading criterion for the literature search. Since the purpose was to identify relevant social determinants of breastfeeding in order to adapt the BIAS-FREE tool to Germany, Ghana and the United Kingdom. Local experts from the field were consulted for advice on which databases to access.

Next, selected studies need to be appraised according to their quality and to be synthesized to refine the original theory under test – answering the question at stake: what works for whom, how, and under what circumstances. McMahon & Ward (2012) defined appraisal according to whether the »evidence« retrieved is robust enough from a conceptual and methodological perspective to contribute knowledge to the theory under test. It is guided by the two leading criteria relevance and rigor. Relevance stands for the question in how far the studies and their results can contribute to the theory building and/or testing (Wong et al., 2013). Rigor implies a high credibility of the search strategy based on transparency. This can be achieved through keeping records of every step that was undertaken during the process. However, during theory building, it is not necessary to apply rigor as strict as during theory testing. The appraisal of retrieved literature is according to knowledge contribution (ibid).

### **5.1.1 Background Search**

In order to adhere to the methodological approach following the manual from Wong et al. (2013), a background search for social determinants relevant for breastfeeding was conducted. As recommended for the first stage, the background search was carried out not totally systematic and neither a search protocol was issued (ibid). With the respective results a C-M-O model was developed (chapter 5.1.3) that served as the matrix for the second, systematic search.

As already discussed in Chapter 2, Mikkonen & Raphael (2010) had further elaborated the list of the social determinants of health from Marmot (CSDH, 2008) and adapted it. For the purpose of this dissertation, the list had been modified according to the prevailing social determinants of breastfeeding. Following the procedure outlined in the manual for conducting a Realist Review (Wong et al., 2013), the modification was based on results from a preliminary literature analysis and underpinned with input from expert interviews. The social determinants were then conceptually adapted to the countries under research by operationalizing them as the indicators applied in the respective countries, and consent sought from the first supervisor (UMS).

Preliminary results of the background search were as follows: In the case of breastfeeding and its social determinants, there is a common overall pattern that had to be considered as a major determinant: culture, defined as convictions and opinions about breastfeeding that are common in a given society and shape the expectations of what is entailed by 'a normal breastfeeding behavior' (Aidam et al., 2005). The prevailing attitudes towards breastfeeding of the child's father, grandmothers as well as peers are known to be highly influential on breastfeeding outcomes (Kroth, 1998; Lawrence & Lawrence 2011; Lothrop, 2000). At the same time, the social support rendered by the family and peers is a crucial success factor for the establishment and continuation of breastfeeding (Kroth, 1998). Another well-known social determinant, SES reflects the social gradient in breastfeeding outcomes – the higher the socioeconomic status, the longer the exclusive as well as the entire breastfeeding period lasts (Aidam et al., 2012). One indicator of SES, maternal education, is well-researched (Senarath et al., 2012). Studies from different countries like Germany, the United Kingdom, India, Nigeria, and Ghana have shown that the higher the level of maternal education, the higher as well as longer the breastfeeding rates are (Lange et al., 2007; Hwang et al., 2006; Agho et al., 2011; Aryeetey & Goh, 2013).

### **5.1.2 Modification of List of Social Determinants of Health**

In this chapter, the adaptations and refinements that are undertaken in order to adjust the social determinants of health to the social determinants of breastfeeding will be described.

As mentioned above, the background search yielded the basis for the C-M-O model that was then tested for this research, whereby the pre-existing list of the social determinants of health from Wilkinson and Marmot (2003) and further completed by Mikkonen & Raphael (2010) was modified accordingly. This is the combined list of social determinants of health:

Aboriginal status, addiction, age, disability, employment and working conditions/work, food (in-)security, early life, education, gender, health services, housing, income and income distribution, race, social exclusion, social gradient, social safety net, social support, stress, transport and unemployment.

After discussing this conceptual approach with the first supervisor (UMS), the general concept of 'social determinants of health' was transformed into 'social determinants of breastfeeding'. The subsequent section states the rationale for reasons when to in/exclude a social determinant as well as its operationalization for Germany, the United Kingdom and Ghana.

**1) Aboriginal status:** The first determinant, aboriginal status, was not investigated because it is not of relevance for the countries under research, since no aboriginal communities are part of the populations.

**2) Addiction:** A determinant that can be relevant for breastfeeding mothers and especially their offspring, but relates to a highly vulnerable group with special needs and not further pursued.

**3) Age:** Age of mother is relevant for the duration of the breastfeeding period. Studies in Germany and the United Kingdom have revealed that the younger the mothers, the shorter are breastfeeding periods (Lange et al., 2007; UNICEF UK; 2012).

**4) Culture:** This determinant has been added after the background search for social determinants that affect breastfeeding and an interview conducted with Dr. Sagoe-Moses, National Coordinator of Child Health at Ghana Health Services. Attitudes are shaped by prevailing norms and values as towards breastfeeding. They are known to exercise a negative and/or positive influence and are a result of the cultural environment of the mother (Aidam et al., 2005). Since culture may have a direct and/or indirect effect on breastfeeding practice, it will be added as a social determinant. According to Dr. Sagoe-Moses, the family of a pregnant woman can request her to deliver at home with the support of a traditional birth attendant (TBA) involving cultural traditions that may negatively influence onset of breastfeeding (Sagoe-Moses, 2014, Tampah-Naah, 2014). Another example how culture can impede breastfeeding was pointed out by Prof. Hoddinott (2014), who emphasized that in the United Kingdom breastfeeding in public conflicting with prevalent social norms.

It is important to note here that breastfeeding attitudes of the direct social environment of the mother (father of infant, mother of mother, grandmother of mother, peers) were shifted to the

category social networks, since their attitude determine whether they will render positive or negative crucial support of the mother's breastfeeding.

**5) Disability:** It can be both a social determinant and a medical factor. Research from the United Kingdom has shown that a limiting and longstanding disability of the mother has a negative effect on onset as well as breastfeeding duration (Sumilo et al., 2013). Besides, breastfeeding of a disabled child can be associated with social stigmatization from the social environment as well as the medical staff's side (Ryan et al., 2012). Both can impact the mother's emotional state and influence breastfeeding negatively (ibid). The social determinant was therefore divided into disability in mother and disability in child.

**6) Early life:** A social determinant based on the life-course approach (CSDH, 2008). It was excluded since it is already covered since the period under research ranges from birth to two years of age.

**7) Education:** Maternal educational level of the mother strongly determines her breastfeeding behavior (Lange et al., 2007; Hwang et al., 2006; Aryeetey & Goh, 2013). It is important since education is linked to the concept of health literacy, where health information/information on health benefits is easier to understand and process for educated than non-educated people (Kickbusch, 2001; Braveman et al., 2011). In Germany, the United Kingdom, and Ghana, information about breastfeeding is received during antenatal care (NHS, 2012; Nehlsen, E., 2014; Sagoe-Moses, 2014).

**8) Employment and working conditions/work:** Employment is shifted to unemployment since unemployment status can affect breastfeeding duration (Dubois & Girard, 2003). Employment related factors that might influence breastfeeding are grouped under working conditions and workplace regulation.

**9) Food (in-)security:** A social determinant indicating that a person is in a position to dispose over basic food supply meeting daily nutritional needs (CSDH, 2008) and mainly relevant for Ghana (FAO, 2009), where malnutrition is still prevalent. It can influence lactation negatively due to the lack of essential minerals, trace elements and proteins (Lawrence & Lawrence, 2011).

**10) Gender:** The gender/sex of the infant can play an important role since female infants may experience shorter breastfeeding periods than male infants (UN, 2011).

**11) Health services:** Medical care/health services play a crucial for breastfeeding success as outlined in the background chapter, and represent one social context from the Context-Mechanism-Outcome model to be tested. Therefore, it was discarded.

**12) Head of household:** Mothers living as one-parent families more commonly have lower breastfeeding rates than those living in two-parent families (Dubois & Girard, 2003). In Ghana, under-five mortality in children is significantly increased for single mothers compared to married/cohabitating mothers that could be amended through breastfeeding (Kanmiki et al., 2014).

**13) Housing:** This social determinant can be interpreted in different ways (Mikkonen & Raphael, 2010; Braveman, 2013). First, the environmental conditions inside the house play a role, like mold and lead painting, among others. Then the external physical environment, the neighborhood, can be influential by offering recreational spaces and assuring a fresh air quality due to greenery. Another important factor is the safety aspect, since issues with violence can be an important environmental stressor (ibid).

Regarding breastfeeding, the concept of neighborhood was extended according to findings from the literature. For the United Kingdom, neighborhood/residence is a relevant factor when assessing breastfeeding rates (ONS, 2011). Breastfeeding rates decrease with an increased index in neighborhood deprivation except areas with a high proportion of migrants (Oakley et al., 2013). As for Germany and Ghana, breastfeeding rates vary according to geographical location. In Germany, breastfeeding rates in the Western part (former Free Republic of Germany) are lower, but the duration of exclusive breastfeeding is longer compared to Eastern regions (former German Democratic Republic) (Lange et al., 2007; Liese et al., 2006). In Ghana there are also regional differences with the Volta/Southeastern region displaying the highest exclusive breastfeeding rates and the Northern part the lowest (Tampah-Naah & Kumi-Kyereme, 2013).

**14) Income and income distribution:** It is a measure common in research in the United States of America and Canada to determine economic disparities (Mikkonen & Raphael, 2010; Braveman et al., 2011).

In European countries and within the field of epidemiological research, economic inequalities are commonly assessed by socioeconomic status/SES. For Germany, according to the Federal Institute of Public Health (Robert Koch-Institute) SES is measured by income, education and occupational status (Lampert et al., 2013). In the United Kingdom, the basis for SES is standard occupational classification, measuring the current occupational status, as well as level of deprivation (ONS, 2010). In Ghana, SES is used as an equivalent measure, as well as a wealth index, an indicator developed for assessing household assets in less formal economies (Howe et al., 2008). The index measures quintiles ranging from poorest to richest

(ibid). In regards to breastfeeding, it is important because SES/wealth index has a general influence on living conditions and is known to be among the most influential factors for health status (Mikkonen & Raphael, 2010; Braveman et al., 2011).

**15) Parental leave:** Parental leave, and especially paid maternal leave determines the point in time when work has to be resumed by the mother and/or father. Extended periods of parental/maternal leave are therefore highly beneficial for breastfeeding rates (Skafida, 2012; Rouw et al., 2014). This is an important factor both in the United Kingdom, where parents are entitled to a short leave, and Ghana, with a maternal leave limited to eight weeks postpartum. In Germany, there is a prolonged parental leave in place and therefore this determinant likely less important.

**16) Polygyny:** During the background search literature, for Ghana the determinant polygyny was identified as a factor positively influencing the breastfeeding period (Issaka et al., 2014).

**17) Race:** In Germany, ethnic descent is measured through migration status or migration background (Schenk et al., 2006). A person is considered to have a migration background in the case of a foreigner having migrated her-/himself to Germany after 1949, all foreign nationals born in Germany, as well as those born in Germany having at least one parent that migrated her-/himself to Germany or was born as a foreign national (Statistisches Bundesamt, 2010). Race is a concept not applied as such in Germany. As for the United Kingdom, both race and ethnicity are used whereby ethnicity is the more common measure in epidemiological and health research (ESCR, 2013; ONS, 2014). In Ghana, the terms ethnicity as well as tribe are used interchangeably in health research (Tawiah-Agyemang et al.; 2008; Aborigo et al.; 2012).

**18) Religion:** Findings from the background search for relevant social determinants relevant for breastfeeding revealed that religion is an important factor in Ghana, whereby Christians tend to adhere more to breastfeeding recommendations than other religious groups (Aborigo et al., 2012). In Germany, the predominant religious groups are of Christian religion (protestant, catholic) followed by Muslim religion (BpB, 2012). In Great Britain, Christian religion accounts for the majority of the population followed by Muslims, who are the second biggest group (ONS, 2011). Thus, religion will be searched for all three countries.

**19) Social exclusion:** This social determinant refers to people affected by homelessness representing a highly vulnerable and marginalized group (CSDH, 2008). It will be excluded from the research because it is a rather small group with very special needs that surpasses the scope of this research.

**20) Social support:** In the area of breastfeeding, the social network of the mother can influence the breastfeeding behavior positively and/or negatively. Most importantly among those are father of infant, mother of mother, mother-in-law, and peers of mother who are known to

influence breastfeeding behavior (Aborigo et al.; 2012; Kroth, 1998; Tawiah-Agyemang et al.; 2008). For Ghana, research has shown that a compound leader is reported to be a main determining factor (Tawiah-Agyemang et al.; 2008; Aborigo et al.; 2012). A compound leader is the person who owns the compound and rents out to other families (Opoku, 2014). This social determinant will be added to the list as social networks.

**21) Social safety net:** It refers to social security insurance provided by the government in case of ill-health, disability, unemployment and retirement (CSDH, 2008). For this dissertation, coverage of maternal and child health services was a precondition for the eligibility of the countries to be researched. It will therefore be excluded.

**22) Stress:** Stress is important due to the release of stress hormones that can lead to a decreased lactation (Lawrence & Lawrence, 2011). Since it is a rather unspecific factor, it is grouped under a social determinant to that exposure to increased levels of stress are expected: working conditions.

**23) Transport:** Although transport plays a big role in regards to accessing health services, it was not found to be relevant for breastfeeding and was therefore disregarded.

**24) Unemployment:** Employment/unemployment status is an important determinant of health in general (CSDH, 2008). As already mentioned under employment and working conditions, breastfeeding rates are lower in families where both parents are unemployed (Dubois & Girard, 2003).

**25) Working conditions:** Working conditions per se play a role because of physical workload, shift work, the demand-control imbalance, and the effort-reward imbalance that possibly increases stress levels (Marmot & Wilkinson, 2003; CSDH, 2008; Siegrist, 2002; Mikkonen & Raphael, 2010; Braveman et al., 2011). Increased stress levels are known to lead to elevated hormonal stress levels, that in turn can inhibit the milk flow and therefore influence breastfeeding (Lawrence and Lawrence, 2011).

**26) Workplace regulation:** Other important aspects regarding work are the national workplace policies implemented at the institutional level facilitating breastfeeding when women resume their jobs after maternal leave terminated (Gauthier-Loiselle, 2013).

### **5.1.3 The Context-Mechanism-Outcome Model**

The above outlined social determinants display a big variety. In public health research, social determinants have been divided into proximal and distal, with the first category relating to biological components and direct exposure, and distal for determinants located at the societal level to explain the effect and understand causal pathways of exposure and disease causation. However, Krieger (2008) argued that this divide leads to a simplified and skewed perspective of causality in pathways, but suggests to instead adopt an “[...] explicit language

about levels, pathways and power.” (Krieger 2008: 221). Therefore, the model developed by Rollins et al. (2016) where determinants of breastfeeding were allocated to the individual, the settings and structural level was adopted and slightly modified.

In order to structure the social determinants at hand and therefore enhance the understanding of where and how they take effect, the model of Elkeles & Mielck (1997) and Steinkamp (1999) was used. This model divides society into three layers, the micro, meso and macro level (Steinkamp 1999). The micro level is situated around the individual and describes where individual factors are important like gender, educational level, age and where personal behavior is displayed (Elkeles & Mielck, 1997; Babitsch, 2005). The meso level is equivalent to the institutional level/organizational unit, whereby the term institution conceptually embraces an institution like a hospital or the workplace as well as personal organizational units like the family. The macro level serves as an umbrella and frames the social context regarding norms and values, but also where policies with legal effects are launched (Krieger, 2008). Norms and values therefore shape breastfeeding attitudes, but are more effective in combination with breastfeeding policies, e.g. the workplace are in place.

The first group consists of all social determinants of breastfeeding that are considered to be located at the individual level, in this case either the mother or her child. They are: age of mother, maternal educational level, SES/wealth index, head of household, employment/unemployment status of parents, migration background/ethnicity/tribe, gender of infant, disability of mother and infant, geographical location, and food security. The next layer at the meso level consists of social determinants taking effect in social institutions: working conditions, the social network, like family members and/or peers and polygyny (Ghana). Following the direction upwards, the macro level represents norms and social values, as well as the policy level. The norm and values-related social determinants are culture and religion, and in regards to policies those that regulate breastfeeding at work and parental/maternal leave. Please note that as for Germany and the United Kingdom in total 16 determinants were part of the C-M-O model, but for Ghana food insecurity and polygyny were added resulting in 18.

As described earlier, results from the background search were then built into the Context-Mechanism-Outcome model. Hence, Context represents the social context where breastfeeding takes place, Mechanism those social determinants that are relevant for breastfeeding and the Outcome the breastfeeding period.

C: Community – M: Social determinants of breastfeeding – O: Breastfeeding

Out of this model, one question per social determinants was constructed following the pattern: which social determinant has what effect on the respective breastfeeding period in which social context? The complete set of questions can be found in the annex (C4). As an

example, the first social determinant, maternal age, the question to be tested would read as follows:

**Question 1: How does maternal age influence the breastfeeding period in the given social context in Germany/the United Kingdom/Ghana?**

**Table 3: Context-Mechanism-Outcome Model for Question-Testing**

Context		Mechanism	Outcome
Model	Social context of breastfeeding	Social determinants relevant for breastfeeding	Breastfeeding period
<b>Micro level: influence at the individual level</b>			
Social context of breastfeeding	Maternal age	Breastfeeding period	
	Maternal educational level		
	SES (GER, UK)		
	Wealth index (GH)		
	One- parent family		
	Employment/unemployment status of mother		
	Employment/unemployment status of father		
	Migration background (GER)		
	Ethnicity (UK)		
	Ethnicity/Tribe (GH)		
	Gender of infant		
	Disability of mother		
	Disability of infant		
Geographical location: West/East: GER Neighborhood/residence: UK Rural/urban region: GH			
Food insecurity (GH)			
<b>Meso level: influence at the institutional/organizational level</b>			
Social context of breastfeeding	Social networks: Father of infant Mother of mother Mother-in-law Peers of mother Compound leader (GH)	Breastfeeding period	
	Working conditions		

Context	Mechanism	Outcome
New		
Social context of breastfeeding	Polygyny	Breastfeeding period
<b>Macro level: influence at the societal level</b>		
Social context of breastfeeding	Culture: Attitude towards BF	Breastfeeding period
	Religion: Christian, Muslim, Traditional (GH)	
	Breastfeeding policy/regulation at workplace	
	Paid parental/maternal leave	

#### **5.1.4 Preparation of the Second Search**

The second search was then conducted adhering strictly to the criteria of a systematic search in order to assure transparency when searching for a wide range of sources (Pawson et al., 2005; Greenalgh et al., 2011; Rycroft-Malone et al., 2012). The sampling strategy for the search was purposive (Rycroft-Malone et al., 2012). Since it was necessary to identify the potentially relevant literature from a broad variety of sources in a comprehensive manner, the leading criterion for the search was sensitivity.

“Sensitivity is defined as the number of relevant reports identified divided by the total number of relevant reports in existence.” (Lefebvre et al., 2008:130)

In order to make sure that all pertinent sources from the three countries under research are included in the search, key expert interviews were recommended by both the second supervisor (UL), as well as in the manual of Wong et al. (2013). Conducting expert interviews is therefore a means of quality assurance for the comprehensiveness of the search that all relevant sources, databases and documents are accessed (Wong et al., 2013).

The aim of the Realist Review is to conduct a comprehensive search. Main elements are therefore borrowed therefore from the systematic review methodology (Wong et al, 2013). These are the steps to be undertaken according to the manual of Wong et al. (2013):

- Conduct key expert interviews for identification of relevant sources (databases, journals, search engines, website)
- Develop a PICO (Population, Intervention, Comparison, Outcome) scheme
- Develop search terms
- Combine search terms with BOOLEAN operators
- Define limitations of last retrieval date/end of search
- Conduct the search
- Import references in a library created by software Endnote
- Hand search of journals where necessary and provide copies in an electronic format

#### **5.1.5 Development of a PICO Scheme**

McMahon & Ward (2012) adapted the PICO elements from the Cochrane Health Promotion and Public Health Field: the PICO (T) scheme with P = Population, I = Intervention, C = Comparison, O = Outcome and T = Type of study. For the dissertation, the Context-Mechanism-Outcome models were translated into a PICO scheme.

The population was defined as mothers and their children that can be breastfed. The intervention was defined as factors influencing breastfeeding, represented by the social determinants. Since social determinants are not an intervention per se, this part was renamed as

influence. The search was restricted to the specific countries (Germany, the United Kingdom and Ghana). Inclusion and exclusion criteria were predefined and completed during the search. As suggested by Pawson (2006), the study type was defined as primary research. As for the relevant publication period, the recommendation to limit results to a 10-year period from the key expert for breastfeeding in Germany, Ms Nehlsen, was applied at first, but during the search prolonged to 20 years.

Two populations were defined for this research: mothers and their babies that can be breastfed. Regarding age restrictions, for mothers, no age specification was necessary, but for children, their population was defined as children aged 0-2 years thus covering the recommended breastfeeding period. As already mentioned in the background part, there are medical factors that impede and/or inhibit establishing successful breastfeeding as in the case of prematurity in the infant (gestational age <32 weeks or a birth weight <1500g), whereby essential physiological reflexes like sucking are not fully developed yet. Besides, the occurrence of certain diseases and conditions contraindicate breastfeeding due to the risk of transmitting an infection like in the case of HIV and HTLV I and II, as well as the condition of galactosemia, the inability to digest the sugar component in breast milk (Lawrence & Lawrence, 2011). The medical factors stated here were not applicable for Ghana, since the risk of a HIV positive mother to transmit the infection through breastfeeding can be substantially reduced by a proper lactation management and clearly outweighed by the risk for the newborn/infant to die from an infectious disease like diarrhea and/or pneumonia (WHO, 2010). Since the focus was first on infants that receive any breast milk, the exclusion criteria for the infant population were newborns with a very low birth weight (< 1500g) or very preterm (gestational age < 32 weeks). However, the infant population had to be modified after the first screening to babies that could actually be fed on the breast (birth weight  $\geq$  2500g and  $\geq$  36 weeks of gestation).

Three PICO schemes were then developed and tested. The first PICO had a classic design, but yielded no search results. The combination of too many components proved counterproductive to a sensitive search strategy. The PICO was then adapted to the methodological approach from McMahon and Ward (2012), neither too restrictive nor too specific. This version resulted in 53,480 hits. The third PICO was a modification of both and is described below.

In order to restrict the number of search results for the finalized PICO(T), the Population and Intervention remained the same: P = mothers and their babies that can be breastfed, Intervention = Social Determinants, and the O(utcome) breastfeeding was added to the search. The breastfeeding period per se was not differentiated further in the search, but at a later stage during the course of analysis. The social contexts of breastfeeding were also not part of the search terms, but of the analysis.

**Table 4: PICO Aspects with Descriptions**

PICO aspect	Description
Population	Mothers and their babies that can be breastfed Mütter und ihre stillfähigen Kinder
Intervention (Influence)	Social Determinants Soziale Determinanten
Outcome	Breastfeeding
Type of study	Primary research
Country	Germany /United Kingdom/Ghana Deutschland
Relevant publication period	No restriction

The next step was to conceptualize the different aspects of the PICO scheme into terms that can be searched for. They were then paraphrased reflecting the conceptual meaning of the key components using the internet version Thesaurus.com (2014). This search yielded 122 results. The finalized PICO(T) scheme and the search components served as a blueprint for all questions to be tested, but were subject to further modification during the search and screening procedures.

### 5.1.6 Building the Search Strategy

The following inclusion criteria were preliminarily defined:

- All documents containing information on the social determinants of breastfeeding
- All study designs including symposia and meetings' references, but only if they are related to a published and/or retrievable publication
- Area: the countries under research are topic of each search
- Language: studies in English (all three countries) and German (Germany)

After discussing the inclusion and exclusion criteria for the search and screening with supervisors and reviewers, few amendments were undertaken.

The search for Germany generated study designs with secondary data analyses that appeared suitable for inclusion in the analysis. After consulting the second supervisor (UL), the study design of primary research studies was changed to original research studies. Moreover, any type of reviews including systematic reviews was decided to be eligible for inclusion given that they were limited to Germany, the United Kingdom, or Ghana and was hand-searched thereafter. For Germany, studies were retrieved in both English and German. The publication period restriction was later expanded to 20 years. The finalized inclusion criteria

were then type of study (original research study), study participants were determined as mothers and their children that can be breastfed. Mothers had to be excluded in case they had a viral infection with either HIV or HTLV I or II, with the exception for the maternal population of Ghana. In case of the child/children, gestational age at birth should not be less than 32 weeks, and birth weight below 1500g. Regarding the type of intervention, all studies that dealt with the social determinant affecting the breastfeeding period were included, and breastfeeding had to be either primary or secondary outcome. The geographical area was restricted to Germany, the United Kingdom and Ghana, and no restrictions for the publication period.

### **5.1.7 Amendment of the Search Strategy**

The search strategy was then built and discussed with the second supervisor (UL), and additionally revised by Dr. Menzel, the senior librarian at Charité Universitätsmedizin. In order to scale up results, the decision was taken by the author to **a)** apply a broad search strategy as recommended by Pawson (2006), Mc Mahon & Ward (2012) Mc Cormack et al. (2013), and **b)** to sort results by hand as advised by UL. Thus, the population 'mother and her child that can be breastfed' was not part of the search strategy since it is implicit in the outcome breastfeeding. Besides, the publication period of ten years had to be removed in order to achieve comprehensiveness, but research about social determinants and their influence on breastfeeding conducted 30 years ago was not current due to historical and societal changes and therefore the publication period limited to 20 years.

The final search strategy served as a blueprint for the three searches in the countries under research.

### **5.1.8 Identification of Suitable Literature Sources**

Key expert interviews for all three countries were conducted to verify suitable sources for the search (annex A1), and search protocols were carefully issued (annex A2).

The first interview was conducted for Germany with a reknown breastfeeding expert, Ms Nehlsen. She is the founder of the training center for lactation and breastfeeding as well as advocating on breastfeeding promotion in Germany since the early 80s. Ms Nehlsen recommended to search for literature in the electronic databases PubMed and DIMDI (Deutsches Institut für Medizinische Dokumentation und Information), and the database from the University of Bielefeld, as well as internet search machine Google Scholar. As for journals, she proposed *Bundegesundheitsblatt-Gesundheitsforschung-Gesundheitsschutz*, *Deutsche Hebammenzeitschrift*, *Die Kinderkrankenschwester*, *Laktation und Stillen/ELACTA*, and the *Journal of Human Lactation*. Websites from the following institutions were also suggested by her: Ausbildungszentrum für Laktation und Stillen, Bundesinstitut für Risikobewertung, Academy of Breastfeeding, European Association for Breastfeeding Consultants

(VELB/ELACTA), Deutscher Hebammenverband, Arbeitsgemeinschaft Freier Stillgruppen, Runde Tisch zur Stillförderung in Deutschland, Aktionsgruppe Babynahrung Göttingen, and the WHO/UNICEF website. Regarding congresses, she proposed the Deutscher Stillkongress and the Symposia für's Stillen.

For the United Kingdom, Prof. Hoddinott, Chair in Primary Care at the University of Stirling, Nursing Midwifery and Allied Health Professionals Unit was interviewed. She recommended the electronic databases OVID, Medline, SocIndex, PsychInfo®, and the Cochrane database. Regarding journals, she gave no recommendation, and for institutional websites she proposed Vital Signs, Health and Social Care and UNICEF UK.

For Ghana, it was anticipated that it would be difficult to detect studies on breastfeeding. Four interviews with the following key experts were therefore conducted: Dr. Isabella Sagoe-Moses, National Coordinator of Ghana Health Services, Department of Child Health, Ms Tawiah-Agyemang, researcher at the Kintampo Health Research Center, Dr. Tampah-Naah, researcher at the University for Development Studies/University of Tamale, and Dr. Folson, researcher at the Noguchi Memorial Institute of Medical Research, University of Ghana. They recommended four electronic databases: Biomed Central, PubMed, Scopus, and Science Direct, the internet search machine Google Scholar, and the International Breastfeeding Journal. Besides, the databases from the four health research centers located in different regions in Ghana were proposed - Kintampo (Ashanti Region), Navrongo (Northern Region), Dodowa (Greater Accra Region) and Noguchi (Accra Metropolitan Area), as well as the databases for master and doctoral theses of the University of Ghana Medical School and the School of Public Health, University of Ghana. It was further suggested to search the websites from Ghana Health Service, the IBFAN Ghanaian group, the Ghana Demographic and Health Survey, and the Linkage Project.

### **5.1.9 Conduct of the Second Search and Screening Procedures for all countries**

The second search was therefore basically limited to the literature sources stated by the key experts. Hence, they display a wide variety as demonstrated in the flowcharts figure 9 for Germany, figure 10 for the United Kingdom and figure 11 for Ghana. A search protocol for more detailed information on the search is added to the annex (A2).

The second search started with the country Germany. The search was conducted in the period of July to October 1, 2014, the final date of retrieval in the databases recommended by the key expert for Germany outlined in chapter 5.1.8. and was performed in such a way that each database was searched individually for all social determinants. However, this procedure proved to be very time consuming and rendered many duplicates. Therefore, the procedure was not repeated for the United Kingdom and Ghana. For Germany, national databases were searched in German and English, but grey literature such as websites from recommended

institutions were found only in German language. For the search in Google Scholar, a problem occurred when downloading citations into Endnote. Despite filling the CAPTCHA correctly as requested to identify as a human and not a robot performing the search, the Internet Protocol address of the internet access used to search Google Scholar was blocked. Since the search could not be continued with Google Scholar, it was replaced by two electronic social sciences databases, SOWIPORT and SocINDEX. No further studies except two from the systematic review were included thereafter. A total of eight electronic databases and one personal contact resulted in 5,047 records with 1,901 duplicates. There were no search results from website, and the hand search of two journals, one for pediatric care and the other one for midwifery, in the Charité library yielded 82 results. They were electronically scanned for the purpose of screening and archiving. A total of 3,228 records were eligible for the first screening by title and abstract. The first screening resulted in 216 records eligible for the second screening plus ten systematic reviews that had been identified. The second screening led to the exclusion of 192 records, and two studies from systematic reviews had been selected and were hand searched subsequently, thus 26 studies in total. The three main reasons for exclusion during the second screening were that studies had used outdated data or were outdated themselves, then based on the ground that there was no information provided on the relationship between the social determinant and breastfeeding, and finally that breastfeeding was not the outcome in the study. Further information is provided in the annex (B1 and B2).

Screening refers to the procedure of selecting studies and is usually carried out in two stages (Lefebvre, 2008). During the first stage, all identified sources were examined by title and abstract. The literature sources that were selected during the first screening were then assessed in their full-text versions. After having completed the two screenings, a third one became necessary to assure that only studies with the predefined child population entered the analysis. A post cut-off after the first screening was applied for publications before 1990. For all three countries, research prior to 1990 had to be considered as outdated, since the significance from results in view of societal changes in the past two and a half decades had to be questioned. In order to assure comparability of results and enhance comprehensibility, the flowchart of Germany was adapted.

It is noteworthy to mention that only one article from the 81 results from the *Kinderkrankenschwester* and the *Hebammenzeitschrift* qualified as an original research article. The second screening was also performed per determinant. The pretest for analysis of the selected studies revealed that especially the child population was not properly defined, and in one case breastfeeding was not the outcome of the study as presumed. Therefore, a third screening had to be performed, leading to the exclusion of another 18 studies. The final result was eight studies suitable for analysis.

Figure 9: Search and Screening Process for Germany

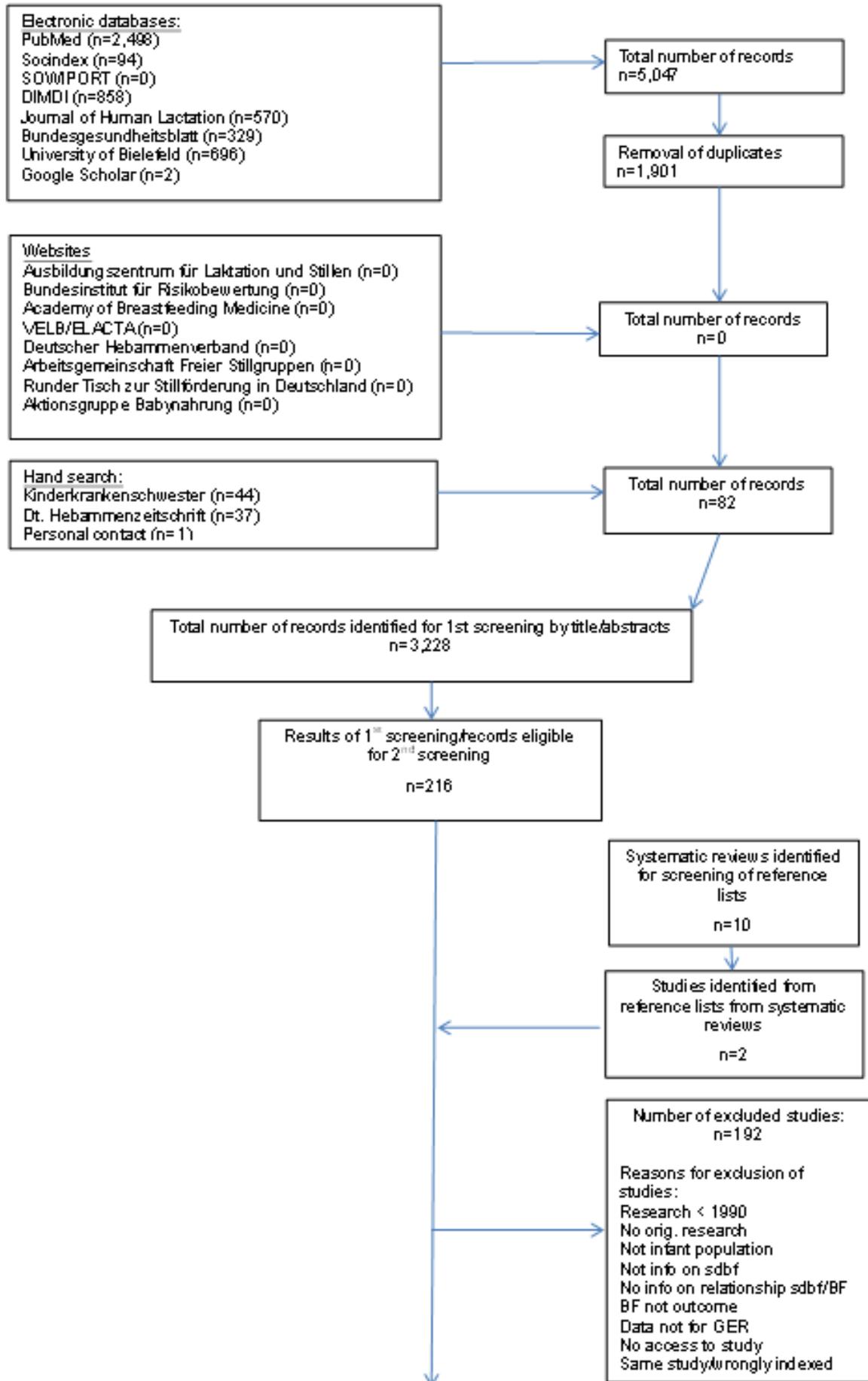
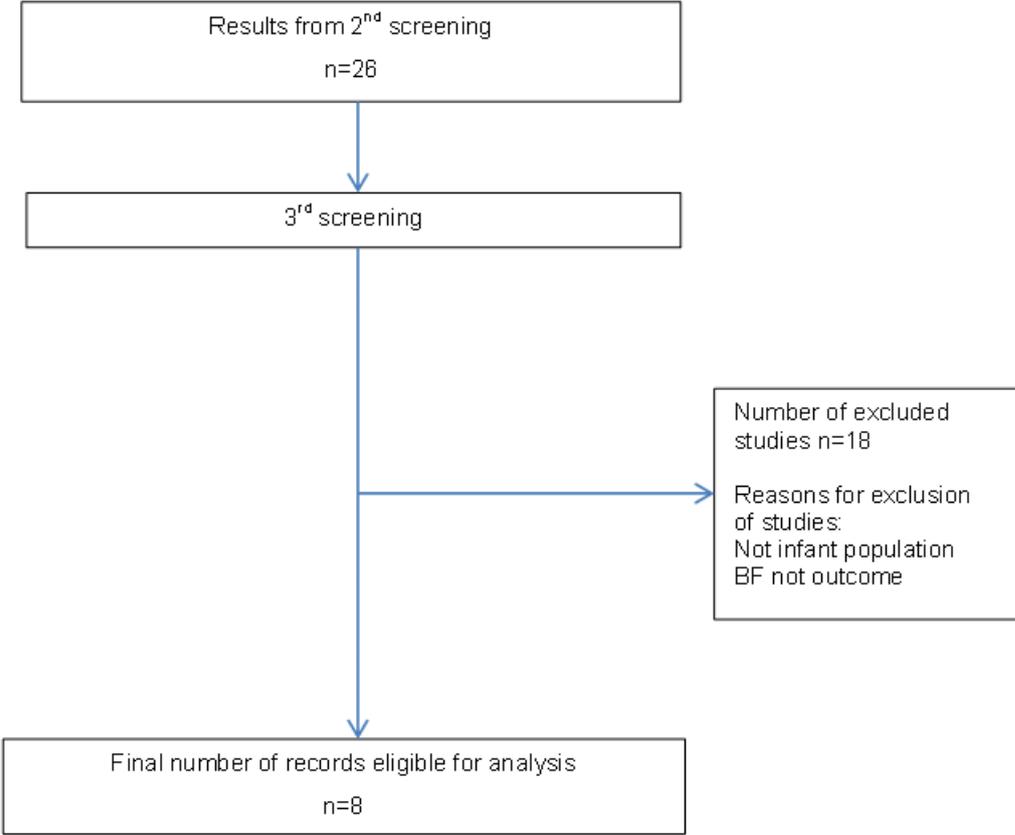


Figure 9 cont.: Search and Screening Process for Germany



For the United Kingdom, the search was performed during November and December 2014, with the last day of retrieval December 11, 2014 in the databases recommended by the key expert for the United Kingdom, as outlined in chapter 5.1.8. No further studies were added except for the four derived from the systematic reviews. Four electronic databases were searched for the United Kingdom: Ovid Medline, SocIndex, PsychInfo, and Cochrane database yielding 4,595 results, with 1,214 duplicates. Hence 3,381 literature sources were subject to the first screening and led to 74 results that entered second screening. Two records were not accessible and four studies from six systematic reviews seemed eligible for analysis. Another 48 studies were excluded mainly because data or studies were outdated, no information provided on the relationship between the social determinant and breastfeeding, and breastfeeding was not the outcome. Again, all details can be viewed in the annex (B1 and B2). This led to 26 records that were then screened for a third time, leading to the exclusion of another 15 records. Thus the final number of studies of the United Kingdom that entered analysis was 11 studies.

Figure 10: Search and Screening Process for the United Kingdom

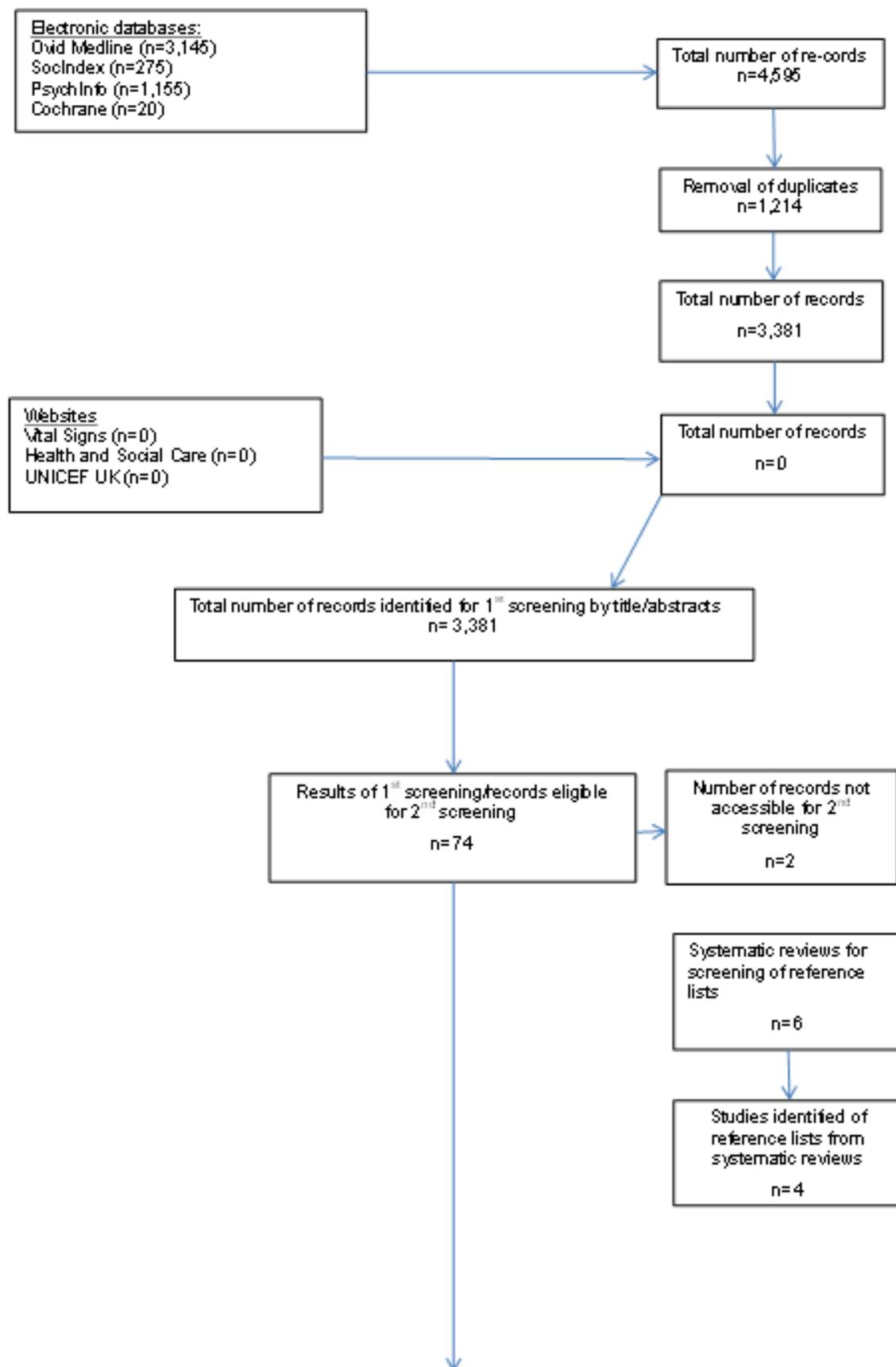
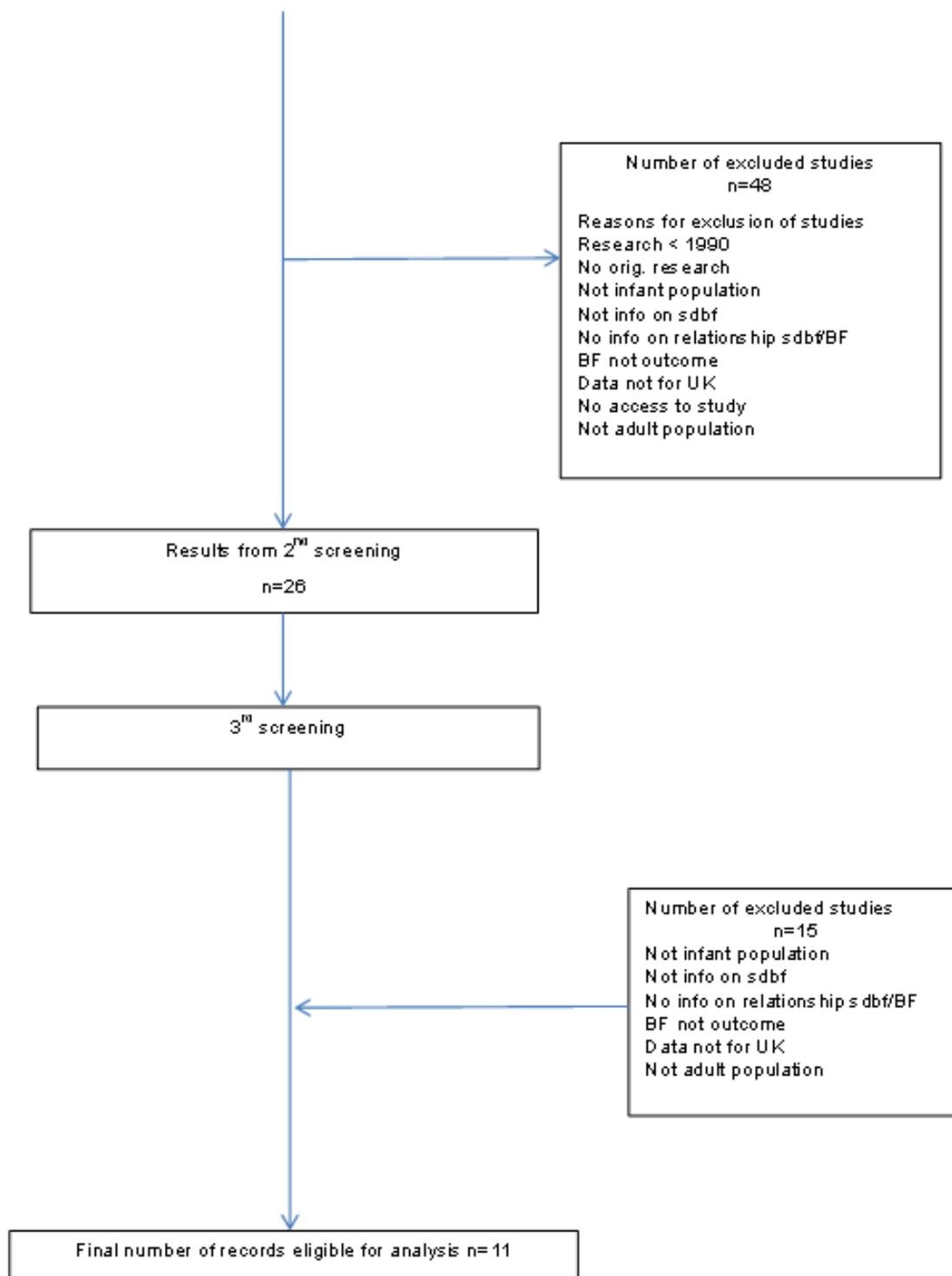


Figure 10 cont.: Search and Screening Process for the United Kingdom



The search for Ghana was conducted during October 2014 with the final date of retrieval October 27, 2014. The search was restricted to the databases recommended by the key experts for Ghana outlined in chapter 5.1.8. A search protocol for more detailed information on the search is provided in the annex (A1). The electronic database search in PubMed, Biomed Central, Scopus, Science Direct, SocIndex, and the *International Breastfeeding Journal* yielded 14,575 results. After the removal of 811 duplicates and of 2,940 records through preselection inside the database, a remainder of 10,834 was left for the first screening. Additionally, eight records from websites of different institutions and projects were retrieved. One record was not accessible, so that a final number of 10,831 records were screened by title and abstract. This resulted in 86 records eligible for the second screening, from which five were not accessible. Three systematic reviews that had been identified for the screening of the reference lists, but no record was qualified for analysis. A total of 69 sources were rejected due to the same reasons as for the other countries, but mainly because of the fact that breastfeeding was not the outcome of the study, no original research, and no information on the relationship between the respective social determinant and breastfeeding, leading to a final number of twelve studies. Tables containing further information are provided in the annex (B2). Due to the fact that the infant population did not meet the predefined area and because the data were not disaggregated for Ghana, a third screening had to be performed. This led to six studies from Ghana eligible for analysis.

Figure 11: Search and Screening Process for Ghana

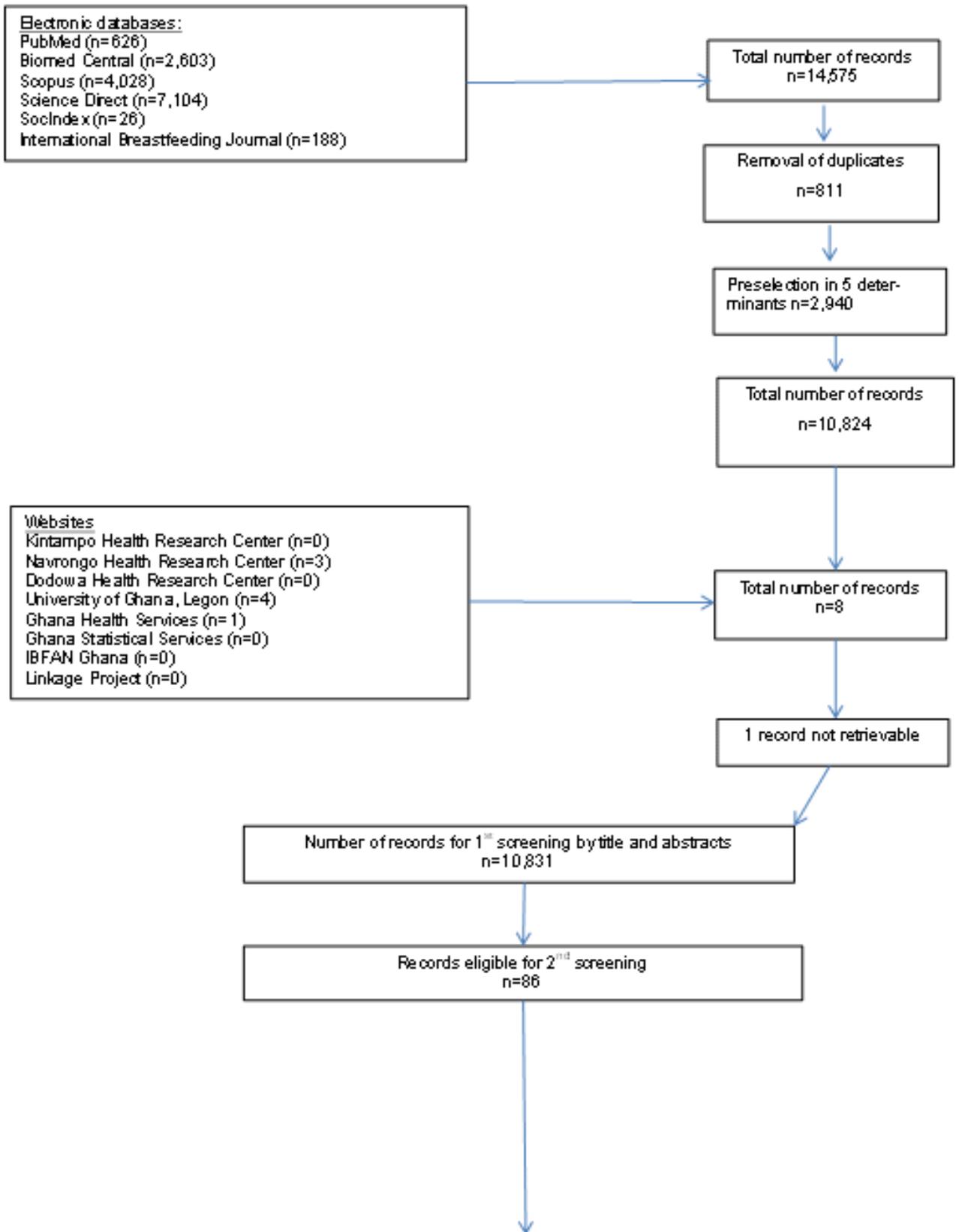
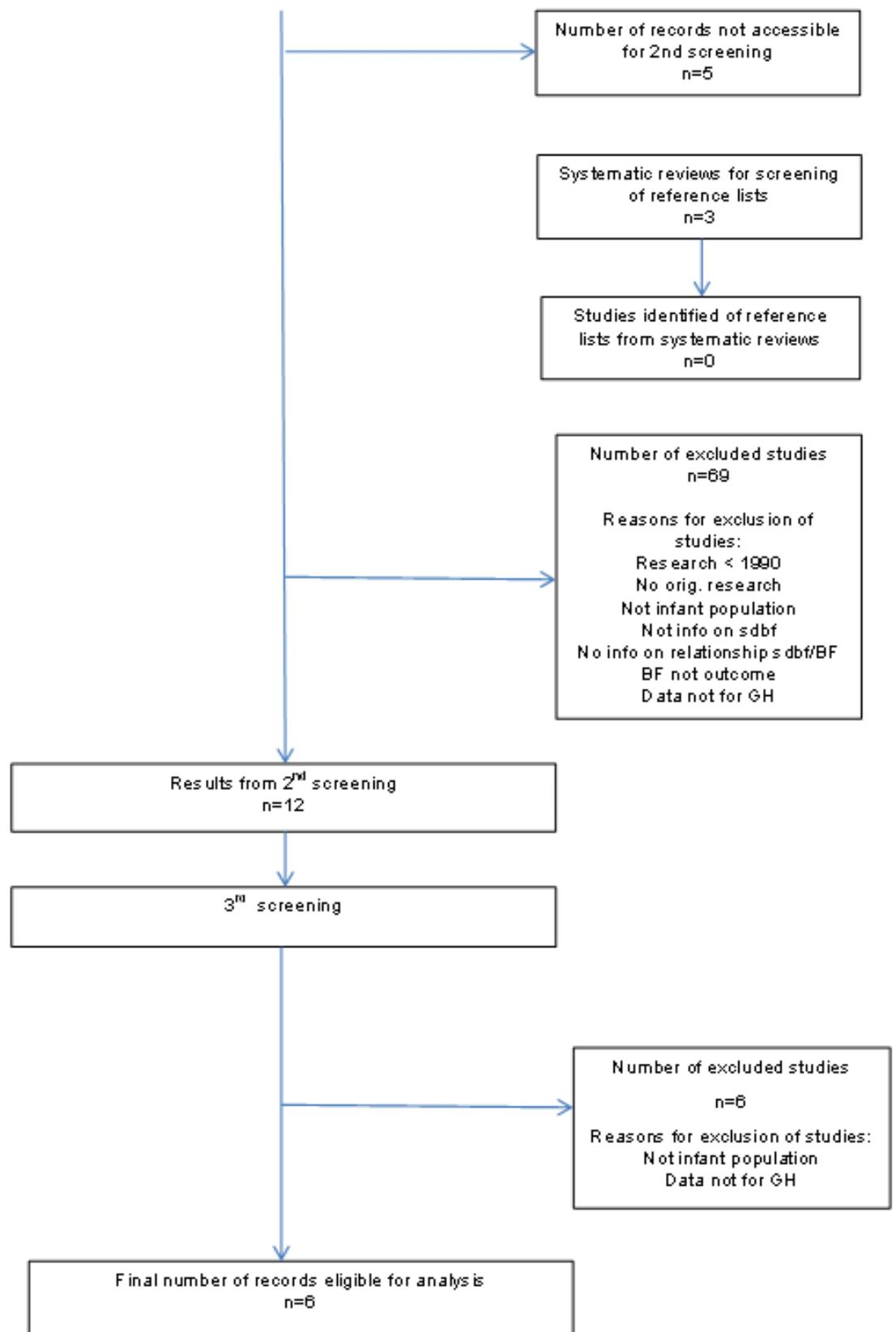


Figure 11 cont.: Search and Screening Process for Ghana



### **5.1.10 Quality Assurance for the Screening Process**

A prerequisite to assure quality and transparency in systematic reviews is a second reviewer that conducts the screenings as well as the assessment for the evidence (the Cochrane Collaboration, 2012). This procedure was adopted for the Realist Review.

For Germany, CLB, with a Master of Science in Epidemiology employed at the Robert Koch Institute and experienced with systematic reviews served as a second reviewer, for Ghana, DO, Master of Science in Public Health, Doctor of Public Health candidate at the Technical University Berlin. Familiar with the methodological approach, most importantly he has a Ghanaian background, so he served as a second reviewer and expert for the country. For the United Kingdom, NS served as second reviewer. She is a trained midwife, holds a Master of Science in Public Health and is currently enrolled in a PhD program in midwifery sciences at the University of Central Lancashire in the United Kingdom. She is an expert in breastfeeding and lactation, and contributed substantially regarding inclusion criteria for reference levels of birth weight and gestational age of the newborn. All search results were screened by both reviewers independently, and none of the reviewers was blinded to results from the respective other reviewer. Disagreements on whether to include the study or not were discussed for each abstract individually until consent could be reached following the criteria established through the screening questions and the previously determined selection criteria. In contrary to the author of this dissertation, the two reviewers CLB and DO are not professionals in the area of breastfeeding. This adds to the quality of the review, since expert knowledge may blind towards unexpected results and thus may favor bias (Cochrane Collaboration, 2012).

Besides, an interrater reliability (IR) was calculated in order to quantify the reliability of the screening process. Since two reviewers per country and three categorical variables - yes/no/unsure – were involved, Cohen's kappa coefficient was chosen to assess concordance of the ratings (Grouven et al., 2007). The kappa coefficient is a measurement for assessing the concordance between two more raters according to their actual and their estimated concordances when assessing the same data. Since the same rating can be the result of chance, there is need to estimate this probability.

Therefore, observed and estimated concordances are calculated as follows with  $k$  representing Cohen's kappa,  $P_o$  are all observed concordances and  $P_e$  all estimated concordances (Grouven et al., 2007).

$$k = \frac{\sum P_o - \sum P_e}{1 - \sum P_e}$$

### 5.1.11 Performance of the First Screening

For the first screening, a set of questions was developed, that was later modified for the second screening.

#### Set of questions for 1st screening:

The questions below should be answered with either yes, unsure or no. In case of an answer yes or unsure, the study was included, in case of no, the study was excluded.

1. Does the article deal with a primary research study?
2. Did the study include mothers and their infants (0-2 years) that can be breastfed?
3. Did the study exclude mothers who are HIV/HTLV I and II positive and babies that are preterm (< 32 weeks of gestation and/or < 1500 g birth weight)?
4. Did the study include any social determinant of breastfeeding respectively/one at a time?
5. Did the study include any breastfeeding-related period (onset, duration of exclusive breastfeeding, duration of total breastfeeding period)?
6. Did the study take place either in a health services setting (antenatal care, obstetric care, postnatal care) or community setting?
7. Did the study take place in the respective country under research?

The first pretest was carried out for Germany. From 122 screened abstracts, there was disagreement on twelve. After discussing the different assessments, they were able to conclude on all studies regarding in- or exclusion. Basically they agreed that all abstracts that contain maternal age as a variable had to be included. The result of the pretest was discussed with the second supervisor UL, who agreed to the way the pretest was conducted. Pretests were then conducted for the United Kingdom and Ghana. For the United Kingdom, a pretest was carried out with 28 studies with disapproving in 7. Disagreements were solved by discussion. For Ghana, from 50 studies, for disagreement for five studies was concluded by discussion.

For all three countries, electronically available references were imported with the reference manager software Endnote (annex B1). Those that were not, were scanned and added to the

annex (B1). The results of the systematic reviews were searched by hand for studies that relevant for the respective to the country.

### **5.1.12 Performance of the Second Screening**

The modified set of questions for the first screening was not identical for the second screening. Questions 3 and 4 were modified. NS objected to the definition of infants that can be breastfed, and so the age of the infant population was raised from week 32 of gestation to week 36 of gestation, as well as birth weight from 1500g to 2500g respectively. CLB insisted that the question regarding the social determinant of breastfeeding had to be more specific in order to exclude studies where they interact as confounders, and only include those with an explicit relationship between the corresponding social determinant of breastfeeding and the outcome breastfeeding period. In regards to study type, multi-country studies were included under the condition that results were stratified for the respective country.

#### Modified set of questions after conducting the 1st screening:

1. Did the study take place in Germany/the United Kingdom/Ghana?
2. Does the article deal with an original research?
3. Did the study include mothers and their infants that can be breastfed?
  - a. Were mothers who are HIV/HTLV I and II positive excluded? (only Germany/United Kingdom)
  - b. Were babies that are preterm excluded (< 36 weeks of gestation and/or < 2500g birth weight)?
4. Did the study include any social determinant of breastfeeding respectively/one at a time (not as a confounder)?
5. Did the study include any breastfeeding-related period (onset, duration of exclusive breastfeeding, duration of total breastfeeding period) and is there a relationship between the social determinant and breastfeeding?

Studies that had been screened for a certain determinant containing information on another social determinant were added accordingly.

### **5.1.13 Performance of the Third Screening**

A third screening for all countries was conducted in order to rest-assure the appropriate infant population. The main focus was laid on the description of the study population and the criteria that needed to be fulfilled in terms of description. For national cohort studies, study protocols were available online and inclusion criteria could be verified. For smaller studies of quantitative research design and especially qualitative research design, the population was often not thoroughly described and no further information was available. In order to not exclude all studies, the decision was taken to include those where the information is available

and to mention the possibility of a preterm population as a confounder if no detailed information was available.

The study protocols of national databases revealed that all children regardless of gestational age at birth were included for analyses. This proved true for the KiGGS (Kinder- und Jugendgesundheitssurvey) database from Germany, and was later confirmed by the researchers, as well as the Ghana Demographic and Health Survey (GDHS), that was also confirmed by the researchers, as well as the AVON Longitudinal Study of Parents and Children (ALSPAC) and the Millenium Cohort Study (MCS) for the United Kingdom, where no feedback was provided from researchers. This procedure led yet to another reduction in final results for analysis: Germany n = 8 studies; Ghana n = 6 studies and United Kingdom n = 11 studies. For further details, please refer to the flow charts.

#### **5.1.14 Data Analysis of Selected Studies**

The next step was to analyze the selected studies in two ways: first, an overall assessment of study quality and second, a realist synthesis.

Data were then extracted into a template had been elaborated beforehand. It contained the criteria relevant for the quality that were developed further during the pretests. It started with aim of the study, study population, study design including sampling and method of data collection and data analysis, the social context, the social determinant and that was investigated, the breastfeeding period, funding, comments on quality reporting versus conduct of study and finally the overall assessment. The final version was concluded with the second supervisor (UL).

#### **5.1.15 Quality Assessment of Analyzed Studies with SIGN**

For the quality assessment, the author of the manual for a Realist Review (Wong et al., 2013), was contacted via email to inquire for criteria concerning the quality assessment. He suggested looking at how the study was conducted, and then evaluating the quality accordingly (Wong, 2014). Instead, a scheme for quality assessment was developed based on criteria of the Cochrane Collaboration (Higgins & Altman, 2008), and advice from the second supervisor (UL).

For the quality of the study, the description and intelligibility of the reporting was appraised, as well as the conduct. The following points were taken into account for each analysis:

1) Description of population (esp. gestational age of infants), 2) biases mentioned (selection and information bias), 3) confounder taken into account: a priori defined as 3. a) intention to breastfeed, b) maternal smoking, c) parity, d) mode of delivery, e) early infant-to-breast contact, f) early pacifier use, g) supplementary feeding, and the social determinants of breastfeeding that were not subject of the research. In qualitative designs, the concept of con-

founder was not applied, and therefore left to concluding whether they were mentioned or not.

The overall assessment/ranking of the study quality was based on the methodology checklist of the Scottish Intercollegiate Guideline Network (SIGN) methodology checklist (SIGN, 2014). It was therefore ranked as follows: high quality (++) : majority of criteria met; little or no risk of bias; acceptable (+) : most criteria met; some flaws in the study with an associated risk of bias; low quality (-) : either most criteria not met, or significant flaws relating to key aspects of study design and the last reject (0) was not applicable since studies had already been discarded during the screening procedure. Tables with extraction of data for the study descriptions and quality assessments are added in C1. Study descriptions themselves are added at the end of this thesis in the annex (C3).

#### **5.1.16 Pretests for Analysis**

For each country, a pretest with the respective reviewer was conducted. Five studies of varying study design (qualitative research, quantitative research, and mixed methods) were chosen and assessed individually.

The analysis started with the United Kingdom. Two studies from the social determinants maternal age (Oakley et al., 2014; Oakley et al., 2013), and one each for SES (Brown et al., 2010), culture (Sittlington et al., 2007) and religion (Williamson & Sacranie, 2012) were analyzed. For the quality assessment, biases and confounders should be taken into account followed by how the analysis was conducted. The later point was dismissed thereafter since its interpretation was not the primary aim of the research.

The second pretest was carried out for Ghana. Studies for the following social determinants were selected: maternal educational level (Aidam et al., 2005), social networks (Aborigo et al., 2012), working conditions, workplace regulation (Danso, 2014), culture (Tawiah-Agyemang et al., 2008), and lastly, polygyny (Gyimah, 2009). Danso (2014) was chosen because it is a mixture between a regular publication and a research report. Gymiah (2009) had to be excluded post-analysis because it is based on Demographic and Health Survey data that include all infants irrespective of gestational age. The focus in this pretest was on how to extract the data for qualitative research and to understand the findings in terms of the cultural background of Ghana.

Germany was the last country for a pretest. For maternal age Bergmann et al. (2002), for maternal educational level Dulon et al. (2001) and Libuda et al. (2014), and for employment Keller & Demuth (2006) were analyzed. Keller & Demuth (2006) was the only study with a qualitative research design, but unfortunately had to be excluded due to the fact that the breastfeeding periods were not specific enough. A term paper from an IBCLC that applied mixed methods but had included preterm infants had to be discarded. In this pretest, the em-

phasis was laid on the quality assessment and thus the relevant criteria discussed that should be addressed for the analysis, mainly the different forms of biases, confounders versus interacting variables and finally method of analysis.

In agreement with the second supervisor (UL), all identified social determinants of breastfeeding that were not part of the research should be taken into account as confounders, too. The decision was therefore taken to first look for the a priori defined confounders, such as a) intention to breastfeed, b) maternal smoking, c) parity, d) mode of delivery, e) early infant-to-breast contact, f) early pacifier use, and g) supplementary feeding. For qualitative research designs, the question was whether social determinants had been addressed or not. Finally, in order to adhere to a precise assessment, the decision was taken to differentiate between reporting of study and actual conduct of study as recommended by the Cochrane Collaboration (2012).

### **5.1.17 Extraction of Data and Realist Synthesis of Results**

“Knowledge syntheses provide the evidence base for other implementation vehicles such as patient decision aids, clinical practice guidelines, or policy briefs.” (Eccles et al., 2009: 4).

During the first part of the Realist Review, the C-M-O model was built and questions formulated accordingly (chapter 5.1.3). Then the literature was searched (chapter 5.1.4 to 5.1.9). For the second part that is outlined here, data were extracted and then results synthesized. Extracting the data consists of three steps annotation, collation and reporting (Pawson, 2006). The final step, the realist synthesis, represents the quintessence of the data extraction. The individual steps are now outlined in detail.

As recommended by Pawson (2006), for the process of annotation studies were screened for information that related to the questions from the C-M-O model (chapter 5.1.3) and relevant paragraphs of the text were therefore highlighted with a text marker.

Subsequently, data were collated. For this purpose, a template consisting of a domain for the social context, the social determinant and breastfeeding period respectively had been created and was filled with respective pieces of information from the studies. Tables containing all collated data are added to the annex (C2).

Then, a summary of all confirmed social determinants and their impact on one or more breastfeeding periods (table 11) was prepared to provide an overall picture, completed by the elaboration of the anticipated social determinants that had been confirmed by the Realist Review, displayed according to country (tables 12, 14 and 16).

Then the reportage was conducted combining the different pieces of information from the various sources are combined to complete the picture in order to answer the initial set of questions derived from the C-M-O model in chapter 5.1.3 (Pawson, 2006). Data are therefore

presented as quotations from the studies. The aim of reporting is to distil information in order to demonstrate the data basis on which answers are built on. The blueprint and therefore leading question was: Which social determinant  $x$  influences the breastfeeding period  $y$  in what type of social context? This blueprint question was then translated into questions derived from the C-M-O model (chapter 5.1.3), e.g. question 1: How does maternal age influence the breastfeeding period in the given social context in Germany/the United Kingdom/Ghana? In order to maintain the readability of the results chapter, only those question that were answered comprehensively giving information on the social determinant, the social context and one or more breastfeeding periods are presented in the results chapter 6.3. All other questions and their incomplete answers are added to the annex (C4).

The final stage of the analysis was then the realist synthesis. As stated above, it represents the quintessence of the reporting. Steps recommended by Pawson et al. (2004) and Pawson (2006) were followed. Two main objectives were pursued, which were to unravel information about the underlying mechanism of an effect and the role of its context.

“In the realist approach the studies are interrogated for what they say about the inner mechanisms [...]”(Pawson et al. 2004: 29)

There is no single technique to uncover relevant information. The reviewer seeks to construct an explanation for the question at stake. In order to actually synthesize one has to “[...] compare and contrast findings from different studies [...] to address the purpose(s) of the review.” (Pawson, 2006:126). As a consequence, the amount of information retrieved, analyzed and presented is not uniform, but rather varies substantially. Besides, a Realist Synthesis ought to emphasize on taking the same program theory in different settings into account. For the purpose of this dissertation the “synthesis to consider the same theory in comparative settings” was therefore chosen (Pawson et al., 2004: 34; Pawson, 2006: 95). The approach was opted for because it is especially suitable for settings that remain outside the health care system (Pawson et al., 2004) and therefore seemed appropriate for the anticipated social contexts in which a two-year breastfeeding period would take place, e.g. public and workplace. The quintessence of synthesized results are then visualized in the tables 13 (Germany), 15 (United Kingdom) and 17 (Ghana), indicating the social context, the social determinants with the specific mechanism taking effect on the respective breastfeeding period.

#### **5.1.18 Limitations of the Realist Review Methodology**

There are several limitations in relation to the Realist Review for the research at stake. The first was that only those databases were searched that were recommended by the different experts. The Realist Synthesis does not aim at delivering standardized results that are reproducible, but rather at disclosing new insights. The principle of Realist Synthesis is that “[...] warrantable inferences from the data presented...” are drawn (Pawson 2006: 130). As in any

qualitative evaluation, its strength lies in the fact that information is generated to enhance the understanding of underlying mechanisms. The other side of the coin is that this procedure is not guided by a systematic evaluation, and that ultimately it is the author's impression that shapes how results are synthesized and presented (Pawson, 2006). Reliability of this methodological approach is therefore limited. Another issue arises with type of study designs suitable for analysis. Pawson recommends primary studies, but this was altered to original research in order to include secondary analyses. Besides, for quantitative research designs he recommends pathway studies because they allow an insight into the mechanisms at stake researching latent variables, e.g. factorial analysis (ibid).

## **5.2 Analyses of Guidelines**

The second part of the dissertation was to analyze policies and/or guidelines pertinent to breastfeeding from Germany, the United Kingdom and Ghana. Analysis was undertaken in three steps: first, a quality assessment with the AGREE II tool was conducted, second guidelines searched for whether they addressed the breastfeeding continuum by operationalizing the three breastfeeding periods, and finally scrutinizing them with the BIAS FREE Framework.

Two guidelines for each country were selected according to the following criteria: the first guideline had to relate to healthy newborns and breastfeeding – at best a clinical practice guideline and the second one should refer to a health risk that can be either prevented or positively influenced through breastfeeding. The rationale for most prevalent child diseases is outlined under the corresponding country profile in the background chapter. If available, the updated version of the respective guideline was used. The original versions of the guidelines can be found in the annex (D3).

### **5.2.1 Description of Guidelines from Germany**

In Germany, the "Arbeitsgemeinschaft der Wissenschaftlichen Medizinischen Fachgesellschaften" (AWMF), an Association of the Scientific Medical Societies in Germany is in charge of developing guidelines with a focus on clinical practice guidelines (AWMF, 2004; Kopp, 2011). The guideline development group therefore is comprised of their members and representatives of guideline users. Main criteria for a guideline assessment are as follows: Recommendations are either based on a systematically achieved consensus and/or evidence is generated through a systematic search and assessment of studies. This procedure has to be described in detail (AWMF, 2004; Kopp, 2011). Guidelines are ranked according to three options: S1 guideline is based on expert opinions without having achieved consensus systematically and without a systematically developed evidence base; S2k stands for a guideline based on the systematic elaboration of a consensus by experts, or S2e - systematic genera-

tion of the evidence base; and rank S3 fulfills the criteria when both options of S2 are combined (Kopp, 2011).

A brief description is provided of the guidelines selected for Germany, namely a clinical practice guideline for the treatment of the healthy term newborn at the birth clinic and a guideline addressing allergy prevention in children.

The Guideline for the Healthy Term Newborn in the Birth Clinic; Registry no. 024 - 005 (Betreuung des gesunden, reifen Neugeborenen in der Geburtsklinik) was elaborated by different scientific medical societies, the German Society for Gynecology and Obstetrics, German Society for Child and Adolescent Medicine, German Society for Perinatal Medicine, the Union of German Midwives and finally the Society for Neonatal and Pediatric Intensive Care (AWMF, 2014). The guideline is ranked S2k. The most recent version was updated in 2014 and consists of 14 pages. The topic breastfeeding is covered for the two-hour period after birth in the labor ward, as well as during the stay on the maternity ward. It deals with the topic care of a newborn in the obstetric section and draws on breastfeeding where applicable.

The second Guideline for prevention of allergies; registry no. 061-016 (Leitlinie Allergieprävention) is a S3 guideline addressing the prevention of allergies in children and adolescents, that was developed by the German Society for Allergology and Clinical Immunology and the German Society for Child and Adolescent Medicine. It gives recommendations for preventing the onset of allergies in infants and children through adequate nutrition (AWMF, 2014). The focus is on the point in time when to introduce complementary foods while breastfeeding and/or formula feeding. The guideline was updated in July 2014.

### **5.2.2 Description of Guidelines from the United Kingdom**

The United Kingdom National Institute for Health and Clinical Excellence (NICE) is in charge for developing evidence-based guidelines that are then implemented by the National Health System in the United Kingdom (NICE, 2013). All guidelines developed by NICE are evidence-based according to Cochrane standards and follow a systematic guideline development procedure accompanied by an expert consensus (NICE, 2015b).

The first guideline chosen for the United Kingdom is similar to the one selected for Germany and also addresses the topic of postnatal care of women and their babies. The second guideline is directed towards malnutrition in women and their offspring in low-income households.

The Clinical Guideline CG37 Routine and Postnatal Care of Women and their Babies was developed under the auspice of the National Collaborating Center for Primary Care and by the University of Leicester that developed a full guide that was adopted by NICE (Demott et al., 2006). The guideline was updated in February 2015 (NICE, 2015a). The document con-

sists of 46 pages, with seven pages dealing with infant nutrition through breastfeeding/breast milk.

In addition to CG37, NICE recommends the Public Health Guideline PH11 addressing maternal and child nutrition of women and children in low-income households. Breastfeeding is covered on two pages. The updated version is available since November 2014 (NICE, 2014).

### **5.2.3 Description of Policy and Guideline from Ghana**

In Ghana, the Ministry of Health is in charge of developing standard treatment guidelines in conjunction with Ghana Health Service and medical experts (MoH Ghana, 2010). At present, there are several maternal and child health policies and strategies in place, such as the Infant and Young Child Feeding Strategy for Ghana (GHS, 2007) and the National Breastfeeding Policy (MoH Ghana, 1995) that is not translated into a guideline. After consulting Dr. Edusei, an expert in nutrition and community health at Kwame Nkrumah University of Science and Technology at Kumasi, Ghana, in 2013, the decision was taken to follow his advice and choose the Under Five's Child Health Policy (Edusei, 2013). Besides, health policies are the blueprints for guidelines, whereby strategies mainly serve as umbrella documents. The second guideline deals with the Prevention of Mother to Child Transmission of HIV.

The Under Five's Child Health Policy: 2007-2015 was elaborated under the auspice of the Ministry of Health by the Ghana Medical Association. It consists of a 25-page document, where breastfeeding is covered on two pages (MoH Ghana, 2009).

The National Guideline on Prevention from Mother To Child Transmission of HIV (PMTCT) issued by the Ministry of Health in 2008 was selected (MoH Ghana, 2008). There is no update available. They were adopted from WHO guidelines on HIV and elaborated by the National AIDS/STI Control Program and the Reproductive and Child Health Unit of the Ghana Health Service (MoH Ghana, 2008). The document consists of 27 pages, whereby breastfeeding has been addressed specifically under the topic of infant feeding options in two pages.

### **5.2.4 Quality Assessment of Guidelines with AGREE II**

Guidelines should be systematically elaborated according to standardized quality criteria. However, in reality the variability in guidelines is often substantial. Therefore, the AGREE Next Steps Consortium developed a tool with which guideline quality can be appraised (AGREE, 2013). AGREE II is an internationally accepted tool for developing guidelines and assessing the quality of already existing ones.

The AGREE tool was developed in 2003 by a collaboration of international guideline developers and researchers as an aid to appraise the quality of existing guidelines (AGREE,

2013). AGREE stands for Appraisal of Guidelines for Research and Evaluation. After the tool had been introduced and applied, it became necessary to revise it and develop it further. Some members of the original group therefore founded the AGREE Next Steps Consortium in order to increase the number of appraising items applied by users, including reliability and validity, as well as enhance applicability and generate training materials. As a result, AGREE II was launched in 2009 and later employed by the Cochrane Collaboration (AGREE, 2013). The tool focuses on evaluating the methodological strength of a guideline as well as transparency regarding the development procedure (ibid). The updated version AGREE II (2013) can be used by health care providers when adopting a guideline into practice, by guideline developers as a support for their methodological conduct, by policy makers to facilitate decision-making, and finally by educators who train on critical appraisal skills and guideline development. It can be applied to guidelines of any disease area in any stage of the care continuum, as for health promotion, public health, screening, diagnosis, treatment or intervention (AGREE, 2013). It consists of a User's Manual and six domains that comprise 23 items as well as two overall assessments (ibid). The first one relates to the overall quality of the guideline, and the second one whether the guidelines should be recommended for use, for use with modifications or not recommended for use (yes/yes, with modification/no).

**Domain 1.** 'Scope and Purpose' is concerned with the overall aim of the guideline, the specific health questions, and the target population. It deals with the concern raised in this chapter whether the overall objective(s) of the guideline is (are) specifically described, the health question(s) covered by the guideline is (are) specifically described and the population (patients, public, etc.) to whom the guideline is meant to apply to is specifically described.

**Domain 2.** 'Stakeholder Involvement' focuses on the extent to which the guideline was developed by the appropriate stakeholders and represents the views of its potential users. It therefore addresses the requirement of tailoring a guideline according to patients' needs and preferences.

**Domain 3.** 'Rigor of Development' relates to the process used to gather and synthesize the evidence, the methods to formulate the recommendations, and to update them. Domain 3 values the fact that guidelines have to be derived from scientific evidence.

**Domain 4.** 'Clarity of Presentation' stands for appraising the language, structure, and format of the guideline. Recommendations should be stated in a specific and unambiguous manner, different options for management of the condition or health issue have to be clearly presented, and key recommendations need to be easily identifiable.

**Domain 5.** 'Applicability' pertains to possible barriers and facilitators to implementation, strategies to improve uptake, and resource implications of applying the guideline. Domain 5 addresses the requirement for a guideline to describe facilitators and barriers to its applica-

tion; provides advice and/or tools on how the recommendations can be put into practice, the potential resource implications of applying the recommendations, and whether the guideline presents monitoring and/or auditing criteria.

**Domain 6.** 'Editorial Independence' is concerned with the formulation of recommendations influenced by competing interests. Therefore, domain 6 asks for the independence of authors and possible conflicting interests of members of the guideline-developing group.

In the dissertation, the appraisal of guidelines and policy analysis was restricted to the information accessible in the guideline and adjuvant documents, but not verified externally. Three domains were of further interest, starting with no. 2 'Stakeholder Involvement'. This domain verifies whether relevant stakeholders were involved during guideline development and their views are represented. This aspect is important in regards to the main topic of the thesis, because it could be a way to integrate the perspectives of those populations who tend to breastfeed to a lesser extent. The next domain of interest was no. 3 'Rigor of Development' because it relates to the evidence-base of the guideline. According to Siering et al. (2015) for guidelines for asthma and breast cancer only in about half of the cases a level of evidence is assigned and the link to the evidence-base provided. The third area of interest was domain 6 'Editorial Independence'. As outlined in the background chapter, the formula producing industry has been influential over a time span of more than 100 years (Dykes, 2006; Rollins et al., 2016) and therefore there is need to verify whether they are involved in guideline elaboration.

The guidelines were appraised and then the corresponding quality scores calculated following the manual of AGREE II (AGREE, 2013). The minimum score of 1 is applicable if no criterion of an item belonging to a certain domain is fulfilled or only to a very small extent, whereas the maximum score of 7 should be awarded if all criteria are met. For the scores 2 to 6, they are completed according to the degree to which they fulfill the requirements of each item/domain. However, there are no defined measures provided. Scores are then entered into a formula displayed below, and the result reflects the proportion expressed in % of the highest achievable score. Quality scores reflect the comparability of guidelines and whether they should be recommended for use or not, but no ranking system has been established by the AGREE Consortium to finally decide whether a guidelines should be rated as of poor or high quality (AGREE, 2013).

The formula for calculating scores is as follows:

$$\frac{\text{Obtained Score}-\text{Minimum Possible Score}}{\text{Maximum Score}-\text{Minimum Possible Score}} \times 100$$

Minimum possible score = 1 (strongly disagree) x X (items) x 2 (appraisers)

Maximum possible score = 7 (strongly agree) x X (items) x 2 (appraisers)

The AGREE consortium (2013) strongly recommends that a guideline assessment is carried out by at least two and four appraisers at best. For reasons of quality assurance and due to limited resources, a second appraiser for each country supported the guideline assessment in this dissertation. For Germany, GK, a professor and physician specialized in intensive and anesthetic care, with extensive experience in health care research and an expert in global health; for the United Kingdom AT, a registered nurse, with a Master of Science degree in Public Health, who worked on adapting clinical practice guidelines for children with cerebral palsy in the resource-limited setting of Gaza, Palestine for his Master Thesis supervised by the author of the dissertation, and is currently studying the Master Program of “Physical Activity and Health” at the Friedrich-Alexander Universität Erlangen. LDK, Dr. med and Master Public Health, was the appraiser for Ghana. She is a psychiatrist and mental public health expert. The author of the dissertation, RW, Master of Science in Public Health, is a registered nurse specialized as a breastfeeding and lactation consultant, developed a hospital-based breastfeeding guideline when working in maternity care, and is a global reproductive health professional to-date. More details are added to the annex (D1).

### **5.2.5 Limitations for the Assessment of Guideline Quality**

There are a few limitations that are associated with the AGREE II tool. The main weakness stems from the fact that although the tool was tested for validity and reliability and can be used for many health topics in different regions of the world and guideline development procedures, there is no score level defined to distinguish precisely between a “high” quality and a “low” quality guideline (Polus et al., 2012). Therefore, the scores calculated for the guideline appraisals should be handled with care. Moreover, the number of appraisers, the semi-quantitative manner of appraising and the number of guidelines that were appraised imply that score assessment may be due to chance (ibid). These limitations can be conferred to this dissertation since there were only two guideline appraisers per guideline assessment.

### **5.3 Verification of Breastfeeding Periods in Guidelines**

The next step of the analysis was to verify whether the breastfeeding continuum was reflected in the guidelines under research. For this purpose, the breastfeeding continuum was operationalized into the three relevant stages, early onset, an exclusive breastfeeding period for six months and an entire length of breastfeeding for two years. Guidelines were carefully scrutinized and respective paragraphs referring to one or more of the stages were documented accordingly. However, the question and possible limitation has to be raised whether this approach is sufficient or there are more components that should be addressed to verify a continuum.

## 5.4 Guideline Analysis with the BIAS FREE Framework

The last step of the analysis was to scrutinize the guidelines with the BIAS FREE Framework.

As outlined in the background chapter, the tool is specifically designed to identify social biases in the different phases of the health research process that are »request for proposal, research proposal, literature review, ethical review, research question/question, research design, description of population to be studied, staffing, concepts, theoretical framework/model, research methods/instruments, recruitment of participants, data analysis and interpretation, conclusion, policy recommendations, identification of the audience, abstract/executive summary, language, visual representation, and communication of results« (ibid). The authors emphasize that the framework is applicable to research, legislation, policies, programs and practices (Burke & Eichler, 2006). Moreover, it has been tested for its applicability by research groups in three African countries (Eichler & Burke, 2006) and can therefore be considered as appropriate for analyzing guidelines/policy documents from Ghana.

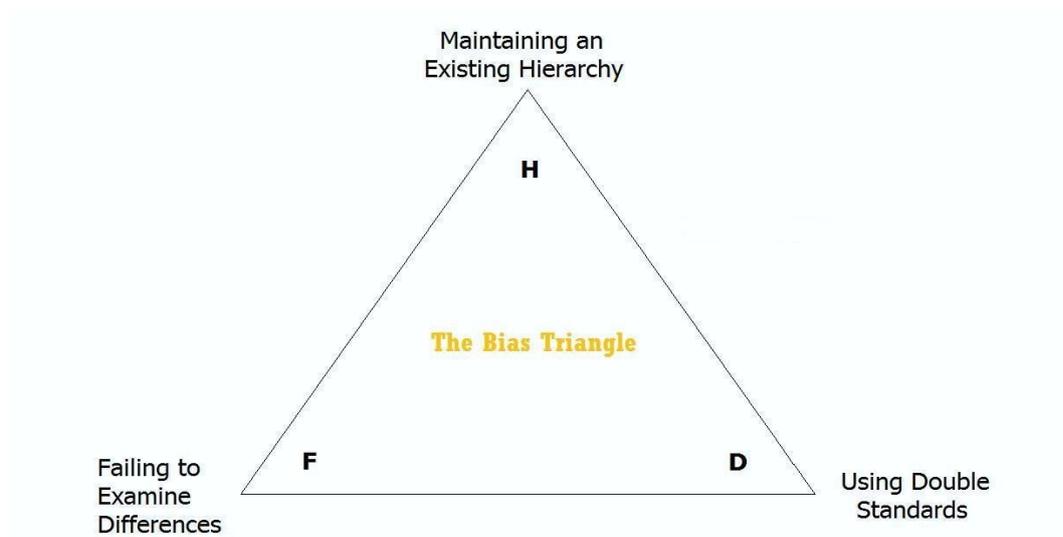
### 5.4.1 Description of the BIAS FREE Framework Tool

The BIAS FREE Framework provides a list of social categories that consist of social hierarchies causing social bias: gender, disability, race/ethnicity, age, class, caste, socio-economic status, religion, sexual orientation, geographical location, and health status (Burke & Eichler, 2006). According to the authors, this list is not exhaustive and should be adapted to the corresponding setting (Eichler & Burke, 2006).

The instrument operates by applying analytical questions centered around three problem types that form the basis of a social bias. In order to identify the nature of the problem, diagnostic questions have to be applied according to each problem type: Maintaining an existing hierarchy (H Problems) providing seven diagnostic questions, four for Failing to examine differences (F Problems) and eight for Using double standards (D Problems) (Eichler & Burke, 2006). Any steps that lead to the perpetuation of a hierarchy fall under the H-Problem. Failing to examine differences and Using double standards look at the same problem, but from opposite angles: in the first case it would be necessary to recognize differences (F Problem), whereas in the second case different standards are applied when not appropriate (D Problem). This can be distinguished by verifying whether different or the same treatment/recommendation increases or decreases the effect of the social determinant.

The following graph illustrates the bias triangle:

**Figure 12: The BIAS Triangle**



**Source: Burke & Eichler 2006**

The diagnostic questions according to problem type are as follows:

H: Maintaining an existing hierarchy

Is dominance of one group over the other in any way justified or maintained?

Situate the problem within a human rights framework, in that equality is an underlying value. Point out the discrepancy between this value and the inequalities among groups of people that result from the hierarchy.

Subtypes H1 – H7

H1: Denying hierarchy - Is the existence of a hierarchy denied in spite of widespread evidence of the contrary?

H2: Maintaining hierarchy – Are practices or views that are based on a hierarchy presented as normal or unproblematic?

H3: Dominant perspective – Is the perspective or standpoint of the dominant group adopted?

H4: Pathologization – Is the non-dominant group pathologized when it differs from the norms derived from the dominant group?

H5: Objectification – Is stripping people from their intrinsic dignity and personhood presented as normal or unproblematic?

H6: Victim-blaming – Are victims of individual and/or structural violence blamed and held accountable?

H7: Appropriation – Is ownership claimed by the dominant group for entities that originate(d) or belong to the non-dominant group?

#### F: Failing to examine differences

Is membership in a non-dominant group examined as socially relevant and accommodated? Establish the relevance of group membership within a given context. Once relevance is established, accommodate differences in ways that reduce the hierarchy.

#### Subtypes F1 – F4

F1: Insensitivity to difference – Has the relevance of membership in a dominant/non-dominant group been ignored?

F2: Decontextualization – Has the different social reality of dominant and non-dominant groups explicitly been considered?

F3: Over-generalization or universalization – Is information derived from dominant groups generalized to non-dominant groups without examining if it is applicable to the non-dominant group?

F4: Assumed homogeneity – Is the dominant or non-dominant group treated as a uniform group?

#### D: Using double standards

Are non-dominant/dominant groups dealt with differently?

Identify the double standards that lead to different treatment of members of dominant and non-dominant groups and how this maintains a hierarchy; then, devise means to provide the same treatment to both groups.

#### Subtypes D1 – D8

D1: Overt double standard – Are non-dominant and dominant groups treated differently?

D2: Underrepresentation or exclusion – Are non-dominant groups underrepresented or excluded?

D3: Exceptional under representation or exclusion – In contexts normally associated with non-dominant groups, but pertinent to all groups, is the dominant group underrepresented or excluded?

D4: Denying agency – Is there failure to consider non-dominant/dominant groups as both actors and acted upon?

D5: Treating dominant opinions as facts – Are opinions expressed by a dominant group about a non-dominant group treated as facts?

D6: Stereotyping – Are stereotypes of non-dominant/dominant groups treated as essential aspects of group membership?

D7: Exaggerating difference – Are overlapping traits treated as if they were characteristic of only non-dominant/dominant groups?

D8: Hidden double standards – Are different criteria used to define comparable facts with the effect of hiding their comparability?

#### **5.4.2 Social Bias Analyses of Guidelines**

The next step was to conduct the social bias analysis. Adhering to the recommendations from Burke & Eichler (2006), the social hierarchies stated here were replaced by the respective social determinants pertinent to breastfeeding. Then, the guidelines had been screened for sections relating to breastfeeding. The subtype problem related to the respective social determinant was stated with a justification based on the results from the Realist Synthesis. For a better visual representation, the respective section of the text was cited, but not the entire wording. The detailed information of the complete text can be found in the tables added to the annex (D2).

Basically, the methodological approach from Babitsch (2005) in regards to her work with the gender-based analysis tool developed by Eichler (1991) was adopted. The first decision therefore to take was which of the three main problem types would apply. Hence, the main distinction was whether the social determinant was mentioned or not. In case yes, it fell under H – Maintaining an existing hierarchy and D – Using double standards. In case no, F – Failing to examine differences was chosen. The distinction between H and F was then made according to the nature of the problem, whether the social hierarchy was perpetuated (H), or a different standard applied according to differing ends of the hierarchy. In one case, H7 and D4, the problem subtypes are not applicable to this research, since the rationale is based on colonialism and racial studies according to Burke & Eichler (2006).

Social hierarchies have different manifestations. At the individual level, they can exist in-between a social category, e.g. SES – low, middle and high. Depending on which end of the social hierarchy a mother is located, it can affect her behavior. An example is that mothers with a low SES representing the low end of the social hierarchy of SES display significantly lower breastfeeding rates in Germany, which is exacerbating health inequities for their offspring in comparison to children born to mothers with a middle or high SES. This is the logic behind a social determinant influencing a certain health behavior and therefore health outcome. The other manifestation is that the social hierarchy expands among social categories also known as intersecting, e.g. maternal age – young, old – and SES, e.g. young mothers with a low SES, who have lower breastfeeding rates than young mothers or mothers with a low SES only (examples are borrowed from Weißborn, 2009).

Regarding the meso level, influence of these social determinants is of an indirect nature, as in the case of social networks, which can vary substantially and therefore their impact on the social reality of a woman. A supportive social network is an important factor for breastfeeding success in the mother, and vice versa. This is also true for workplace regulation.

Social determinants located at the macro level can have a generally enabling or impeding effect, as in the case of culture as a social norm to breastfeed, or policies that address parental leave and breastfeeding at the workplace. Therefore, social hierarchies have to be acknowledged when recommendations at the structural levels are formulated, since they will impact on health behavior and health outcome.

Secondly, adhering to the recommendations from Burke & Eichler (2006), the list of social categories was adapted to the corresponding setting by replacing them with the findings from the Realist Reviews with consent of the first supervisor (UMS). The results from the Realist Synthesis served as the basis to justify their integration. The tool also provides space for elaborating solutions by reformulating, but for the dissertation, the emphasis was laid on the analyses only.

In order to objectively decide for a problem type/subtype, the table below demonstrates the criteria in which case they should be applied. The different problem types were distinguished as follows:

**Table 5: Problem Type with Criteria for Application**

<b>Problem type</b>	<b>Criteria for application</b>
<b>H – Maintaining an existing hierarchy: Is dominance of one group over the other in any way justified or maintained?</b>	
H1: Denying hierarchy - Is the existence of a hierarchy denied in widespread evidence of the contrary?	Active denial that there are differences in-between or among social determinants, e.g. in the case of maternal educational level known to impact on health outcomes
H2: Maintaining hierarchy – Are practices or views that are based on a hierarchy presented as normal or unproblematic?	Emphasis on practices that do not include or address social determinants, e.g. emphasis on solely medical knowledge without acknowledging social factors
H3: Dominant perspective – Is the perspective or standpoint of the dominant group adopted?	Citation of recommendations from facts based only on one end of the hierarchy among a social determinant, e.g. applicable only for mothers with a middle or high SES
H4: Pathologization – Is the non-dominant group pathologized when it differs from the norms derived from the dominant group?	Mothers from an end of a hierarchy that affects her breastfeeding behavior negatively is presented as abnormal

<b>Problem type</b>	<b>Criteria for application</b>
H5: Objectification – Is stripping people from their intrinsic dignity and personhood presented as normal or unproblematic?	Active blaming of women belonging to a marginalizing social determinant/the end of a hierarchy from a social determinant
H6: Victim-blaming – Are victims of individual and/or structural violence blamed and held accountable?	Women that are exposed to social determinants located at the macro level, e.g. parental leave that influences the breastfeeding period negatively are ignored and women blamed instead.
H7: Appropriation – Is ownership claimed by the dominant group for entities that originate(d) or belong to the non-dominant group?	Not applicable
<b>F – Failing to examine differences: Is membership in a non-dominant group examined as socially relevant and accommodated?</b>	
F1 Insensitivity to differences – Has the relevance of membership in a dominant/non-dominant group been ignored?	Social determinant not a characteristic for all mothers, e.g. one-parent family
F2 Decontextualization – Has the different social reality of dominant and non-dominant groups explicitly been considered?	Social determinants relevant for the social reality of the mothers and do not represent a fixed characteristic as such, e.g. social networks
F3 Over-generalization or universalization – Is information derived from dominant groups generalized to non-dominant groups without examining if it is applicable to the non-dominant group?	Mothers are mentioned per se without taking into consideration their individual differences
F4: Assumed homogeneity – Is the dominant or non-dominant group treated as a uniform group?	More than one social determinant relevant in an intersecting way, e.g. maternal age and maternal educational level
<b>D – Using double standards: Are non-dominant/dominant groups dealt with differently?</b>	
D1: Overt double standard – Are non-dominant and dominant groups treated differently?	Different recommendation(s) are made for in-between a social determinant or among social determinants.
D2: Underrepresentation or exclusion – Are non-dominant groups underrepresented or excluded?	Social determinant known to be influential in regards to the recommendation is not mentioned.

<b>Problem type</b>	<b>Criteria for application</b>
D3: Exceptional under representation or exclusion – In contexts normally associated with non-dominant groups, but pertinent to all groups, is the dominant group underrepresented or excluded?	End of hierarchy of a social determinant having a positive effect is not mentioned in social contexts relevant for the other end of the hierarchies.
D4: Denying agency – Is there failure to consider non-dominant/dominant groups as both actors and acted upon?	Not applicable, relates to oppression as a social determinant.
D5: Treating dominant opinions as facts – Are opinions expressed by a dominant group about a non-dominant group treated as facts?	Recommendations regarding a social determinant are derived from opinions, but not evidence-based.
D6: Stereotyping – Are stereotypes of non-dominant/dominant groups treated as essential aspects of group membership?	Behavior typically related to a social determinant or a certain end of hierarchy is portrayed as “normal”.
D7: Exaggerating difference – Are overlapping traits treated as if they were characteristic of only non-dominant/dominant groups?	Intersecting social determinants are subsumed under one social determinant.
D8: Hidden double standards – Are different criteria used to define comparable facts with the effect of hiding their comparability?	Evidence in recommendations is used to homogenize effects of differing social determinants.

*Source: Burke & Eichler, 2006; adapted by Waldherr, 2015*

### **5.4.3 Limitations of the BIAS FREE Methodology**

Regarding guideline analyses with the BIAS FREE Framework, the main limitation derived from the lack of the exact operationalization of the sub-problems in order to facilitate application. Unfortunately, the founders of the BIAS FREE Framework did not provide a detailed rationale how to distinguish overlapping areas from sub-problem types.

## 6 Results

In this chapter, results are elaborated. It starts with a summary of the Realist Review of the three countries. An overall assessment according to the SIGN methodological checklist (2014) is then provided per country as well as tables describing the assessment of breastfeeding periods followed by the interrater reliability conducted for the screening process. Then, results from the data extraction and Realist Synthesis are described. As a second part, results from the guideline analyses are stated, starting with a quality appraisal. A verification of breastfeeding periods mentioned in the guidelines subject to analysis are stated and compared with current WHO recommendations to confirm in how far the breastfeeding continuum has been acknowledged. Lastly, results from the analysis with the BIAS FREE instrument are presented.

### 6.1 Studies Identified from the Realist Review

For Germany, eight studies delivered information on nine social determinants from the 16 originally researched. The confirmed ones were maternal age, maternal educational level, SES, one-parent family, gender of infant, geographical location located at the micro level, social networks at the meso and culture at the macro level.

Regarding the United Kingdom, 11 studies revealed an insight on 10 out of 16 social determinants. At the individual level, maternal age, maternal educational level, SES, one-parent family, and ethnicity were identified, social networks at the organizational and culture, religion, workplace regulation and parental leave at the normative/policy level.

For Ghana, from six studies, 10 from 18 social determinants were confirmed, including maternal age, maternal educational level, wealth index, gender of infant at the micro level, social networks and working conditions at the meso and culture, religion, workplace regulation at the macro level.

**Table 6: Summary of Results of the Realist Reviews according to C-M-O model**

Number		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Social determinants	Inclusion	Mat. age	Mat. educ level	SES/wealth index	One-parent family	Employment status	Migration ethnicity tribe	Gender of infant	Disability of mother	Disability child	Geographical location	Food insecurity	Social network	Working conditions	Poly-gyny	Culture	Religion	Workplace regulation	Parental leave
Level	Micro											Meso				Macro			
Germany no. of studies	8																		
Determinant	9	X	X	X	X	—	—	X	—	—	X	—	X	—	—	X	—	—	—
United Kingdom no. of studies	11																		
Determinant	10	X	X	X	X	—	X	—	—	—	—	—	X	—	—	X	X	X	X
Ghana no. of studies	6	6																	
Determinant	10	X	X	X	—	—	—	X	—	—	—	—	X	X	—	X	X	X	—

Detailed descriptions of the studies analyzed can be found in the annex (C3). Table 7, 8 and 9 entail indicators for the assessment of breastfeeding periods per country.

The eight studies retrieved for Germany employed predominantly a quantitative research design (Dulon et al., 2001; Bergmann et al., 2002; Dulon et al., 2003; Weißenborn, 2007; Soto-Ramirez & Karmaus, 2008; Pflüger et al., 2010; Libuda et al., 2014) and only one qualitative study (Wehrstedt, 2013). As outlined in chapter 5.1.11, their quality was assessed according to criteria from SIGN methodological checklist (2014). From the eight studies that were analyzed, one was ranked as high quality (Libuda et al., 2014), four as acceptable (Dulon et al., 2001; Dulon et al., 2003; Weißenborn, 2009; Wehrstedt, 2014) and three were ranked as low quality (Bergmann et al., 2002; Soto-Ramirez & Karmaus, 2008; Pflüger et al., 2010). No study had to be rejected.

**Table 7: Assessment of Breastfeeding Periods: Germany**

<b>Author, year of publication</b>	<b>Assessment of breastfeeding periods</b>
Bergmann et al., 2002	Assessment method: mothers documented feeding habits continuously and reported them during follow-up visits Outcome measure: any breastfeeding duration in months incl. exclusive breastfeeding; not further specified
Dulon, M. et al., 2001	Assessment method: infant feeding practice for the previous week Outcome measure: full breastfeeding (= exclusive and predominant according to WHO definition), short term breastfeeding (< 4 months), long term breastfeeding (> 4 months)
Dulon, M. et al., 2003	Assessment method: infant feeding practices for the previous week Outcome measure: full breastfeeding (= exclusive and predominant according to WHO definition), short term breastfeeding (< 4 months), long term breastfeeding (> 4 months)
Libuda, L. et al., 2014	Assessment method: retrospective assessment of breastfeeding behavior Outcome measure: breastfeeding initiation, exclusive breastfeeding for at least the first 4 months (only breast milk without other liquids, including water or solids)
Pflüger, M. et al., 2010	Assessment method: daily food records Outcome measure: breastfeeding (yes or no), duration of full breastfeeding (weeks) according to WHO definition
Soto-Ramírez, N.; Karmaus, W., 2008	Assessment method: duration of exclusive breastfeeding (no other source of food) Outcome measure: total duration of breastfeeding
Wehrstedt, C., 2014	Assessment method: retrospective assessment Outcome measure: breastfeeding > 1 year yes/no
Weißenborn, A., 2009	Assessment method: 24-hour recall Outcome measure: breastfeeding 1h postpartum, exclusive breastfeeding, predominant breastfeeding, full breastfeeding according to WHO definition

The 11 studies identified for the United Kingdom employed mixed research designs, with five qualitative (Earle, 2002; Dykes et al., 2003; Gatrell, 2007; Brown & Lee, 2011; Williamson & Sacranie, 2012) and six quantitative studies (Cooper et al., 1993; Sittlington, et al., 2007; Bishop et al., 2008; Brown et al., 2010; Lawton et al., 2012; Oakley et al., 2014). The quality from one study was rated as 'high' (Oakley et al., 2014), seven studies were ranked as 'acceptable' (Cooper et al., 1993; Brown & Lee, 2011; Earle, 2002; Dykes et al., 2003; Sittlington et al., 2007; Lawton et al., 2012; Williamson & Sacranie, 2012), and three as 'low' (Gatrell, 2007; Bishop et al., 2008; Brown et al., 2010).

**Table 8: Assessment of Breastfeeding Periods: United Kingdom**

<b>Author, year of publication</b>	<b>Assessment of breastfeeding periods</b>
Bishop et al., 2008	Assessment method: questionnaire, retrospective assessment (infants aged up to 5 months) Outcome measure: breastfeeding, defined as infants ever put to breast, versus bottle feeding, defined as infants never breastfed
Brown et al., 2010	Assessment method: questionnaire, retrospective assessment at 6-24 months postpartum Outcome measure: initiation of breastfeeding, duration of breastfeeding
Brown & Lee, 2011	Assessment method: semi-structured interviews 6-12 months postpartum, retrospective assessment Outcome measure: exclusive breastfeeding for 6 months except feeding of vitamin drops and medications (WHO definition)
Cooper et al., 1993	Assessment method: semi-structured interviews, 2-3 months' postnatal assessment Outcome measure: breastfeeding initiation, duration of breastfeeding
Dykes et al., 2003	Assessment method: interviews, 6-10 weeks postpartum Outcome measure: breastfeeding (not specified)
Earle, 2002	Assessment method: in-depth, unstructured interviews, 6-14 weeks postpartum Outcome measure: breastfeeding initiation
Gatrell, 2007	Assessment method: in-depth interviews, retrospective assessment (up to 5 years postpartum) Outcome measure: breastfeeding initiation and duration
Lawton et al., 2012	Assessment method: interview at 6 months postpartum Outcome measure: ever breastfed yes/no, still breastfeeding yes/no
Oakley et al., 2014	Assessment method: questionnaire at 3 months postpartum asking for breastfeeding status on day 10 and at week 6 Outcome measure: breastfeeding initiation, defined as infant receiving breastmilk solely or along with formula during the first few days postpartum breastfeeding cessation: point in time where infant did not receive breastmilk anymore

Author, year of publication	Assessment of breastfeeding periods
Sittlington et al., 2007	Assessment method: data for initial infant-feeding method at birth from Northern Ireland Maternity System (NIMATS) Outcome measure: artificial versus breastfeeding outcome at discharge from hospital
Williamson & Sacranie, 2012	Assessment method: 2 semi-structured interviews - 1 <sup>st</sup> interview maximum 12 months postpartum; 2 <sup>nd</sup> interview upon completion of breastfeeding period Outcome measure: 1 <sup>st</sup> interview - current, ongoing breastfeeding experience $\geq$ 3 months; 2 <sup>nd</sup> interview – no breast milk was fed by any method anymore

For Ghana, only six studies could be retrieved, with three having a quantitative (Aidam et al., 2005; Gladzah, 2013; Danso, 2014) and three a qualitative study design (Tawiah-Agyemang et al., 2008; Otoo et al. 2009; Aborigo et al., 2012). One study quality was rated as 'high' (Tawiah-Agyemang et al., 2008), one as 'acceptable' (Aidam et al., 2005) and four as 'low' (Otoo et al., 2009; Aborigo et al., 2012; Gladzah, 2013; Danso, 2014).

**Table 9: Assessment of Breastfeeding Periods: Ghana**

Author, year of publication	Assessment of breastfeeding periods
Aborigo, et al., 2012	Assessment method: interview of mothers 4 weeks postpartum Outcome measure: initiation of breastfeeding
Aidam, et al., 2005	Assessment method: retrospective assessment (exclusive breastfeeding from birth) and 24-hour recall Outcome measure: age for introduction of complementary liquids/food: (i) plain water, (ii) sugar solution, (iii) juices, (iv) herbal teas, (v) other teas, (vi) baby formula (vii), other liquids, (viii) solid/mushy foods
Danso, 2014	Assessment measure: retrospective assessment between 6 and 24 months postpartum Outcome measure: exclusive breastfeeding (not defined)
Gladzah, 2013	Assessment method: retrospective assessment up to 10 years after birth Outcome measure: period of exclusive breastfeeding defined as feeding breast milk exclusively, no other liquid or semi-solid or solid food before 6 months (WHO definition)
Otoo, et al., 2009	Assessment method: assessment of exclusive breastfeeding at age 4 months Outcome measure: introduction of solid foods
Tawiah-Agyemang et al., 2008	Assessment method: retrospective assessment up to 8 weeks postpartum Outcome measure: initiation of breastfeeding

## 6.2 Interrater Reliability

The screenings had been performed in three stages, but only for the first two a second reviewer co-assessed the studies. During the first step, only title and abstract had been assessed, and for the second, the full-text. As already outlined in chapter 5.1.1.1, a Cohens kappa coefficient was calculated per country in order to determine the concordance of both reviewers.

**Table 10: Interrater Reliability of Screening Process, All Countries**

Country	Cohen´s kappa co-efficient
Germany	k = 0.33
Ghana	k = 0.46
United Kingdom	k = 0.24

A kappa coefficient of 0.21 – 0.4 is interpreted as a modest concordance in rating, one with 0.41 – 0.6 considered as average, and a range of 0.61 to 0.8 as a good concordance of both reviewers (Grouven et al., 2007).

## 6.3 Results of Data Extraction and Realist Synthesis

In this chapter, the different steps that a Realist Synthesis requires are outlined. It is structured in a way that first a brief summary of general findings of the three countries are presented. Then individual steps of the analysis follow, starting with table 11, where the relationship between a respective social determinant and the impact on one or more breastfeeding periods is depicted. Subsequently, results for each country are presented. First, anticipated social determinants were compared with confirmed ones (table 12 for Germany, table 14 for the United Kingdom and table 16 for Ghana). Next, the reporting of data according to the questions that were generated from the C-M-O model (chapter 5.1.3) are presented, followed by the last step, the Realist Synthesis. This final part is restricted to those questions where comprehensive information was retrieved. All data reported can be viewed in the annex (C4).

### 6.3.1 Summarized Findings

In the three countries under research, four social determinants were confirmed for all of them: maternal age, maternal educational level, SES/wealth index, and social networks. The first three are individual social factors, and findings are consistent that young age, a low educational level, a low SES/wealth index are negatively associated with breastfeeding. For Ghana this is also true for a high wealth index. At the meso level, social networks represented by the women’s partner and maternal/paternal grandmother exercise a strong influence both positive and negative. In regards to contexts, four social contexts were identified as rel-

evant in total: birth place/health services with antenatal care (ANC), obstetric care (OC), postnatal care (PNC) followed by home, work and public. In order to maintain the readability of tables, the abbreviations ANC, OC and PNC introduced at this late stage will be further used. The social context home was significant for all three countries.

The following table displays the social determinants identified from the Realist Review with their relationship in regards to breastfeeding. They are listed for each country, and the plus signifies that the social determinant(s) has/have a negative impact on either breastfeeding uptake as such, early onset, exclusive breastfeeding and the breastfeeding period, as well as the minus that there was either no or a protective effect. It is presented according to the study.

**Table 11: Summary of Social Determinants Identified according to Study and Impact on the Breastfeeding Period**

<b>Level</b>	<b>Impact of social determinant on breastfeeding periods</b>
<b>Germany</b>	
<b>Micro level</b>	<b>Impact of social determinant on breastfeeding periods</b>
Maternal age	Age (not specified) → BF start + (Soto-Ramirez & Karmaus, 2008); young age → EBF + (Libuda et al., 2014);  age → BF period + (Bergmann et al., 2002); young age → BF period + (Dulon et al., 2001, Dulon et al., 2003, Pflüger et al., 2010; Weißenborn, 2009)
Maternal educational level	Low educational level → BF period + (Dulon et al., 2001; Dulon et al., 2003; Weißenborn, 2009)
Maternal age & educational level	Young age and low educational level → BF period +++ (Weißenborn, 2009)
Maternal age & SES	Young age → BF start was not relevant after inclusion of social status (Libuda et al, 2014)
One-parent family	One-parent status → BF period + (Dulon et al., 2001; Weißenborn, 2009)
Employment status	Returning to work → BF period + (Dulon et al., 2001)
Gender of infant	Male gender → BF period + (Weißenborn, 2009)
<b>Meso level</b>	<b>Impact of social determinant on breastfeeding periods</b>
Geographical location	Area of descent (West German) → BF start + (Dulon et al., 2001); area of residence (West German) → BF start + (Libuda et al, 2014);  area of descent (East German) → BF period + (Dulon et al., 2001)
Social networks	Partner's negative attitude → BF period + (Dulon et al., 2001); social environment → BF period + (Wehrstedt, 2014, Weißenborn, 2009)
<b>Macro level</b>	
Culture	Appropriate breastfeeding period <1 year + (Wehrstedt, 2014); medical culture → BF period + (Wehrstedt, 2014)

<b>Level</b>	<b>Impact of social determinant on breastfeeding periods</b>
<b>United Kingdom</b>	
<b>Micro level</b>	<b>Impact of social determinant on breastfeeding periods</b>
Maternal age	Young age → BF start + (Bishop et al., 2008); young age → BF start – (Brown & Lee, 2011);  young age → BF period + (Brown et al., 2010; Dykes et al, 2003; Oakley et al., 2014); age → BF period – (Cooper et al., 1993)
Maternal age	Young age → BF start + (Bishop et al., 2008); young age → BF start – (Brown & Lee, 2011);  young age → BF period + (Brown et al., 2010; Dykes et al, 2003; Oakley et al., 2014); age → BF period – (Cooper et al., 1993)
Maternal age	Young age → BF start + (Bishop et al., 2008); young age → BF start – (Brown & Lee, 2011);  young age → BF period + (Brown et al., 2010; Dykes et al, 2003; Oakley et al., 2014); age → BF period – (Cooper et al., 1993)
Maternal education- al level	Low educational level → BF start + (Lawton et al., 2012); low educational level → BF period + (Brown et al., 2010; Cooper et al., 1993; Lawton et al., 2012)
SES	Low social class → BF start + (Bishop et al., 2008); low social class → BF period + (Brown et al., 2010; Cooper et al., 1993); high IMD → BF period + (Oakley et al., 2014)
One-parent family	One-parent status → BF start + (Bishop et al., 2008)
Ethnicity	White British ethnicity → BF start and period + (Lawton et al.; 2012); White ethnicity → BF start and BF period + (Oakley et al., 2014)
Maternal education- al level & ethnicity	Low educational level → BF start and period + independent of ethnicity (Lawton et al., 2012)
Social networks	Mothers → BF start + (Bishop et al., 2008); close family members → BF period + (Brown & Lee, 2011)
Young age & social networks	Adolescent mothers and lack of network support → BF period + (Dykes et al., 2003)

<b>Level</b>	<b>Impact of social determinant on breastfeeding periods</b>
<b>Macro level</b>	<b>Impact of social determinant on breastfeeding periods</b>
Culture	Social non-acceptance of breastfeeding → BF start + (Gatrell, 2007; Sittlington et al., 2007); norm to formula feed → BF start + (Bishop et al., 2008; Earle, 2002; Gatrell, 2007; Sittlington et al., 2007); positive attitude of mother towards breastfeeding → BF start – (Lawton et al., 2012; Sittlington et al., 2007); family culture → EBF – (Brown & Lee, 2011); body culture → BF start + (Earle, 2002); body culture → BF period + (Gatrell, 2007); medical culture → BF period + (Gatrell, 2007)
Religion	Muslim faith → BF start and period – (Williamson & Sacranie, 2012)
Workplace regulation	No provision of adequate space → BF period + (Gatrell, 2007)
Workplace regulation	No provision of adequate space → BF period + (Gatrell, 2007)
Parental leave	Resumption of work after termination of maternal leave period <6 months → BF period + (Gatrell, 2007)
<b>Ghana</b>	
<b>Micro level</b>	<b>Impact of Social Determinant on Breastfeeding Period</b>
Maternal age	Young age → BF onset + (Tawiah-Agyemang et al., 2008)
Maternal educational level	Low educational level → EBF + (Aidam et al., 2005); tertiary educational level → EBF + (Gladzah, 2013)
Wealth index/SES	Low wealth index → EBF + (Aidam et al., 2005); higher income level → EBF + (Gladzah, 2013)
Employment status	Employed → EBF + (Danso, 2014)
Gender of infant	Female newborn → BF onset + (Aborigo et al., 2012)
<b>Meso level</b>	<b>Impact of Social Determinant on Breastfeeding Period</b>
Social networks	Paternal grandmother → EBF + (Aborigo et al., 2012; Otoo et al., 2009), partner's negative attitude → EBF + (Aidam et al., 2005); family members → BF onset + (Tawiah-Agyemang et al., 2008)
Working conditions	Work schedule → EBF + (Danso, 2014; Gladzah, 2013)

<b>Level</b>	<b>Impact of social determinant on breastfeeding periods</b>
Maternal educational level & SES & working conditions	Tertiary educational level and higher income and managerial position (job inflexibility) → EBF +
<b>Macro level</b>	<b>Impact of Social Determinant on Breastfeeding Period</b>
Culture	Traditional rituals → BF onset + (Aborigo et al., 2012; Tawiah-Agyemang et al., 2008)
Religion	Traditional religion → BF onset + (Aborigo et al., 2012)
Workplace regulation	No provision of adequate space → EBF + (Danso, 2014; Gladzah, 2013; Otoo et al., 2009); no possibility for breastfeeding break → EBF + (Gladzah, 2013; Otoo et al., 2009)

### 6.3.2 Data Extraction and Realist Synthesis for Germany

For Germany, nine out of 16 anticipated social determinants were confirmed by the Realist Review (table 12). Retrieved studies were analyzed regarding start of, exclusive breastfeeding and the entire duration of breastfeeding, but none was identified regarding early onset. Besides, little information was revealed regarding how social determinants impact on breastfeeding in the given social context.

The following table summarizes those social determinants for which information were found in the studies compared to those that had been searched initially for as outlined in the C-M-O model (chapter 5.1.3).

**Table 12: Social Determinants Confirmed by the Realist Review: Germany**

<b>Social determinant confirmed</b>	<b>Social determinant not confirmed</b>
<b>Micro level</b>	
Maternal age, maternal educational level, SES, one-parent family, employment status, gender of infant, geographical location	Migration background, disability mother, disability child
<b>Meso level</b>	
Social networks	Working conditions
<b>Macro level</b>	
Culture	Religion, workplace regulation, paid maternal leave

As for the data reporting and synthesizing data, general information revealing an insight on factors influencing breastfeeding are stated first, followed by answers for the questions derived from the C-M-O model (chapter 5.1.3).

### **General findings:**

In health services, supplementary feeding during the hospital stay was still practiced impacting negatively on mothers' breastfeeding exclusively (Bergmann et al., 2002; Weißborn, 2007). Also, promotion of breastfeeding in hospitals was less influential than maternal age at birth (Dulon et al., 2003), whereas breastfeeding advice by a midwife during ANC or a pediatrician had a positive impact on the mother's decision to breastfeed (Libuda et al., 2014). Infants of both regions that received a pacifier during their first two weeks of life had a double increased chance to breastfeed short term, but those born in the area of the former GDR were given supplementary feedings more often and had later infant-to-breast contact with their mothers compared to those born in the FRG (Dulon et al., 2001).

In the following paragraph, those questions that were answered completely giving information on the social context, the respective social determinant and one or more breastfeeding periods are answered with quotations from the study.

### **Meso level**

#### **Question 11: How do social networks influence the breastfeeding period in the given social context in Germany?**

One study provided information on the social context.

#### **Wehrstedt, 2014**

Social context: home environment

Essential for successful breastfeeding beyond one year is support through the husband.

*He has always supported me, and helped me lots, particularly in the beginning with all that trouble.*

Having breastfed for approximately one year, the significant members of the social environment express their disapproval towards prolonged breastfeeding.

*Most of my environment is rather against it and argues this is spoiling the child, attaching the child too much to the mother, and that it is "unhealthy" for the mental state of the child.*

## **Macro level**

**Question 13: How does culture influence the breastfeeding period in the given social context in Germany?**

Wehrstedt, 2014

Context: health services

The medical culture represented by health professionals such as pediatricians might oppose breastfeeding beyond a year.

*My doctor lately said I would have to wean both kids immediately, as it will disturb their psychological development.*

The final table of the chapter for Germany visualizes the synthesized results in a table format. It displays level of social determinant, social context, social determinant and the specific effect on the respective breastfeeding period. The direction of the effect is indicated by an arrow: positive ↑ or negative ↓.

**Table 13: Synthesized Results from Germany**

<b>Social context</b>	<b>Social determinant</b>	<b>Breastfeeding period</b>	<b>Source</b>
	<b>Mechanism of effect</b>		
<b>Meso level</b>			
Home	Social networks	> 1 yr ↑	Wehrstedt, 2014
	Support by husband		
Home	Social networks	> 1 yr ↓	Wehrstedt, 2014
	Non-acceptance by family/peers		
<b>Macro level</b>			
Health services: PNC	Culture	> 1 yr ↓	Wehrstedt, 2014
	Medical culture not favorable		

### 6.3.3 Data Extraction and Realist Synthesis for the United Kingdom

For the United Kingdom, ten out of 16 social determinants were confirmed. Regarding early onset of breastfeeding, no study was identified, but there were findings about breastfeeding start in general, exclusive breastfeeding and the entire period. They proved relevant for four contexts: health services (ANC and hospital), home, the public environment and the work environment.

**Table 14: Social Determinants Confirmed by the Realist Review: United Kingdom**

Social determinant confirmed	Social determinant not confirmed
<b>Micro level</b>	
Maternal age, maternal educational level, SES, one-parent family, ethnicity	Employment status, gender of infant, disability mother, disability infant, geographical location
<b>Meso level</b>	
Social networks	Working conditions
<b>Macro level</b>	
Culture, religion, workplace regulation, parental leave	

#### **General findings:**

The majority of women took the decision on the feeding method of their child either before conception or at an early stage of pregnancy, and irrespective of having attended health services (Earle, 2002). Hence, attendance of ANC service did not show much impact on breastfeeding, as three quarters of mothers that had been breast-feeding and three quarters of mothers that were bottle feeding had attended it during pregnancy (Bishop et al., 2008).

As for OC, the longer a woman stayed in a hospital, the more likely she was to stop breastfeeding, whereas attendance of a breastfeeding clinic in PNC services had a positive effect on breastfeeding sustainment (Oakley et al., 2014). More than 90% of mothers stated that the information on breastfeeding delivered by their community midwives was helpful, compared to 20% of bottle feeding mothers who ranked it negatively. Breastfeeding clinics had the highest impact on breastfeeding maintenance compared to other types of breastfeeding support like voluntary, baby café, midwife (ibid).

## **Micro level**

### **Question 1: How does maternal age influence the breastfeeding period in the given social context in the United Kingdom?**

One study provided information on the social context.

Dykes et al., 2003

Social context: health services

Adolescent mothers were in need of five types of support in order to establish a successful lactation: emotional, esteem, instrumental, informational, and network support. The last one is not presented here, but under question 11 (social networks), neither informational that refers to written information like leaflets.

The type of support that was a precondition for the others to be acceptable was esteem support. These are examples for provision of support types in health services:

**Emotional support:** *the expression of empathy, caring, and concern toward the person*

*I wasn't asked how I was feeding. I was asked how many ounces is he having . . . then when I said I was breastfeeding they like looked and said "oh you're breastfeeding" and I was like . . . "yes" and they said "oh . . . that's good".*

**Esteem support:** *positive regard for the person, encouragement and agreement with the individual's ideas or feelings.*

*They (midwives) said "you're doing really really well" and that's when I really wanted to persevere with it.*

*If they had encouraged me a bit more when I was thinking about putting him on the bottle . . . like said why don't you give it another day I would have carried on . . . but they were just well . . . it's up to you.*

**Instrumental support:** *direct assistance of a practical nature*

*It was a bit pushy. I think they were coming in every half an hour to check, trying to get me to breastfeed a lot. There was a lot of pressure. I didn't get much help with the practical side of it at all.*

*They helped me get him on and then they were gone again.*

## **Meso level**

### **Question 11: How do social networks influence the breastfeeding period in the given social context in the United Kingdom?**

One study provided information on the social context.

Brown & Lee, 2011

Context: home

Mothers that had breastfed exclusively for six months pointed out that they would not have been successful without the support of their family members.

*My family were always supportive, more than that, it was just regarded as the normal way to feed my baby.*

A strong emphasis was laid on the partner's support:

*My husband was very supportive. He often tells me how proud he is. When it was hard at the start he did everything else for baby and in the house to allow me to concentrate on feeding and recovering from birth.*

**Question 1 and 11: relationship of maternal age and social networks**

Context: home

Dykes et al., 2003

Network support: *provides a feeling of membership in a group of people who share interests and social activities*

The adolescent mothers received the strongest and most effective support from their own families, especially their own mothers. On the other side, they reported that they felt watched and judged.

*I think that you always feel that you're being watched to see whether you're able to look after your baby. It puts you in a position of being so nervous about whether you're doing it right 'cause the older people are looking at what you're doing. They don't expect you to be able to do it because you're so young.*

**Macro level**

**Question 13: How does culture influence the breastfeeding period in the given social context in the United Kingdom?**

Two studies provided information on the context. Culture as a social determinant entailed six different dimensions: the social non-acceptance of breastfeeding, the norm to formula feed, positive attitude of the mother towards breastfeeding, family culture, body culture and medical culture.

## **Social non-acceptance of breastfeeding:**

Earle, 2002

Context: public

In contemporary society, breastfeeding has turned into a private matter that should be hidden from the public:

*The actual action of doing it wouldn't bother me at all. I would feel embarrassed in front of his family, I would say. Say I was in the middle of town and you get all these mothers that formula feed their babies, or even breastfeed them, I couldn't breastfeed a baby in the middle of town.*

Gatrell, 2007

Context: public

Women report that it was not possible for them to breastfeed in public. Estelle was made so unwelcome that she was asked to leave public spaces.

*Jack brought the baby to me and I used to go into this cafe´ which I had previously supported. But one day I breastfed my baby daughter in there. And they asked me to leave and not to come back...*

Gatrell, 2007

Context: work

Mothers that were breastfeeding and returned to work stopped because of the challenges they felt not to be able to cope with. This was due to several reasons, among others the need of *managing their lactating bodies, especially leakage of milk.*

*When I first went back to work, I wanted to return initially for 3 days per week so I could breastfeed, but permission was refused. I think they thought this would stop me breastfeeding, which they said was 'unsuitable' at work. I think they were worried about leakage and I was anxious about this as well, it's like: 'how do you control all this milk?'*

## **Medical culture:**

Gatrell, 2007

Context: health services

Women narrate about their unexpectedly unpleasant birthing experience in health services impairing onset of lactation, about which they express their emotional concern.

*I had this dreadful, shocking hospital delivery, then enormous problems breastfeeding him, so I didn't enjoy and gave up. But I felt so guilty [...].*

**Question 14: How does religion influence the breastfeeding period in the given social context in the United Kingdom?**

Williamson & Sacranie, 2012

Social context: health services

A woman reported that she received information provided in ANC which were identical with information that she had received attending religious services.

*I went for these antenatal classes where they [midwives] gave me leaflets on breastfeeding with diagrams (...) They were promoting breastfeeding a lot now as well as talking about the same benefits that I knew from going to the mosque.*

**Question 15: How does workplace regulation influence the breastfeeding period in the given context in the United Kingdom?**

Gatrell, 2007

Social context: work

There was no provision of an appropriate space to breastfeed and/or express and store breast milk:

*Breastfeeding? In school? Putting breastmilk in the staff fridge? You're joking. You can smell the testosterone when you walk in the door and you have to fit in, which obviously you can't do if you're breastfeeding [...].*

*Diana, a television news producer, returned to employment when her daughter was almost 5 months old, having breastfed exclusively until this point. There was nowhere in the newsroom to accommodate the expressing of breastmilk and she found it difficult to 'hide somewhere'.*

*Estelle recounted how, when she was running clinics, there were no facilities for breastfeeding. Nobody enquired how she was managing to combine work with new motherhood and Estelle took this as a sign that she should breastfeed secretly.*

**Question 16: How does parental leave influence the breastfeeding period in the given context in the United Kingdom?**

Gatrell, 2007

Social context: work

The period of legal maternity leave in the UK does not cover the recommended period of six months to breastfeed exclusively. Women reported that on returning to their workplace, they had to stop breastfeeding.

*[...] I hated giving up and [baby] cried because she wanted me, but I had to get back to work and the Head was not best pleased with me anyway, being off on maternity leave. So I needed to work at fitting back in, so breastfeeding was out of the question.*

Though employers eventually grant extra (unpaid) time off for maternity leave, six months were not reached.

*I had a terrible few weeks trying to prepare myself. I had four months' maternity leave and when you have this little person and you're breastfeeding exclusively, it's a wonderful sort of bonding thing, it's very intimate and I didn't want to leave him. [...] it took me months to adjust and stop feeling resentful against them because they had made me give up breastfeeding.*

Due to the increased economic pressure, one woman was even reluctant to take the legally granted period for maternity leave.

*Estelle, a psychotherapist, also continued to feed her baby directly from the breast during the working day. When her daughter was born, Estelle was in a new post in which vocational training was an integrated part. Estelle feared that taking maternity leave would compromise her chances of continuing as a psychotherapist and she thus returned to work when her daughter was 3 weeks old.*

Synthesized results are also presented by themselves in table 15 displaying level of social determinant, social context, social determinant and the specific effect on the respective breastfeeding period. The direction of the effect is indicated by an arrow: positive ↑ or negative ↓.

**Table 15: Synthesized Results from the United Kingdom**

<b>Social context</b>	<b>Social determinant</b>	<b>Breastfeeding period</b>	<b>Source</b>
	<b>Mechanism of effect</b>		
<b>Micro level</b>			
Health services: hospital	Maternal age (adolescents)	Continuation of breastfeeding during hospital stay ↓↑	Dykes et al., 2003
	Support by medical staff		
<b>Meso level</b>			
Home	Social networks	Exclusive = 6 mo ↓	Brown & Lee, 2011

<b>Social context</b>	<b>Social determinant</b>	<b>Breastfeeding period</b>	<b>Source</b>
	<b>Mechanism of effect</b>		
	Support by husband/family members		
<b>Macro level</b>			
Public	Culture	Start & continuation ↓	Earle, 2002
	Social non-acceptance		
Public	Culture	Start & continuation ↓	Gatrell, 2007
	Social non-acceptance		
Public	Culture	Start & continuation ↓	Earle, 2002
	Sexualization of breasts		
Work	Culture	Continuation ↓	Gatrell, 2007
	Control of "leakage"		
<b>Social context</b>	<b>Social determinant</b>	<b>Breastfeeding period</b>	<b>Source</b>
	<b>Mechanism of effect</b>		
Health services: hospital	Culture	Continuation ↓	Gatrell, 2007
	Medical culture unfavorable		
Health services: ANC	Religion	≤ 2 yr ↑	Williamson & Sacranie, 2012
	WHO recommendations regarding length identical with those from Muslim religion		
Work	Workplace regulation	Exclusive = 6 mo ↓ Continuation ↓	Gatrell, 2007

<b>Social context</b>	<b>Social determinant</b>	<b>Breastfeeding period</b>	<b>Source</b>
	<b>Mechanism of effect</b>		
	No provision of space for expression and/or storage of breast milk		
Work	Maternal leave	Continuation ↓	Gatrell, 2007
	Reduced periods because of economic constraints (fear to lose the job)		

**6.3.4 Data Extraction and Realist Synthesis for Ghana**

For Ghana, studies were analyzed for all breastfeeding stages, and information retrieved regarding effects of social determinants in given social contexts.

**Table 16: Social Determinants Confirmed by the Realist Review: Ghana**

Social determinant confirmed	Social determinant not confirmed
<b>Micro level</b>	
Maternal age, maternal educational level, wealth index/SES, employment status, gender of infant	One-parent family, ethnicity/tribe, disability of mother, disability of infant, geographical location, food insecurity
<b>Meso level</b>	
Social networks, working conditions	Polygyny
<b>Macro level</b>	
Culture, religion, workplace regulation	Parental leave

**General findings:**

In any type of birth place, delivery assistants were in charge to decide when the baby will be breastfed for the first time (Aidam et al, 2005; Tawiah-Agyemang et al., 2008). New mothers, especially when they delivered for the first time, often were not in a position to take the final decision about the feeding method of her infant (Tawiah-Agyemang et al., 2008). Regarding place of delivery, women that gave birth in a setting like maternity home/private clinic/at home were half as likely to exclusively breastfeed compared to when delivered in a governmental hospital, whereby most of these are certified as baby-friendly as opposed to the other delivery institutions (Aidam et al., 2005).

Besides, prenatal and postnatal professional breastfeeding support was markedly lower compared to the one received in the obstetric setting (Aidam et al., 2005; Tawiah-Agyemang et al., 2008).

### **Micro level**

#### **Question 1: How does maternal age influence the breastfeeding period in the given social context in Ghana?**

Tawiah-Agyemang et al., 2008

Social context: home

A 15-year old woman who gave birth at home had started breastfeeding 54 hours after her delivery.

*The breast was flat and she realized that nothing came out of it.*

In rural/traditional areas, mothers with newborns follow the advice of either nurse or traditional health staff/family members, whereby young women seem to be a risk group for delayed onset especially in a home birth setting. Health facility delivery had a positive impact on early onset in general.

#### **Question 7: How does gender of infant influence the breastfeeding period in the given social context in Ghana?**

Aborigo et al., 2012

Social context: home

In the given context of traditional worshippers, onset of breastfeeding was delayed in first-time mothers according to gender of infant. Tradition required that ritual cleansing of the recent mother had to be performed before starting to breastfeed, which lasts three days in the case of male infants, and four days for female infants. Moreover, there was an overlap with another cultural practice in first-time mothers where the colostrum is subject to a test and in case of a negative test result yet another cleansing has to be performed. Newborns were then nurtured on the basis of tea or through a wet nurse from the neighborhood.

### **Meso level**

#### **Question 12: How do social networks influence the breastfeeding period in the given social context in Ghana?**

Two studies provided information on the context.

Aborigo et al., 2012

Social context: health services

A mother of a newborn who had two or more deliveries said that

*When you deliver in the hospital, you breastfeed and continue at home.*

However, delivering outside the hospital may prevent women from immediately breastfeeding or maintaining exclusive breastfeeding in the face of competing advice of TBAs, grandmothers, and other community members. Members from the social network, especially the paternal grandmother of the child had significant influence in regards to decision-making about how the infant will be fed.

*They have told us that the baby should not drink water until six months but some will ignore that and still give the baby water.*

Tawiah-Agyemang et al., 2008

Social context: home

On the other side, a second-time mother having delivered at home started breastfeeding 54 hours after birth reported that

*I didn't get any advice this time because I was old enough to know what to do with my baby.*

**Question 13: How do working conditions influence the breastfeeding period in the given social context in Ghana?**

Danso, 2014

Social context: work

Although mothers were aware of the importance to exclusively breastfeed, half of the full-time formally employed mothers explained that they were not able to continue this practice after resuming work, since their infant had to stay at home because of stress levels at the workplace. Women were employed in a variety of areas as education, health, banking/finance/insurance, telecommunication, media/information, civil societies, NGOs, ministries and security agencies, among others.

Gladzah, 2013

Social context:

Among health professionals employed in two hospitals, 6% had a work load for less than four hours a day compared to 89%, who were working between four and eight hours a day. Half of mothers from the second group stated that their schedule at work was incompatible with practicing exclusive breastfeeding, aggravated by the fact that colleagues at work would not tolerate them closing earlier from work to breastfeed their infants.

## **Question 2, 3 and 13: relationship of maternal educational level, SES and working conditions**

Women with a tertiary education have higher income levels, and are more likely to hold managerial positions, which do not offer the job flexibility to continue with exclusive breastfeeding.

### **Macro level**

## **Question 14: How does culture influence the breastfeeding period in the given social context in Ghana?**

Aborigo et al., 2012

Social context: home

As already explained under Question 7, first-time mothers had to undergo a ritual cleansing. Aside from that, their colostrum was tested. Both procedures delayed onset of breastfeeding.

*If it is the first time the woman delivers. They will press out the woman's breast milk into a container and put some ants inside it. If the ants die, it means the breast milk is bitter and not good for the baby but if the ants don't die then they will allow it to suck the breast milk.*

The newborns were either fed by a wet nurse or with herbal teas. The first option was considered as challenging, since

*There are so many diseases with us so they (mothers) don't allow other nursing mothers to breastfeed the babies.*

Tawiah-Agyemang et al., 2008

Social context: home

During home deliveries the negative beliefs about colostrum could incur a delay in onset and ultimately impede the feeding of colostrum.

*She doesn't give the first breast milk to the baby on the first day after birth. She gives the breast milk to the baby the next day after birth when the first breast milk has mixed with the second breast milk.*

*She squeezed the first breast milk away until the white milk came because the former wasn't good. Then she breastfed the baby with the white milk.*

**Question 15: How does religion influence the breastfeeding period in the given social context in Ghana?**

Aborigo et al., 2012

Social context: home

Religion was important regarding the selection of the birth setting as well as adherence to breastfeeding recommendations. During home birth, traditional spiritual leaders were gatekeepers for the decision when an infant was allowed to be breastfed. According to them, on the first day the newborn should not receive anything because the Gods have to be consulted first. Christian communities confirmed that they adhere to breastfeeding recommendations, which they called *the new law*.

**Question 16: How does workplace regulation influence the breastfeeding period in the given social context in Ghana?**

Danso, 2014

Social context: work

Almost one fifth of the full-time, formally employed mothers stated that there was no proper location provided at the workplace to breastfeed their child. Thus, they had either the option to go home during their regular break to breastfeed, or a family member would bring the child to the workplace, so it could be fed there.

Gladzah, 2013

Social context: work

Regarding the workplace regulation at two hospitals, 71% of mothers confirmed that they were entitled to a one-hour break to feed their children. However, 65.4% answered the reason why they discontinued exclusive breastfeeding was the fact that there was no provision of a place suitable for breastfeeding.

Otoo et al., 2009

Social context: work (formal and informal)

The main barrier to exclusive breastfeeding was considered maternal employment. Working mothers stated that they did not have enough time to breastfeed their infants exclusively because of the inability to find a convenient feeding location, especially in the case for mothers who hawk their products or are busy trading in the market.

Table 15 shows synthesized results for Ghana, with level of social determinant, social context, social determinant and the specific effect on the respective breastfeeding period. The direction of the effect is indicated by an arrow: positive ↑ or negative ↓.

**Table 17: Synthesized Results for Ghana**

<b>Social context</b>	<b>Social determinant</b>	<b>Breastfeeding period</b>	<b>Source</b>
	<b>Mechanism of effect</b>		
<b>Micro level</b>			
Home	Maternal age (adolescent)	Onset ↓ (delayed)	Tawiah-Agyemang et al., 2008
	Advice from delivery assistant/family members for mothers of young age		
Home	Gender of infant	Onset ↓ (delayed)	Aborigo et al., 2012
	Ritual cleansing of mother	Male gender → delay of 3 days; female gender → delay of 3 days	
<b>Meso level</b>			
Health services	Social networks →	Exclusive = 6 mo ↑	Aborigo et al., 2012
	Respect for instructions on breastfeeding from medical staff		
Home	Social networks →	Onset ↓ (delayed)	Tawiah-Agyemang et al., 2008
	No advice mothers who gave birth to second or more child		
Work	Working conditions	Exclusive = 6 mo ↓	Danso, 2014

Social context	Social determinant	Breastfeeding period	Source
	<b>Mechanism of effect</b>		
	Full-time employed mothers suffer from elevated stress levels		
Work	Working conditions	Exclusive = 6 mo ↓	Gladzah, 2013
	Work schedule for full-time employed mothers is incompatible schedule breastfeeding breaks aggravated by lack of cooperation from colleagues		
<b>Macro level</b>			
Home	Culture	Onset ↓ (delayed)	Aborigo et al., 2012
	Exam of quality of colostrum		
Home	Culture	Onset ↓ (delayed)	Tawiah-Agyemang et al., 2008
	Beliefs about harmful effects of colostrum		
Home	Religion	Onset ↓ (delayed)	Aborigo et al., 2012
	Traditional spiritual leaders' advice on point-in-time of onset is mandatory		
Work	Workplace regulation	Exclusive = 6 mo ↓	Danso, 2014

Social context	Social determinant	Breastfeeding period	Source
	<b>Mechanism of effect</b>		
	No provision of proper space to breastfeed and/or express breast milk		
Work	Workplace regulation	Exclusive = 6 mo ↓	Gladzah, 2013
	No provision of proper space to breastfeed and/or express breast milk		
Work	Formal and informal workplace	Exclusive = 6 mo ↓	Otoo et al., 2009
	No provision of proper space to breastfeed and/or express breast milk		

#### 6.4 Results from Guideline Appraisal with AGREE II

Guidelines were first appraised for their quality with the AGREE II tool. Then periods recommended for breastfeeding were identified, and an analysis with the BIAS FREE Framework conducted for each guideline. The original versions of the guidelines are attached to the annex (D3).

All guidelines had been appraised by two appraisers using the standard instrument AGREE II (AGREE, 2013). Scores were calculated for each domain as explained in the methods chapter under 5.2.4. The domain scores were calculated by adding all scores from both appraisers. The result was then counted as the percentage of the maximum possible score for the respective domain. Then the overall assessment followed (1-7, with one lowest and 7 highest possible quality), and finally whether the guideline was recommended for use or not. Two versions per guideline entailing scores from the respective appraiser are added to the annex (D1).

As outlined in the methods chapter, three domains were subject to an emphasized interest: domain 2 'Stakeholder Involvement', domain 3 'Rigor of Development' and finally domain 6 'Editorial Independence'.

In terms of the overall assessment, all guidelines were recommended for use except for one vote for the Guideline for the Healthy Term Newborn in the Birth Clinic; registry no. 024 – 005. Regarding the appraisal per domain, the guidelines from Germany received lower ratings, those from Ghana middle and from the United Kingdom higher. Detailed information is displayed in the tables below. First, the averaged proportion from results of the two appraisals in regards to the highest achievable ranking was calculated and presented per domain, followed by a separate overall ranking, and a possible recommendation for use with/- or without modifications or not.

#### 6.4.1 Results from the AGREE II Appraisal: Germany

Two guidelines had been appraised for Germany, the Guideline for the Healthy Term Newborn in the Birth Clinic; registry no. 024 - 005 (Betreuung des gesunden, reifen Neugeborenen in der Geburtsklinik) and the Guideline for Prevention of Allergies; registry no. 061-016 (Leitlinie Allergieprävention) by RW and GK and the scores reported in Table 18.

**Table 18: Guideline Appraisals with AGREE II: Germany**

	Guideline for the Healthy Term Newborn in the Birth Clinic; registry no. 024 - 005	Guideline for Prevention of Allergies; registry no. 061-016
Domain	Averaged proportion of maximum score in % of both appraisals	Averaged proportion of maximum score in % of both appraisals
1: Scope and purpose	25%	92%
2: Stakeholder involvement	33%	66%
3: Rigor of development	30%	77%
4: Clarity of presentation	58%	61%
5: Applicability	37%	56%
6: Editorial independence	29%	54%
Overall Assessment (score 1 - 7)		
Appraiser RW	2	5
Appraiser GK	4	5
Recommendations for use		
Appraiser RW	no	yes, with modifications
Appraiser GK	yes, with modifications	yes

The first guideline that was appraised, Guideline for the Healthy Term Newborn in the Birth Clinic, received the lowest rating of all guidelines (2/4), and was recommended for use with modifications from one appraiser (GK) and not recommended by RW. As for the three domains that were of particular interest, concerning involvement of stakeholders two major professional groups that work in maternity care, pediatric and maternity nurses, were not involved for the guideline elaboration, neither was the target group clearly defined and nor opinions and/or choices from them considered. As for the rigidity with which the guideline was elaborated, the level of evidence S2k is indicated, which signifies it is based on expert's consensus. Naturally, no evidence to support the recommendations was provided. Regarding domain 6 'Editorial Independence', one expert had received remuneration for presentations from Nestlé and Milupa, one from Nestlé and a third one from the Nestlé Nutrition Institute (Addendum declaration of interests, no date). There was no declaration of conflicts of interest.

The second guideline that was subject to research, Guideline for Prevention of Allergies, was rated higher, but remains at rank second lowest (5/5). As for stakeholder involvement (domain 2), disciplines were not specifically cited, but the explanation refers to those who are involved like physicians and non-physicians (p. 6), but views and preferences of the target populations were not looked for and therefore not considered. The building of the evidence-base followed systematic criteria that are disclosed including a link as well as limitations are described (p.6). As for the editorial independence, there was one expert that had remunerated presentations with Mead Johnson and Nestlé respectively, one with Danone and Nestlé, one Danone and Mead Johnson, one from Abbott, Danone, Hipp, and Nestlé, one received a donation from Mead Johnson and Nestlé, and one from Nestlé and the milk industry of Bavaria/Baden-Württemberg, and finally one received a research grant from Hipp (Leitlinienreport zur Methodik der S3-Leitlinie 061/016: Allergieprävention, pp. 14-19). There was no declaration of conflicts of interest.

#### **6.4.2 Results from the AGREE II Appraisal: United Kingdom**

The two guidelines appraised by RW and AT for the United Kingdom were CG37 Routine and Postnatal Care of Women and their Babies, and the Public Health guideline PH11. Result scores were as follows:

**Table 19: Guideline Appraisals with AGREE II: United Kingdom**

	CG37 Routine and Postnatal Care of Women and their Babies	Public Health Guideline PH11
Domain	Averaged proportion of maximum score in %	Averaged proportion of maximum score in %
1: Scope and purpose	97%	100%
2: Stakeholder involvement	70%	92%
3: Rigor of development	88%	97%
4: Clarity of presentation	92%	100%
5: Applicability	82%	62%
6: Editorial independence	62%	42%
Overall assessment (score 1 - 7)		
Appraiser RW	6	6
Appraiser AT	7	7
Recommendations for use		
Appraiser RW	yes	yes
Appraiser AT	yes	yes

Both guidelines from the United Kingdom received the highest ranking among all (6/7). The first guideline that was appraised was the Clinical Practice Guideline CG37 Routine and Postnatal Care of Women and their Babies. As for domain 2, stakeholder involvement, all relevant stakeholders had been involved in the guideline development including patients and carers (p. 40). All relevant criteria how the evidence-base was derived are stated in the background document elaborated by the University of Leicester (Demott et al., 2006; p. 42 explanation and p.47 table with recommendations). For the final domain, independence of guideline developers, no expert had pursued pecuniary interests from an infant formula producing industry. There is a declaration in regards to conflict of interest.

The second guideline under revision, the Public Health Guideline PH11, was recommended in CG 37 as a complementary guideline to consult for the postnatal period. All relevant professional groups participated in the guideline elaboration, but no breastfeeding mothers except one member of the community that is a “Community Member, Supporter and Tutor with

the Breastfeeding Network” (p. 63). As for the editorial independence, although all members and their institutional affiliation were disclosed and did not represent any formula producing industry, there is no declaration of pecuniary interest in the PH 11 guideline.

### 6.4.3 Results from the AGREE II Appraisal: Ghana

For Ghana, a policy document and a guideline were appraised by RW and LDK. First, the Under Five’s Child Health Policy: 2007-2015, and second, the National Guideline for Prevention of Mother-To-Child-Transmission of HIV. The following scores were obtained:

**Table 20: Guideline Appraisals with AGREE II: Ghana**

	Under Five’s Child Health Policy: 2007-2015	National Guideline for Prevention of Mother-To-Child-Transmission of HIV
Domain	Averaged proportion of maximum score in %	Averaged proportion of maximum score in %
1: Scope and purpose	97%	94%
2: Stakeholder involvement	69%	36%
3: Rigor of development	30%	22%
4: Clarity of presentation	94%	86%
5: Applicability	66%	56%
6: Editorial independence	37%	21%
Overall assessment (score 1 - 7)		
Appraiser RW	5	4
Appraiser LDK	6	5
Recommendations for use		
Appraiser RW	yes, with modifications	yes, with modifications
Appraiser LDK	yes	yes, with modifications

Compared to the other four guidelines that had been previously appraised, the Under Five’s Child Health Policy: 2007-2015 and the National Guideline for Prevention of Mother-To-Child-Transmission of HIV were ranked as middle quality (5/6 and 4/5). As for the policy, all relevant professional groups were involved in developing the guideline, but not the views and preferences of those who are addressed by it. As for the rigor of development, the background and statement of problem is portrayed in-depth, but not whether a systematic ap-

proach had been employed, neither a link to the evidence-base. Finally, the members of the policy development are stated including their institutional affiliation, but not whether there were any conflict of interests.

The results from the appraisal were also true for the second document, the National Guideline for Prevention of Mother-To-Child-Transmission of HIV except for the fact that the evidence-base was derived from the original WHO guideline (p. 7) and not adapted to the situation at stake in Ghana.

## **6.5 Determination of Breastfeeding Periods**

The next step was to verify whether the guidelines under research addressed breastfeeding stages according to the WHO recommendations. The first column states the respective guideline, followed by mentioning of timing of onset, recommended duration of exclusive breastfeeding, and finally optimal duration of breastfeeding. Respective parts and quotations are stated in *Italics*.

**Table 21: Assessment of Breastfeeding Periods of All Guidelines**

<b>Guideline</b>	<b>Onset of breastfeeding within one hour after birth</b>	<b>Exclusive breastfeeding 6 months</b>	<b>Total breastfeeding length 24 months</b>
Guideline for the Healthy Term Newborn in the Birth Clinic; registry no. 024 - 005	P.3 [...] as soon as possible ( <i>so bald als möglich</i> )	P.6 [...] <i>restriction of supplementary feeding during hospital stay</i>	Not specified
Guideline for Prevention of Allergies; registry no. 061-016	Not specified	P. 2 <i>for full 4 months</i> p. 13 [...] <i>not prolonged</i>	Not specified
CG37 Routine and Postnatal Care of Women and their Babies	P. 21 <i>Initiation of breastfeeding should be encouraged as soon as possible after the birth, ideally within 1 hour.</i>	P. 20 [...] <i>formula milk should not be fed unless medically indicated during hospital stay</i>	Not specified (P. 21 and 22 mentioning of breastfeeding duration)
Public Health Guideline PH11	Not specified	P. 14 <i>Current UK policy is to promote exclusive breast-feeding (feeding only breast milk) for the first 6 months.</i>	Not specified (P. 14 <i>Thereafter, it recommends that breastfeeding should continue for as long as the mother and baby wish [...].</i> )
Under Five's Child Health Policy: 2007-2015	P. 11 <i>Breastfeeding initiation within 30 minutes after delivery. No pre-lacteal feeds.</i>	P. 12 <i>Exclusive BF to 6 months</i> P. 13 <i>Exclusive breastfeeding will be promoted from birth to 6 months (children less than 180 days)</i>	P. 12 <i>Continued breastfeeding to 2 years and beyond</i>
National Guideline for Prevention of Mother To Child Transmission of HIV	Not specified	P. 19 1.a. <i>Exclusive Breastfeeding for six months</i>	P. 19 <i>When mother decides to stop breastfeeding she shall be supported to completely cease breastfeeding the infant within two weeks.</i>  <i>Note: Mixed feeding should always be avoided.</i>

## 6.6 Results of Guideline Analyses with the BIAS FREE Framework

In this chapter results from the last step of guideline analyses that was performed with the BIAS FREE Framework is presented.

First, the instrument was adapted according to findings from the Realist Review provided in Table 6. Then all six guidelines were analyzed, and results are displayed per guideline evaluation. All parts relevant for breastfeeding were scrutinized for problem types. They are cited in full length, highlighted in bold letters, stating the respective page, followed by the text passage, the detected problem type and the pertinent social determinant, justified with arguments based on the results from the Realist Synthesis. Text passages where breastfeeding was mentioned and that were analyzed are presented in italics In order to distinguish them from the other parts. Repetitions were not counted double.

Moreover, in the annex (D2), tables are provided with a template of the BIAS FREE Framework for every guideline, where every problem type is marked when applicable, but without a justification.

The aim of this analysis was to detect if a relationship between the breastfeeding behavior of mother and social determinants confirmed by the realist Review is reflected in guidelines. The idea is to facilitate breastfeeding for all mothers in order to furnish all children with the same chance to enjoy a healthy start in life. The different needs and implications to accomplish this are part of a solution that is not provided in this analysis, which is restricted to the detection of vulnerable groups and the provision of an argument based on study results.

The next table is an overview of detected problem subtypes according to social determinant and guideline. For a better visualization, these colors were assigned to each guideline:

- Guideline for the Healthy Term Newborn in the Birth Clinic (GER)
- Guideline for Prevention of Allergies (GER)
- Clinical Guideline Routine and Postnatal Care of Women and their Babies (UK)
- Public Health Guidance Maternal and Child Nutrition (UK)
- Under Five's Child Health Policy (GH)
- National Guideline for Prevention of Mother-To-Child Transmission of HIV (GH)

**Table 22: Summary of Guideline Analyses with the BIAS FREE Framework (Burke & Eichler, 2006)**

Social determinant	Matern age	Matern educ level	SES/ wealth index	One-parent family	Employ ment status	Ethnicity	Gender of infant	Geogr location	Social net-works	Work con-conditions	Culture	Religion	Work regulat ion	Parent leave
<b>Problem type</b>														
<b>H - Maintaining an existing hierarchy</b>														
H1 Denying hierarchy														
H2 Maintaining hierarchy	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■	■	■ ■	■		■ ■ ■ ■	■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■
H3 Dominant perspective														
H4 Pathologization														
H5 Objectification														
H6 Victim-blaming														
H7 Appropriation														
<b>F - Failing to examine differences</b>														
F1 Insensitivity to differences	■ ■ ■ ■ ■	■ ■ ■ ■ ■	■ ■ ■ ■ ■			■	■ ■ ■ ■ ■	■ ■						
F2 Decontextualization				■ ■	■ ■ ■ ■ ■				■ ■ ■ ■ ■ ■	■ ■	■ ■ ■ ■ ■	■ ■	■ ■ ■ ■	■ ■
F3 Overgeneralization or universalization														
F4 Assumed homogeneity	■ ■	■ ■												
<b>D - Using double standards</b>														
D1 Overt double standard														
D2 Under representation or exclusion	■ ■	■	■	■ ■ ■ ■		■ ■	■		■ ■ ■ ■		■ ■	■		
D3 Exceptional under representation or exclusion														
D4 Denying agency														
D5 Treating dominant opinions as facts														
D6 Stereotyping														
D 7 Exaggerating differences														
D8 Hidden double standards														

### 6.6.1 Analysis of Clinical Practice Guideline, Germany

For the analysis of CPG 024/005, there were two sections under p. 7/3.4 and p.10/4., where an early supplementary feeding was required due to medical reasons caused by digestive and metabolic problems that were not subject to analysis. An overview of all detected problem types is provided and the corresponding social determinant. Then the corresponding text passages are cited and problem types, social determinants and justifications provided.

**Table 23: Identified Problem Types and Social Determinants, Clinical Practice Guideline 024/005, Germany**

Problem type	Social Determinant	Frequency absolute	Frequency per social determinant
F1 Insensitivity to differences		16	
	Maternal age		3
	Maternal educational level		3
	SES		3
	Gender of infant		3
	Geographical location		4
F2 Decontextualization		13	
	One-parent family		3
	Employment status		3
	Social networks		4
	Culture		1
F4 Assumed homogeneity		3	
	Maternal age/maternal educational level		3
D2 Underrepresentation or Exclusion		2	
	One-parent family		1
	Social networks		1

### **P. 3, 2.3**

***Sobald wie möglich wird das Neugeborene erstmalig gestillt. Der Hautkontakt sollte ermöglicht und möglichst wenig gestört werden.***

Social determinant: geographical location

Problem type: F1 Insensitivity to differences

Justification: In general, mothers from East German descent started breastfeeding more often than from West German descent. However, there were differences in early infant-to-breast contact according to location of birth, an essential component to implement successful breastfeeding. The difference should be acknowledged by emphasizing early infant-to-breast within a certain period of time including early onset of breastfeeding.

### **P. 5, 3.2**

***Muttermilch ist die natürliche Nahrung für Neugeborene; das vorrangige Stillen während des Aufenthalts auf der Wochenstation muss unterstützt werden.***

In order to support breastfeeding, the following social determinants need to be considered:

Social determinant: maternal age

Problem type: F1 Insensitivity to differences

Justification: Younger mothers tend to breastfeed less often and for a shorter breastfeeding period than older mothers. There was evidence for women aged 20 to 25, and an association between increasing age and frequency of breastfeeding.

Social determinant: maternal educational level

Problem type: F1 Insensitivity to differences

Justification: Women with a secondary educational and lower level had shorter breastfeeding rates compared to mothers with a high school degree and/or university degree.

Social determinant: SES

Problem type: F1 Insensitivity to differences

Justification: Starting to breastfeed as well as practicing exclusive breastfeeding is influenced by the socioeconomic position of a woman. The higher the SES of the family/mother, the more likely she was to breastfeed and the longer the exclusive breastfeeding period. There was evidence that social status exercised a stronger influence than other maternal characteristics implying that women with a low SES need special attention and support to establish breastfeeding successfully.

Social determinant: gender of infant

Problem type: F1 Insensitivity to differences

Justification: The breastfeeding period can vary according to the gender of the infant with male children less likely to be breastfed as long as female children.

Social determinant: geographical location

Problem type: F1 Insensitivity to differences

Justification: East German mothers tend to breastfeed more frequently, but for a shortened period. This was partly due to the need to return to work, but also accompanied by complaints that they could not produce sufficient breast milk. There was evidence that newborns received more supplementary feeding during their stay in hospitals located in the Eastern region, which is known to impair the physiology of lactation. Exclusive breastfeeding therefore needs to be emphasized.

Social determinants: maternal age, maternal educational level

Problem type: F4 assumed homogeneity

Justification: Young women with a low/lower educational level are especially vulnerable, since these two determinants have an effect that adds to each other resulting in even more reduced breastfeeding periods than those belonging to one group.

Social determinant: one-parent family

Problem type: F2 Decontextualization

Justification: Mothers living in one-parent families tend to breastfeed less often and for a shorter period of time. They require special attention and support.

Social determinant: employment status

Problem type: F2 Decontextualization

Justification: Women who are employed and have to resume work due to financial or other restraints prior to the end of maternity leave are much more likely to not breastfeed or to practice short term breastfeeding compared to those who take the entire period of maternal leave.

Social determinant: social networks

Problem type: F2 Decontextualization

Justification: the social network of a mother aside from her partner represented by other members of the family, friends and peers was considered as important for short term and long term breastfeeding success. They also have to be involved during breastfeeding counselling.

#### **P. 5, 3.2 a**

#### **Information und Beratung der Mutter/Eltern über das Stillen**

Social determinant: social networks

Problem type: F2 Decontextualization

Justification: same as p. 5, 3.2

**Eine Stillrichtlinie, die von allen an der Betreuung von Wöchnerinnen und Neugeborenen beteiligten Personen umgesetzt wird, verbessert die Einheitlichkeit der Stillberatung.**

No problem type detected.

#### **P. 5, 3.2.b**

**Ein ungestörtes Zusammensein von Mutter und Neugeborenem und *das erste Anlegen sollen bereits im Kreißsaal erfolgen.***

There were no data subject to analysis regarding early onset of breastfeeding and social determinants. However, an emphasis to start breastfeeding during the first hour after birth would facilitate implementation of successful lactation.

### **P. 6, 3.2.c**

***Den Eltern muss die Notwendigkeit des Zufütterns ausreichend erklärt werden.***

Social determinant: one-parent family, social networks

Problem type: D2 Under representation or exclusion

Justification: Mothers living as one-parent families should also be addressed, especially in the view of the fact that they tend to have lower and shorter breastfeeding rates and supplementary feeding can impair lactation.

Other relevant members of the social network should be involved during counseling in order to support the mother adequately.

**Mütter, die sich entscheiden, ihr Kind nicht zu stillen, sollten in ihrer Entscheidung respektiert werden und alle fachlichen Informationen und Unterstützungen für die Ernährung ihres Kindes mit einer Säuglingsanfangsnahrung erhalten.**

No problem type detected.

### **P. 9, 3.6**

**Empfehlungen zur Prävention des plötzlichen Säuglingstods**

**- Stillen**

Breastfeeding is considered as a primary prevention from sudden infant death, which can still occur in the second year of a child's life. Therefore, all social determinants that affect breastfeeding initiation and duration need to be addressed.

Social determinants: maternal age, maternal educational level, SES, gender of infant, geographical location

Problem type: F1 Insensitivity to differences

Justification: same as p. 5, 3.2

Social determinants: maternal educational level, maternal age

Problem type: F4 Assumed homogeneity

Justification: same as p. 5, 3.2

Social determinants: one-parent family, employment status, social networks, culture

Problem type: F2 Decontextualization

Justification: same as p. 5, 3.2

**P. 10, 4.**

**Besonders nach sogenannter ambulanter (kurzstationärer) Entbindung oder Frühentlassung mit einem postnatalen Alter von unter 48 Stunden sind Hebammen, Geburtshelfer und/oder Kinderarzt verantwortlich für eine ausreichende Klärung folgender Punkte:**

**- Die Mutter muss ausreichend über das Stillen bzw. über eine Ernährung ihres Kindes mit einer Säuglingsanfangsnahrung informiert sein.**

A mother should be informed by the respective health staff (midwives, physicians, nurses, pediatric nurses) about risks and benefits in regards to the social determinants that influence breastfeeding to raise their awareness and support her to establish and sustain breastfeeding.

Social determinants: maternal age, maternal educational level, SES, gender of infant, geographical location

Problem type: F1 Insensitivity to differences

Justification: same as p.5, 3.2

Social determinants: maternal educational level, maternal age

Problem type: F4 assumed homogeneity

Justification: same as p.5, 3.2

Social determinants: one-parent family, employment status

Problem type: F2 Decontextualization

Justification: same as p.5, 3.2

Social determinant: social networks

Problem type: F2 Decontextualization

Justification: same as p.5, 3.2

### 6.6.2 Analysis of Guideline for Prevention of Allergies, Germany

The second guideline from Germany that was subject to analysis was Guideline for Prevention of Allergies; registry no. 061-016. Several times on pages 3, 9, 14, 23, and 24 the term “breastfeeding period” was mentioned, but always relating to the nutrition of the mother during pregnancy and the lactation. Among others possible routes of exposure to allergens, those via the maternal cord and breast milk were under discussion. However, since this issue is not directly related to the research topic of the dissertation, it was not scrutinized for social determinants. The following table displays problem types that were detected in general, and then divided according to the respective social determinants.

**Table 24: Identified Problem Types and Social Determinants: Guideline for Prevention of Allergies; registry no. 061-016, Germany**

Problem type	Social Determinant	Frequency absolute	Frequency per social determinant
F1 Insensitivity to differences		9	
	Maternal age		2
	Maternal educational level		2
	SES		2
	Gender of infant		1
	Geographical location		2
F2 Decontextualization		4	
	One-parent family		1
	Employment status		1
	Social networks		1
F4 Assumed homogeneity		1	
	Maternal age/maternal educational level		1

## **P. 9, Ergebnisse**

### **„Stillen“**

**Stillen hat viele Vorteile für Mutter und Kind (1).**

***Die aktuelle Datenlage unterstützt die Empfehlung, dass für den Zeitraum der ersten 4 Monate voll gestillt werden soll. (A)***

In order for mothers to be able to fully breastfeed for four months, the following social determinants should be accounted for.

In order to support breastfeeding, the following social determinants need to be considered:

Social determinant: maternal age

Problem type: F1 Insensitivity to differences

Justification: Younger mothers tend to breastfeed less often and for a shorter breastfeeding period than older mothers. There was evidence for women aged 20 to 25, and an association between increasing age and frequency of breastfeeding.

Social determinant: maternal educational level

Problem type: F1 Insensitivity to differences

Justification: Women with a secondary educational and lower level had shorter breastfeeding rates compared to mothers with a high school degree and/or university degree.

Social determinant: SES

Problem type: F1 Insensitivity to differences

Justification: Starting to breastfeed as well as practicing exclusive breastfeeding is influenced by the socioeconomic position of a woman. The higher the SES of the family/mother, the more likely she was to breastfeed and the longer the exclusive breastfeeding period. There was evidence that social status exercised a stronger influence than other maternal characteristics implying that women with a low SES need special attention and support to establish breastfeeding successfully.

Social determinant: gender of infant

Problem type: F1 Insensitivity to differences

Justification: The breastfeeding period can vary according to the gender of the infant with male children less likely to be breastfed as long as female children.

Social determinant: geographical location

Problem type: F1 Insensitivity to differences

Justification: East German mothers tend to breastfeed more frequently, but for a shortened period. This was partly due to the need to return to work, but also accompanied by complaints that they could not produce sufficient breast milk. There was evidence that newborns received more supplementary feeding during their stay in hospitals located in the Eastern region, which is known to impair the physiology of lactation. Exclusive breastfeeding therefore needs to be emphasized.

Social determinants: maternal age, maternal educational level

Problem type: F4 assumed homogeneity

Justification: Young women with a low/lower educational level are especially vulnerable, since these two determinants have an effect that adds to each other resulting in even more reduced breastfeeding periods than those belonging to one group.

Social determinant: one-parent family

Problem type: F2 Decontextualization

Justification: Mothers living in one-parent families tend to breastfeed less often and for a shorter period of time. They require special attention and support.

Social determinant: employment status

Problem type: F2 Decontextualization

Justification: Women who are employed and have to resume work due to financial or other restraints prior to the end of maternity leave are much more likely to not breastfeed or to practice short term breastfeeding compared to those who take the entire period of maternal leave.

Social determinant: social networks

Problem type: F2 Decontextualization

Justification: the social network of a mother aside from her partner represented by other members of the family, friends and peers was considered as important for short term and long term breastfeeding success. They also have to be involved during breastfeeding counselling.

#### **P. 10 (Ergebnisse cont.)**

**„Muttermilchersatznahrung bei Risikokindern“**

***Wenn nicht oder nicht ausreichend gestillt wird, soll hydrolysierte Säuglingsnahrung bei Risikokindern gegeben werden. Die aktuelle Datenlage stützt diese Empfehlung für den Zeitraum der ersten 4 Lebensmonate. (A)***

No problem type detected.

#### **P. 13 Diskussion**

***Entsprechend gibt es Hinweise, dass längeres ausschließliches Stillen auch mit einer Risikoerhöhung für Allergien verbunden sein kann (Giwercman, Halkjaer et al. 2010, Pohlabein, Muhlenbruch et al. 2010).***

Social determinants: maternal age, maternal educational level, SES, geographical location

Problem type: F1 Insensitivity to differences

Justification: Women with an increased maternal age, increased maternal educational level, a higher social status and finally of West German descent are more likely to breastfeed exclusively for a longer period. Mothers belonging to these groups need to be aware of the possible risk associated with prolonged exclusive breastfeeding.

**Naturgemäß leiten sich Ergebnisse zum Stillen aus Beobachtungsstudien ab. Methodische Verzerrungen z. B. durch sog. reverse causality sollten hier kritisch beachtet werden. Zukünftig wird die elterliche Vorbelastung auch differenziert zu betrachten sein, zumal deutsche Untersuchungen darauf hindeuten, dass längeres Stillen das Allergierisiko des Kindes insbesondere dann erhöht, wenn die Mutter selbst von Allergien betroffen ist.**

***Die aktuelle Datenlage unterstützt allerdings weiterhin die Empfehlung, dass für den Zeitraum der ersten vier Monate voll – im Sinne der WHO-Definition von „predominant breastfeeding“ – gestillt werden soll. Zusätz-***

**lich wurde darauf hingewiesen, dass Stillen im Allgemeinen viele Vorteile für Mutter und Kind hat (Schack-Nielsen und Michaelsen 2007).**

Due to the format of the guideline, the recommendation for four months of breastfeeding is repeated with the only difference that in the first case (p. 9, Ergebnisse) it referred to exclusive breastfeeding, and in this one to predominant breastfeeding. It did not enter analysis.

#### **P. 24 Abbildung 2**

This figure is a summary of what has been presented in the guideline and visualizes the algorithm of primary prevention from allergic diseases, and was not subject to analysis.

**Algorithmus zur Primärprävention von Asthma, Heuschnupfen und atopischem Ekzem bei Risiko- und Nicht Risikopersonen**

**Familiäre Vorbelastung**

**(besteht, wenn mind. ein Elternteil und/ oder ein Geschwisterkind Asthma, Heuschnupfen oder Neurodermitis haben) nein - ja**

***Voll stillen in den ersten 4 Lebensmonaten***

**falls nicht möglich normale Säuglingsnahrung hypoallergene (HA) Nahrung (partiell oder extensiv hydrolysiert, keine soja-basierte Säuglingsnahrung)**

Due to the format of the guideline, the recommendation for four months of breastfeeding is repeated likewise under p. 9, Ergebnisse (not counted for analysis).

#### **6.6.3 Analysis of Clinical Guideline Postnatal Care, United Kingdom**

For the United Kingdom, the Clinical Guideline CG37 Postnatal Care was analyzed. Sections where breastfeeding was mentioned in relationship to pathophysiological concerns of maternal health (p. 11-19) and child health (p. 24-26) were not subject to analysis. Table 25 provides a detailed overview:

**Table 25: Identified Problem Types and Social Determinants: Clinical Guideline CG37 Postnatal Care, United Kingdom**

<b>Problem type</b>	<b>Social Determinant</b>	<b>Frequency absolute</b>	<b>Frequency per social determinant</b>
H2 Maintaining hierarchy	Maternal age; Maternal educational level; SES; one-parent family; ethnicity; social networks; culture; religion; workplace regulation; parental leave	20	2
F1 Insensitivity to differences		5	
	Maternal age		2
	Maternal educational level		1
	SES		1
	Ethnicity		1
F2 Decontextualization		4	
	Social networks		2
	Culture		1
	Parental leave		1
D2 Underrepresentation or Exclusion		10	
	Maternal age		1
	Maternal educational level		1
	SES		1
	One-parent family		3
	Ethnicity		1
	Social networks		2
	Culture		1

## **P. 11, Competencies**

**1.1.10 All healthcare professionals who care for mothers and babies should work with-in the relevant competencies developed by Skills for Health. Relevant healthcare professionals should also have demonstrated competency and sufficient ongoing clinical experience in:**

- **undertaking maternal and newborn physical examinations and recognizing abnormalities**
- ***supporting breastfeeding women including a sound understanding of the physiology of lactation and neonatal metabolic adaptation and the ability to communicate this to parents***
- **recognizing the risks, signs and symptoms of domestic abuse and whom to contact for advice and management, as recommended by Department of Health guidance [1], [2]**
- **recognizing the risks, signs and symptoms of child abuse and whom to contact for advice and management, as recommended by Department of Health guidance [1].**

Social determinant: maternal age, maternal educational level, SES, one-parent family, ethnicity, social networks, culture, religion, workplace regulation and parental leave

Problem type: H2 Maintaining hierarchy

Justification: The practice that health professionals should be basically competent in knowledge about the physiology of lactation and neonatal metabolic adaptation neglects the consideration of important social factors that influence breastfeeding and perpetuates the hierarchy of medically grounded knowledge over that of social determinants. In order to provide adequate breastfeeding support, both areas need to be integrated. Mothers that are affected by one or more of the social determinants should be supported in a way that enables them to start and sustain breastfeeding.

For the last part of the last sentence (***...and the ability to communicate this to parents***), the following problem type applies:

Social determinant: one-parent family, social networks

Problem type: D2 Under representation or exclusion

Justification: Mothers that lived as a one-parent family breastfeed less often and for shorter periods and require special attention. Members of the social network who tend to “co-decide” on the infant feeding decision should be involved to enable them to support breastfeeding.

**P. 20, 1.3.2**

***All healthcare providers (hospitals and community) should have a written breastfeeding policy that is communicated to all staff and parents. Each provider should identify a lead healthcare professional responsible for implementing this policy. [2006]***

Social determinant: one-parent family, social networks

Problem type: D2 Under representation or exclusion

Justification: same as p. 11, 1.1.10

**P. 20, 1.3.3**

***All maternity care providers (whether working in hospital or in primary care) should implement an externally evaluated, structured programme that encourages breastfeeding, using the Baby Friendly Initiative as a minimum standard. [2006]***

Social determinant: maternal age, maternal educational level, SES, one-parent family, ethnicity, social networks, culture, religion, workplace regulation and parental leave

Problem type: H2 Maintaining hierarchy

Justification: As outlined in the background chapter, the Baby Friendly (Hospital) Initiative is centered around management of breastfeeding and training of staff according to medical criteria. This reinforces the practice that programs implemented by maternity care providers for breastfeeding support do not integrate socially grounded factors known to be influential on breastfeeding. For an adequate breastfeeding support, both perspectives need to be integrated. The justification/rationale for the respective social determinants was already provided under p. 11, 1.1.10 and will therefore not be repeated.

**P. 20, 1.3.4**

***Healthcare professionals should have sufficient time, as a priority, to give support to a woman and baby during initiation and continuation of breast-feeding. [2006]***

Social determinant: maternal age

Problem type: F1 Insensitivity to differences

Justification: Adolescent mothers require five types of support in regards to breastfeeding. Healthcare professionals need to be aware of the special needs and make sure that they allocate extra time to promote breastfeeding appropriately.

**P. 20, 1.3.5**

**Where postnatal care is provided in hospital, attention should be paid to facilitating an environment conducive to breastfeeding. This includes making arrangements for:**

- **24-hour rooming-in and continuing skin-to-skin contact when possible**
- **privacy**
- **adequate rest for women without interruption caused by hospital routine**
- **access to food and drink on demand. [2006]**

No problem type detected.

**P. 20, 1.3.6**

**Formula milk should not be given to breastfed babies unless medically indicated. [2006]**

There are no data from the studies analyzed for the United Kingdom about supplementary feeding in health services.

**P. 21, 1.3.7**

**Commercial packs, for example those given to women when they are discharged from hospital, containing formula milk or advertisements for formula should not be distributed. [2006]**

Although the marketing of infant formula products is counterproductive to breastfeeding, it was not at the core of this research and was therefore not investigated further.

**P. 21, 1.3.8**

**Women who leave hospital soon after birth should be reassured that this should not impact on breastfeeding duration. [2006]**

Social determinant: Maternal age, maternal educational level, SES, ethnicity

Problem type: F1 Insensitivity to differences

Justification: Young maternal age, low maternal educational level, low SES and White British ethnicity can all impact negatively on breastfeeding duration. Women that belong to one of these groups are therefore at higher risk to not sustain breastfeeding and thus require adequate support.

Social determinant: social networks

Problem type: F2 De-contextualization

Justification: Members of the social network of the breastfeeding mother exercise a strong influence on the mother in regards to sustaining of breastfeeding. They should therefore be involved to get informed and to prepare for support.

Social determinant: culture, parental leave

Problem type: F2 De-contextualization

Justification: Feeding an infant with formula has become the social norm and influences women in their decision to start as well as continue breastfeeding. Aside of that, the point in time when she has to resume work/end of her maternal leave also determines breastfeeding duration.

**P. 21, 1.3.9**

**Written breastfeeding education materials as a stand-alone intervention are not recommended. [2006]**

No problem type detected.

**P. 21, 1.3.10**

***In the first 24 hours after birth, women should be given information on the benefits of breastfeeding, the benefits of colostrum and the timing of the first breastfeed.***

Social determinant: social networks

Problem type: F2 De-contextualization

Justification: Members of the social networks, mainly the own mother and the father of the child are known to be very influential on the decision on the infant feeding method. They should therefore also be given the information.

***Support should be culturally appropriate. [2006]***

Social determinant: maternal age, maternal educational level, SES, one-parent family, ethnicity, culture

Problem type: D2 Under representation or exclusion

Justification: Young age, a low maternal educational level, a low SES, status as a one-parent family, and White British ethnicity are social determinants that influence the uptake of breastfeeding negatively. Aside of that, the social norm to breastfeed was replaced by formula feeding, and is therefore not “culturally appropriate” anymore in British society. Therefore, the concept of being (culturally) appropriate has to be defined along these determinants.

**P. 21, 1.3.11**

***Initiation of breastfeeding should be encouraged as soon as possible after the birth, ideally within 1 hour. [2006]***

From the studies analyzed, there were no data available regarding onset of breastfeeding.

**P. 21, 1.3.12 and 1.3.13**

No mentioning of breastfeeding.

**P. 21, 1.3.14**

***It is not recommended that women are asked about their proposed method of feeding until after the first skin-to-skin contact. [2006]***

This recommendation falls in the same analysis category as in p.21, 1.3.10 and will therefore not be repeated.

**1.3.15 and 1.3.16**

Statements on practical information/instrumental advice on breastfeeding (positioning, breastfeeding after anesthesia) provided and therefore not subject to analysis.

**Continuing successful breastfeeding**

**1.3.17 to 1.3.22**

Statements on practical information/instrumental advice on breastfeeding (positioning, breastfeeding after anesthesia) provided and therefore not subject to analysis.

**Assessing successful breastfeeding**

**P. 23, 1.3.23**

***A woman's experience with breastfeeding should be discussed at each contact to assess if she is on course to breastfeed effectively and identify any need for additional support. Breastfeeding progress should then be assessed and documented in the postnatal care plan at each contact.***

**[2006]**

No problem type detected.

**P. 23, 1.3.24 to 1.3.26**

Practical information/instrumental advice on breastfeeding provided.

**P. 23, 1.3.27 to 1.3.41**

Practical information/instrumental advice on breastfeeding provided.

**6.6.4 Analysis of Public Health Guideline 11, Maternal and Child Nutrition, United Kingdom**

The second guideline from the United Kingdom to be analyzed was the NICE Public Health Guidance 11.

Above follows the outline on problem types identified and related social determinants.

**Table 26: Identified Problem Types and Social Determinants: Public Health Guideline 11, Maternal and Child Nutrition**

<b>Problem type</b>	<b>Social Determinant</b>	<b>Frequency absolute</b>	<b>Frequency per social determinant</b>
H2 Maintaining hierarchy	Maternal age; Maternal educational level; SES; one-parent family; ethnicity; social networks; culture; religion; workplace regulation; parental leave	70	7
F2 De-contextualization		3	
	Culture		1
	Workplace regulation		1
	Parental leave		1
D2 Underrepresentation or Exclusion		4	
	One-parent family		2
	Ethnicity		2

## **P. 34, Breastfeeding**

### **Recommendation 7**

- **Adopt a multifaceted approach or a coordinated programme of interventions across different settings to increase breastfeeding rates. It should include:**
  - ***activities to raise awareness of the benefits of – and how to over-come the barriers to***
    - ***breastfeeding***

Social determinant: culture

Problem type: F2 De-contextualization

Justification: Due to the fact that the norm of infant feeding has changed to formula feeding, breastfeeding in public was identified as one of the main barriers to start and to continue breastfeeding. Activities directed at raising awareness need to take these major obstacles into consideration.

Social determinant: workplace regulation, parental leave

Problem type: F2 De-contextualization

Justification: The duration of parental leave is not necessarily in line with the recommended period of six months to breastfeed exclusively, and might “voluntarily” be shorter because women fear to lose their jobs or experience economic constraints. Mothers would therefore need an appropriate place at their worksite where they can either breastfeed or express and store milk. This other major obstacle has to be considered to overcome barriers to breastfeeding.

- **training for health professionals**
- **breastfeeding peer-support programs**
- **joint working between health professionals and peer supporters**

No problem type detected.

- ***education and information for pregnant women on how to breast-feed, followed by proactive support during the postnatal period (the support may be provided by a volunteer***

Social determinant: maternal age, maternal educational level, SES, one-parent family, ethnicity, social networks, culture, religion, workplace regulation, parental leave

Problem type: H2 Maintaining hierarchy

Justification: The focus on how to breastfeed reinforces the hierarchy of technical, medically oriented knowledge over other influences determining breastfeeding. A focus on aspects limited to managing/technical details of breastfeeding (“how to breastfeed”) is not sufficient. Health professionals and volunteers that provide breastfeeding support need to be aware and trained on the possible influences of the social determinants on breastfeeding.

- ***Implement a structured program that encourages breastfeeding, using BFI as a minimum standard. The program should be subject to external evaluation.***

Social determinant: maternal age, maternal educational level, SES, one-parent family, ethnicity, social networks, culture, religion, workplace regulation, parental leave

Problem type: H2 Maintaining hierarchy

Justification: same as p.34, Recommendation 7, - education and information for pregnant women on how to breastfeed, followed by proactive support during the postnatal period (the support may be provided by a volunteer)

- **Ensure there is a written, audited and well-publicized breastfeeding policy that includes training for staff and support for those staff who may be breast-feeding. Identify a health professional responsible for implementing this policy.**

No problem type detected.

### **P. 35, Recommendation 8**

**Who is the target population?**

**Pregnant women and breastfeeding mothers.**

No problem type detected.

### **Who should take action?**

**Commissioners and managers of maternity and children's services.**

**PCTs.**

No mentioning of breastfeeding.

### **What action should they take?**

- **Ensure health professionals who provide information and advice to breastfeeding mothers have the required knowledge and skills.**
- ***Ensure support workers receive training in breastfeeding management from someone with the relevant skills and experience before they start working with breastfeeding mothers.***

Social determinant: maternal age, maternal educational level, SES, one-parent family, ethnicity, social networks, culture, religion, workplace regulation, parental leave

Problem type: H2 Maintaining hierarchy

Justification: same as p.34, Recommendation 7, - education and information for pregnant women on how to breastfeed, followed by proactive support during the postnatal period (the support may be provided by a volunteer)

**Ensure all those who work in maternity and children's services, including receptionists, volunteers and ancillary staff, are made fully aware of the importance of breastfeeding and help to promote a supportive environment.**

No problem type detected.

### **P. 36, Recommendation 9**

**Target population: pregnant women and their partners.**

### **Who should take action?**

**Midwives, obstetricians, GPs and health visitors.**

### **What action should they take?**

- **Midwives and health visitors should ensure pregnant women and their partners are offered breastfeeding information, education and support on an individual or group basis. *This should be provided by***

**someone trained in breastfeeding management and should be delivered in a setting and style that best meets the woman's needs.**

Social determinant: maternal age, maternal educational level, SES, one-parent family, ethnicity, social networks, culture, religion, workplace regulation, parental leave

Problem type: H2 Maintaining hierarchy

Justification: same as p.34, Recommendation 7, - education and information for pregnant women on how to breastfeed, followed by proactive support during the postnatal period (the support may be provided by a volunteer)

**During individual antenatal consultations GPs, obstetricians and midwives should encourage breastfeeding. They should pay particular attention to the needs of women who are least likely to breastfeed (for example, young women, those who have low educational achievement and those from disadvantaged groups).**

Social determinant: one-parent family, ethnicity

Problem type: D2 Under representation or exclusion

Justification: Mothers of White British ethnicity belong to those who are least likely to breastfeed and need to be addressed as well. Mothers living as one-parent families were much more likely to not breastfeed compared to cohabitating mothers.

- **A midwife or health visitor trained in breastfeeding management should provide an informal group session in the last trimester of pregnancy.**

Social determinant: maternal age, maternal educational level, SES, one-parent family, ethnicity, social networks, culture, religion, workplace regulation, parental leave

Problem type: H2 Maintaining hierarchy

Justification: same as p.34, Recommendation 7, - education and information for pregnant women on how to breastfeed, followed by proactive support during the postnatal period (the support may be provided by a volunteer)

- ***This should focus on how to breastfeed effectively by covering feeding position and how to attach the baby correctly.***

Social determinant: maternal age, maternal educational level, SES, one-parent family, ethnicity, social networks, culture, religion, workplace regulation, parental leave

Problem type: H2 Maintaining hierarchy

Justification: same as p.34, Recommendation 7, - education and information for pregnant women on how to breastfeed, followed by proactive support during the postnatal period (the support may be provided by a volunteer)

### **P. 36, Recommendation 10**

**Who is the target population?**

**Breastfeeding mothers.**

**Who should take action?**

**Midwives, health visitors, midwifery and health visitor support workers.**

**What action should they take?**

- ***Ensure a mother can demonstrate how to position and attach the baby to the breast and can identify signs that the baby is feeding well. This should be achieved (and be documented) before she leaves hospital or the birth center (or before the midwife leaves the mother after a home birth).***

Social determinant: maternal age, maternal educational level, SES, one-parent family, ethnicity, social networks, culture, religion, workplace regulation, parental leave

Problem type: H2 Maintaining hierarchy

Justification: same as p.34, Recommendation 7, - education and information for pregnant women on how to breastfeed, followed by proactive support during the postnatal period (the support may be provided by a volunteer)

- **Provide continuing and proactive breastfeeding support at home, recording all advice in the mother's hand-held records.**
- **Provide contact details for local voluntary organisations that can offer ongoing support to complement NHS breastfeeding services.**

- Advise mothers that a healthy diet is important for everyone and that they do not need to modify their diet to breastfeed.
- Do not provide written materials in isolation but use them to reinforce face-to-face advice about breastfeeding.

No problem type detected.

### **P. 36, Recommendation 11**

**Who is the target population?**

**Pregnant women and new mothers, particularly those who are least likely to start and continue to breastfeed. *For example, young women, those who have low educational achievement and those from disadvantaged groups.***

Social determinant: ethnicity, one-parent family

Problem type: D2 Under representation or exclusion

Justification: same as p. 36, Recommendation 9

**Who should take action?**

**Commissioners and managers of maternity and children's services.**

**What action should they take?**

**Provide local, easily accessible breastfeeding peer support programs and ensure peer supporters are part of a multidisciplinary team.**

- **Ensure peer supporters:**
  - attend a recognized, externally accredited training course in breastfeeding peer support
  - contact new mothers directly within 48 hours of their transfer home (or within 48 hours of a home birth)
  - offer mothers ongoing support according to their individual needs. This could be delivered face-to-face, via telephone or through local groups
  - can consult a health professional and are provided with ongoing support
  - gain appropriate child protection clearance.

No problem type detected.

- **Consider training peer supporters and link workers to help mothers, parents and care takers follow professional advice on feeding infants aged 6 months and over. The advice should promote an increasingly varied diet using food of different textures in appropriate amounts (in addition to milk), in response to the baby's needs.**

No problem type detected.

**P. 38, Recommendation 12**

Practical/technical advice about extraction and storage of breast milk

**6.6.5 Analysis of Under Five’s Child Health Policy**

For Ghana, the Under Five’s Child Health Policy was subject to analysis. Chapter 5 on technical interventions along the continuum of care was the part analyzed.

The following table summarizes the results:

**Table 27: Identified Problem Types and Social Determinants: Under Five’s Child Health Policy, Ghana**

<b>Problem type</b>	<b>Social Determinant</b>	<b>Frequency absolute</b>	<b>Frequency per social determinant</b>
H2 Maintaining hierarchy	Maternal age; maternal educational level; wealth index/SES; employment status; social networks; gender of infant; working conditions; culture; religion; workplace regulation	10	1
F1 Insensitivity to differences		4	
	Maternal age		1
	Maternal educational level		1
	Wealth index/SES		1
	Gender of infant		1
F2 De-		8	

Problem type	Social Determinant	Frequency absolute	Frequency per social determinant
contextualization			
	Employment status		1
	Social networks		3
	Working conditions		1
	Culture		1
	Religion		1
	Workplace regulation		1

### **P. 8, 5.1**

No mentioning of breastfeeding.

### **P. 9, 5.2**

No mentioning of breastfeeding. The immediate post-delivery period is defined as the first hour after birth.

#### **P. 9, 5.2.1 Interventions that will be implemented for delivery and the immediate post-delivery period are:**

- **Monitoring progress of labor, maternal and fetal well-being with partograph;**
- **Detection and management of problems and complications (e.g. malpresentations, prolonged/obstructed labor, hypertension, bleeding, infection);**
- **Emergency obstetric and neonatal care for complications;**
- **Immediate newborn care (resuscitation if required, thermal care, hygienic cord and eye care, *early initiation of breastfeeding and exclusive breastfeeding*);**

In Ghana, early initiation of breastfeeding is essential for newborn survival.

Social determinant: maternal age

Problem type: F1 Insensitivity to differences

Justification: Generally, delivery assistants have a strong influence on when mothers start breastfeeding. In health services, health staff insists on early onset of breastfeeding as required in the policy under analysis. However, in a home birth early onset of breastfeeding can be substantially delayed in young mothers. This is especially true for young mothers having their first child, who are expected to follow advice from family members/delivery staff. Home birth attendants and family members should be aware of the importance of current breastfeeding recommendations.

Social determinant: gender of infant

Problem type: F1 Insensitivity to differences

Justification: In areas where traditions in regards to childbirth and breastfeeding are followed, onset of breastfeeding is delayed in first-time mothers according to the gender of the infant, for boys, a period of three and for girls of four days.

Social determinant: culture

Problem type: F2 De-contextualization

Justification: In areas where tradition still played a major role, the colostrum of the first-time mother is subject to a ritual leading to a delay or possibly the non-feeding of the colostrum.

Social determinant: religion

Problem type: F2 De-contextualization

Justification: Religious families tend to choose a birth setting outside health services. It is common practice among animist families that a spiritual leader has to consult the Gods before a baby is breastfed. In any case, the newborn is not to receive colostrum on the day of birth incurring a substantial delay for the first feed.

Social determinant: social networks

Problem type: F2 De-contextualization

Justification: Though community members like grandmothers are knowledgeable on the importance of early onset of breastfeeding and that the newborn receives the colostrum, mothers are challenged by conflicting advice of delivery assistants and members of the community, mainly when delivering outside the clinical setting.

- PMTCT of HIV;
- Post-partum vitamin A.

Packages that will be implemented for delivery and post-delivery interventions shall be:

- Skilled birth care
- Emergency obstetric and newborn care (EmONC)

No mentioning of breastfeeding.

**P. 9, 5.2 to P. 10, 5.2.7**

No mentioning of breastfeeding.

**P. 10, 5.2.8.**

**Essential newborn care tasks in the immediate post-delivery period include prevention and management of hemorrhage, thermal care, cord care, *early initiation of breastfeeding*, eye care and recognition of when to refer.**

Repetition of p. 9, 5.2.1 (not subject to analysis)

**Low birth weight babies (LBW) shall be managed with Kangaroo Mother Care (KMC). All personnel who have contact in the immediate post-delivery period shall be trained in key tasks. Pre-delivery education of mothers and other family members will review immediate post-delivery tasks. Since post-delivery tasks generally require minimal special knowledge or skills, they can be promoted and reinforced by family members, and community groups and volunteers. Community health education should emphasize key post-delivery practices.**

No mentioning of breastfeeding.

**P. 10, 5.2.9**

No mentioning of breastfeeding

**P. 10, 5.3.**

**The neonatal period is defined as the period between birth and 28 days of life.**

No mentioning of breastfeeding

**P. 11, 5.3.1. Interventions that will be delivered during the neonatal period**

**are:**

• ***Exclusive breastfeeding;***

Social determinant: social networks

Problem type: F2 De-contextualization

Justification: Members from the social networks of women, especially grandmothers, are decision-makers as to the infant feeding method of their grandchild. Since in that generation the feeding of water alongside with breastfeeding or mixed feeding was common practice, they tend to continue with it. Another important person is the father of the child. If he supports exclusive breastfeeding, mothers are twice as likely to do so. Besides, if a mother returned home breastfeeding exclusively, the chance is high that it this practice will be respected by members the social network.

• **Thermal care (including kangaroo mother care);**

• **Hygienic cord care;**

• **Prompt care-seeking for illness;**

• **Management of the sick newborn (including sepsis, asphyxia, and prematurity);**

• **PMTCT of HIV**

• **Immunizations**

• **Screening for sickle cell anemia**

**Packages that will be implemented to deliver neonatal interventions are:**

• **Postnatal care (PNC)**

• **IMNCI - management of sick newborn**

• **Promotion of key household and community practices.**

No mentioning of breastfeeding

**P. 11, 5.3.2. to 5.3.5**

No mentioning of breastfeeding.

**P. 12, 5.3.6 to 5.3.12**

No mentioning of breastfeeding

**P. 12, 5.4. Infants and children**

**Children include all infants and older children between 1 and 59 months of age.**

**5.4.1. Interventions that will be delivered to infants and children include:**

**PREVENTIVE:**

**• *Exclusive BF to 6 months; ITNs***

Mothers who are influenced by the following social determinants are less likely to breastfeed exclusively and require special attention and support.

Social determinant: maternal educational level

Problem type: F1 Insensitivity to differences

Justification: Mothers with an educational level lower or higher than secondary are less likely to breastfeed exclusively for a longer period.

Social determinant: wealth index/SES

Problem type: F1 Insensitivity to differences

Justification: Women that own their own house are four times more likely to breastfeed exclusively compared to those that are renting a place. Regarding the income level, the higher it is for health workers, the more likely they are to not breastfeed exclusively. This is most likely caused by the fact that they might hold a managerial position and dispose over less job flexibility.

Social determinant: employment status

Problem type: F2 De-contextualization

Justification: Full-time work status was the main barrier to exclusive breastfeeding for six months.

Social determinant: social networks

Problem type: F2 De-contextualization

Justification: same as p. 11, 5.3.1

Social determinant: working conditions

Problem type: F2 De-contextualization

Justification: Although mothers are aware of the importance of exclusive breastfeeding for their child, they could not practice it at their workplace due to elevated stress levels. This is true for a wide variety of work areas. Health professionals

face an additional challenge due to the fact that their schedule (shift work) was not compatible with breastfeeding. Moreover, colleagues do not comply if they want to leave their workplace earlier.

Social determinant: workplace regulation

Problem type: F2 De-contextualization

Justification: Though mothers that practice exclusive breastfeeding are entitled to a one-hour breastfeeding break and family members would be willing to bring the child to the workplace, no adequate place is provided by the employer.

Women that work in informal employments like markets also complain about not disposing over an appropriate place to breastfeed, especially when they have no kiosk of their own.

- ***Continued breastfeeding to 2 years and beyond; ITNs***

There are no data available on social determinants and their influence on the breastfeeding period of two years.

- ***Appropriate complementary feeding from 6 months; ITNs***

- ***Appropriate feeding of infants of HIV+ mothers;***

- ***Use of ITNs s; ITNs***

- ***Complete vaccination by 12 months of age (polio, diphtheria, pertussis, tetanus, Hib, hepatitis B, measles, yellow fever and new vaccines as per EPI policy)***

**P. 13, 5.4.1. continued**

No mentioning of breastfeeding

**P. 13, 5.4.2. Nutrition**

**5.4.2.1. Breastfeeding**

***Exclusive breastfeeding will be promoted from birth to 6 months (children less than 180 days)***

Same recommendation as p.12, 5.4.1 (not counted)

***Exclusive breastfeeding means that the infant is breastfed and given no other solids or liquids, including water (drops of vitamins, minerals or medicines, are allowed, when medically indicated).***

No problem type detected.

This policy is in line with the National Breastfeeding Policy 17 and recognizes the 'International Code of Marketing of Breast Milk Substitutes'. Policies on breastfeeding and the use and promotion of breast milk substitutes are outlined in the National Breastfeeding Policy and 'Breastfeeding Promotion Regulations, Legislative Instrument 1667', enacted by Parliament in May 2000. The child health program will support and encourage monitoring of this legislation in collaboration with the Food and Drugs Board.

No problem type detected.

***All mothers shall be supported to provide appropriate feeding of their infants.***

No problem type detected.

Health facilities with maternity services shall be encouraged to be accredited as 'Baby Friendly' and monitored to retain their status.

#### **P. 14, 5.4.2.2. Complementary feeding**

Complementary feeding shall begin at 6 months of age.

Complementary foods should be of an appropriate: a) quality (energy density, micronutrient composition, food handling); b) quantity; c) frequency. Use of locally available, affordable and acceptable complementary foods will be promoted. ***In addition to complementary feeding, breastfeeding should continue until 2 years of age and beyond.***

There are no data available on social determinants and their influence on the breastfeeding period of two years.

#### **P. 14, 5.4.2.3. to 5.4.2.8**

No mentioning of breastfeeding

#### **P. 15, 5.4.2.9. Baby Friendly Hospitals**

***Accredited 'Baby Friendly' hospitals shall be established to promote early and exclusive breastfeeding. The WHO and UNICEF criteria for determining whether facilities are 'Baby-Friendly' shall be used. Local accreditation shall be carried out by a team that visit each site. As facilities can change***

**over time, accredited sites shall be required to be ‘re-accredited’ (designated) every two years.**

Social determinant: maternal age, maternal educational level, wealth index/SES, employment status, gender of infant, social networks, working conditions, culture, religion, workplace regulation

Problem type: H2 maintaining a hierarchy

Justification: As outlined in the background chapter and during analysis of both guidelines from the United Kingdom, criteria for accrediting ‘Baby Friendly’ hospitals are based on technical issues of breastfeeding management and training of staff on the physiology of lactation. The hierarchy of medical knowledge over socially grounded factors known to be influential on breastfeeding is therefore reinforced.

#### **5.4.2.10.**

No mention of breastfeeding

#### **5.4.2.11. Standards and guidelines**

**Standards and guidelines for growth monitoring and promotion, breastfeeding and complementary feeding practices, supplementation with vitamin A, iodine and other micronutrients and management of severe malnutrition, are described in detail in the National Nutrition Policy Guidelines.<sup>20</sup>**

No problem type detected. The National Nutrition Policy Guidelines covers complementary feeding practice to prevent malnutrition in children. Since breastfeeding is not covered, it was not subject to analysis.

#### **p. 15, 5.4.3. to 5.4.4**

Not applicable

### 6.6.6 Analysis of National Guideline on Prevention from Mother To Child Transmission of HIV

The second guideline, the National Guideline on Prevention to Mother to Child Transmission of HIV that was scrutinized was the one that relates to a disease through breastfeeding and at the same time, provides an essential protection against other infectious diseases. That makes the contribution to a successful lactation essential. Chapter 11, Care of the HIV infected women, women of unknown status and the newborn after delivery was therefore analyzed. As elaborated in chapters 2.5 and 2.6, it is essential to establish and maintain exclusive breastfeeding, otherwise the risk to transmit HIV is increased. Table 28 provides a summary of detected problem types and social determinants. For this guideline, the recommendation to breastfeed exclusively is issued for different time periods and was therefore always counted.

**Table 28: Identified Problem Types and Social Determinants: National Guideline for Prevention of Mother to Child Transmission of HIV**

Problem type	Social Determinant	Frequency absolute	Frequency per social determinant
F1 Insensitivity to differences		2	
	Gender of infant		2
F2 Decontextualization		19	
	Employment status		2
	Social networks		9
	Working conditions		2
	Culture		2
	Religion		2
	Workplace regulation		2

**P. 13, 10. CARE FOR HIV INFECTED WOMEN AND WOMEN OF UNKNOWN STATUS**

No mentioning of breastfeeding

**10.1 During Pregnancy**

No mentioning of breastfeeding

**P. 14, 10.1 During Pregnancy (continued)**

- **Nutritional support**
  - **Counselling and support on infant feeding choices.**
  - ***A woman who is HIV-positive shall be supported to make an informed decision between breastfeeding and replacement feeding.***
  - **Initiation of micronutrient supplementation for the mother (vitamin, folic acid and iron).**

Social determinant: social networks

Problem type: F2 De-contextualization

Justification: In the home environment, members of the social networks like the grandmother and/or the father of the child most likely influence the way the infant is fed. Those who participate in the decision on how the infant is fed need to be involved during counselling on infant feeding choices and how to support the breastfeeding mother.

**10.2 During Labor and Delivery**

No mentioning of breastfeeding

**P. 15, 11.1 Post-partum Care for Mother**

No mentioning of breastfeeding

**P. 15, 11.2 Newborn Care**

- **Standard care of the newborn**
- ***Initiate infant feeding choice***
- **Initiate ARV prophylaxis in infants of HIV positive mothers**
- **Immunization (BCG and OPV)**

Social determinant: gender of infant

Problem type: F1 Insensitivity to Differences

Justification: In rural areas initiation of breastfeeding can start at a different point in time for boys and girls in first-time mothers. A delay of three and four days respectively can occur. Newborns are fed either on the basis of herbal tea or by a wet nurse, thus a new route of exposure to HIV is introduced by the latter.

Social determinant: social networks

Problem type: F2 De-contextualization

Justification: same as p. 14, 10.1

Social determinants: culture, religion

Problem type: F2 De-contextualization

Justification: Newborns are fed either on the basis of herbal tea or by a wet nurse, thus a new route of exposure to HIV is introduced by the latter. Aside of that, there are rituals practiced in the Northern culture for first-time mothers that impair early onset because of beliefs that the colostrum itself is not good for the baby. In case of families that adhere to traditional religion, a delay of early onset can also occur.

### **P. 15, 11.3 At Discharge**

**The mother and baby shall be followed up after delivery to ensure continuity of care started in the antenatal period. As much as possible appointments for mother and baby shall be synchronized.**

No mentioning of breastfeeding

### **P. 16, 11.3**

#### **Checklist for Discharge**

- ***Give counselling and support on method of infant feeding chosen by mother (see below) and on maternal nutrition including micronutrient supplementation.***

No problem type detected.

- **General physical examination of infant to exclude abnormalities**
- **Supply drugs and explain dosage and duration of ARV prophylaxis for baby and ARV prophylaxis or treatment for mother as applicable.**
- **OI prophylaxis for mother**
- **Educate on recognition of ill health in mother and newborn and appropriate actions to be taken<sup>1</sup>**
- **Advice and support on preventive measures such as hygienic practices, malaria prevention**
- **Ensure BCG/OPV immunization for infant has been given**
- **Record infant weight, length and head circumference in Child Health Record**
- **Psychosocial /Community support**
- **Give 3 days' appointment for Post-natal clinic**

No problem type detected.

**P. 16, 11.4 Post-natal clinic**

No mentioning of breastfeeding.

**Day 3 Visit**

Mother

No mentioning of breastfeeding

Newborn

- **History and physical exam including assessment for pallor, jaundice, weight, length, head circumference. Refer for clinical care if indicated.**
- ***Assess adherence to feeding choice, provide counseling and support (see below)***

Social determinant: social networks

Problem type: F2 De-contextualization

Justification: same as p. 14, 10.1

**P. 17, 11.4 Post-natal clinic (continued)**

- **BCG/OPV if not already given**
- **Assess adherence to ARV prophylaxis and ensure adequate supply for those on 6 weeks' regimen**
- **Educate on recognition of ill health in newborn and appropriate actions to be taken**
- **Give 6 weeks' appointment for Reproductive and Child Health (RCH)/Child Welfare clinic**
- **Where mother is not available to be offered counselling and testing, a serological shall be done on the baby to establish whether the baby is HIV exposed or not.**

No problem type detected.

**6-week visit**

**Mother**

No mentioning of breastfeeding

**Infant**

- **History and physical exam including assessment for pallor, jaundice, weight, length, head circumference and development. Refer for clinical care if indicated.**
- ***Assess adherence to feeding choice, provide counseling and support (see below)***

Social determinant: social networks

Problem type: F2 De-contextualization

Justification: same as p. 14, 10.1

- **Pentavalent/OPV immunization**
- **Assess adherence to ARV prophylaxis for those put on 6-week regimen and stop prophylaxis**
- **Start Co-trimoxazole prophylaxis once daily for all HIV exposed babies from six weeks onwards**

- **Determine HIV status by testing where available at age 6 weeks. This shall be deferred to 10 to 12 weeks for babies who were on ARV prophylaxis.**
- **Refer to ART Clinic HIV care (to attend for 1st visit in one month i.e. age 10 week)**

**P. 17, RCH/Child Welfare Clinic**

**Schedule monthly follow-up sessions, whenever the mother brings the child to the clinic for well-baby check-ups and immunizations. Additional sessions may be required during special high-risk periods, such as when the:**

- **Child is sick**
- ***Mother returns to work***

Social determinants: employment status, working conditions, workplace regulation

Problem type: F2 De-contextualization

Justification: Full-time employed mothers face big challenges to continue exclusive breastfeeding. Since their children belong to a highly vulnerable group, they require support through the provision of appropriate place to breastfeed or to express and store breastfeeding in both formal and informal workplace setting. Also, it is essential for them to take the breastfeeding break they are entitled to. This is aggravated for mothers who do shift work.

- ***Mother decides to change feeding methods***

Social determinant: social networks

Problem type: F2 De-contextualization

Justification: in the home environment, members of the social networks like the grandmother and/or the father of the child most likely influence the way the infant is fed. Thus the social network needs to be involved when a change in the infant feeding method is planned.

## **P. 17, 18 ART Clinic**

### **Infant**

Duration of follow up depends on when HIV infection status is determined and on feeding method. At each visit the following activities should take place:

- Assess and consider need for ART in all HIV infected infants. (See guidelines for initiation of ART.)
- History and physical exam including assessment for pallor, weight, length, head circumference, development and features of HIV associated illnesses.
- Virologic test
- *Counselling and support on feeding (see below)*
- Immunizations according to national schedule but symptomatic infants should not be given yellow fever immunization.
- Continue Co-trimoxazole prophylaxis once daily in all infants and stop in those whose HIV infection status is shown to be negative.
- Early and aggressive treatment of opportunistic infections (OIs).
- Nutrition intervention
- Vitamin A supplementation
- Regular 6 monthly de-worming

No problem type detected.

## **P. 18, 11.5 Infant Feeding Options**

***Mothers who are HIV-positive shall receive infant feeding counseling over the course of several sessions. At least three counseling sessions shall take place during the antenatal period.***

No problem type detected.

**If possible, do this sometime after post-test counseling, but not immediately after the mother learns her test results. *The mother shall be counselled and supported to make an informed infant feeding choice during this period***

Social determinant: social networks

Problem type: F2 De-contextualization

Justification: same as p. 14, 10.1

**More than one session is ideal. *The mother and newborn shall be seen immediately after birth and scheduled for appointment 3 days later to monitor postpartum and infant feeding progress.***

No problem type detected.

**Mothers with HIV infection shall be guided in their decision-making process by providing infant-feeding counselling that includes the following:**

**Information about the risk of HIV transmission through breastfeeding**

**Advantages and disadvantages of each available option**

***Respect for local customs, practices, and beliefs when helping a mother make infant-feeding choices***

Social determinant: gender of infant

Problem type: F1 Insensitivity to Differences

Justification: same as p. 14, 10.1

Social determinant: culture, religion

Problem type: F2 De-contextualization

Justification: As outlined before, a delay in onset of breastfeeding cultural and/or religious aspects can occur in rural/traditional areas. Depending on how the child is fed, it might have problems to latch correctly at the mother's breast, thus cause cracked teats and increase the risk for HIV transmission. The nutrition of an infant through a wet nurse can also be a risk factor. Therefore, respect for local customs, and beliefs are important, but have to be considered in the view of protecting the child.

Social determinant: social networks

Problem type: F2 De-contextualization

Justification: same as p. 14, 10.1

## **P. 19**

**The options available are:**

### **1. Breastmilk Feeding Options**

#### **a. *Exclusive Breastfeeding for six months***

In order to enable the mother to breastfeed successfully for a period of six months, the following social determinants need to be taken into account:

Social determinant: social networks

Problem type: F2 De-contextualization

Justification: same as p. 14, 10.1

Social determinants: employment status, working conditions and workplace regulation

Problem type: F2 De-contextualization

Justification: women in employment, especially full-time are not able to continue breastfeeding, as well as those in shift work and with poor cooperation from their colleagues' side. Aside of that, appropriate places for breastfeeding at work are often not provided neither in a formal nor informal workplace setting.

#### **b. *Exclusive Breastfeeding with early cessation***

Social determinant: social networks

Problem type: F2 De-contextualization

Justification: same as p. 14, 10.1

#### **c. *Heat-treated Breastmilk***

Social determinant: social networks

Problem type: F2 De-contextualization

Justification: same as p. 14, 10.1

**When mother decides to stop breastfeeding she shall be supported to completely cease breastfeeding the infant within two weeks. The risk of mixed feeding would be minimized by introducing cup feeding with expressed breastmilk 2 to 4 weeks before complete cessation of breastfeeding.**

## **2. Replacement Feeding Option**

### **a. Commercial Infant Formula**

### **b. Home Modified Animal Milk**

**The Replacement Feeding Option shall only be considered when it is Acceptable, Feasible, Affordable, Sustainable and Safe (AFASS). Micronutrient supplementation shall be given to infants on replacement feeding.**

**Note: Mixed feeding should always be avoided.**

No problem type detected.

### **P. 20 – 26**

No mentioning of breastfeeding.

## **7 Discussion**

In this part of the thesis, the results stated in chapter 6 are discussed and contrasted with the current state of research. The main idea of this research was to understand how social determinants affect breastfeeding in which way and in what kind of circumstances. The second aim was to find out in how far these social determinants are addressed in breastfeeding-related guidelines. The chapter therefore starts with a discussion of the content-related findings from the Realist Review, the data extraction as well as Realist Synthesis, guideline analyses and finally by the methodological approach.

### **7.1 Content-Related Discussion**

First, findings from the Realist Review are presented, starting with the studies that were identified and then findings from the analyses relevant for all three countries. Thereafter, main results from the Realist Synthesis and social bias analysis are outlined according to each country that was researched. As a next step, results from guideline analyses in regards to whether and how far the breastfeeding continuum is represented in the breastfeeding-related guidelines are portrayed. Finally, the model that was initially at the core of the research has been further developed based on the findings from the three countries is presented at the end.

#### **7.1.1 Comparison of Findings from the Realist Reviews**

The aim of a Realist Review is to refine a program theory by refining the CMO-model (Pawson, 2006). In the case of this dissertation, the goal was to uncover how social determinants impact on breastfeeding in diverse social contexts illustrated by comparing the countries Germany, the United Kingdom and Ghana.

For the search, eight studies were identified for Germany, 11 for the United Kingdom and six for Ghana. The four social contexts health services, home, work and public that had been outlined in the background were confirmed as relevant (Rollins et al., 2016). The majority of social determinants anticipated for the search and described in the chapter 5.1.3., was confirmed by the Realist Review. For Germany there were nine out of 16, 10 out of 16 for the United Kingdom, and 10

out of 18 for Ghana respectively. The originally added social determinants for Ghana, food security and polygyny yielded no results.

As displayed in table 11, main findings in common were young maternal age, a low maternal educational level, SES/wealth index and social networks relevant for all breastfeeding periods. Maternal educational level can be considered as a “meta” determinant mediating culture/attitude/health behavior as well as health literacy, as will be outlined in detail later. Of course, social networks play a crucial role since they provide essential support for the mother and her child and have a strong influence on breastfeeding success and behavior. Culture displayed differently in the three regions, and is of major importance in the United Kingdom. Work regulation and parental leave in combination with economic constraints are a major challenge to start and continue breastfeeding in the United Kingdom, and leads to the interruption of exclusive breastfeeding in Ghana, which is highly problematic in the social context of HIV. In Germany, these social determinants are not as important anymore because of the prolonged paid parental leave. It is important to note that for neither country results were found in regards to disability in mother and child in respect to breastfeeding.

Another result in common was that for the three countries no studies were found regarding women with disabilities or their disabled offspring and breastfeeding, although they belong to highly vulnerable groups (CSDH, 2008). In Germany, approximately 4.8 mio women with disabilities lived in 2013 (Destatis, 2013). This is also true for the United Kingdom, where 1.7 million disabled parents live (bestbeginnings, 2015) and according to the Housing and Population Census conducted in 2010 in Ghana, 1.6% of the population was women with disabilities (GSS, 2012). Unfortunately, for neither country there are data available how many of them have children and how they are nurtured. Although there are studies on how maternal and infant disability may impact negatively on the start and duration of breastfeeding (Bier, 2007; Ryan et al., 2013; Sumilo et al., 2013), the studies were limited to preterm infants and not included in analysis.

For the United Kingdom, studies looked at whether young women started breastfeeding at all. In general, young age is defined lower than in Germany, and can be as early as adolescence not further specified (Dykes et al., 2003) until the age

group from 20-24 (Bishop et al., 2008). This is the only study revealing what adolescent women need in order to establish successful lactation, namely five types of support. Esteem support was the basic one without which the others would not work (emotional, information and practical assistance) (ibid). A major factor making breastfeeding work for young women was support from the social networks, a finding that is generally shared among all breastfeeding mothers, but within this group particularly important.

Aside of that, two studies had contradictory findings, whereby one revealed that attitudes and beliefs towards breastfeeding were more relevant than age itself, and the other one that working class women were breastfeeding shorter than middle class women who had an age gradient towards young maternal age (Cooper et al., 1993). This finding is consistent with the one from Libuda et al. (2014), who states that maternal age predicted the exclusive breastfeeding period, but not breastfeeding initiation after the inclusion of social status in the analysis. For Ghana, young age was relevant in regards to delayed onset of breastfeeding if it was a home birth and the first delivery (Tawiah-Agyemang et al., 2008). In the clinical setting, age was not important since the delivery assistants usually insisted to start breastfeeding asap after birth (ibid).

As for the two countries United Kingdom and Ghana, there were striking similarities in regards to the pressure to return to work (Gatrell, 2007; Gladzah, 2013; Danso, 2014). In the first case, it led to not starting breastfeeding at all, or only for a reduced period. In the second case, women were not able to practice exclusive breastfeeding for the recommended period of six months. Both countries have in common to be capitalist economies, that is market economies with some welfare policies in case of the United Kingdom (Gov. UK, 2012), and a rather non-regulated economy in the case of Ghana (CIA, 2016). These economic systems shape the conditions of their citizens for income generation in the formal and informal sector, with short paid maternal leave policies mirrored in the two weeks entitlement for mothers in the United Kingdom (GOV.UK, 2016), and eight weeks in Ghana (LABOUR ACT, 2003) in combination with economic constraints to either contribute to income generation and/or secure an employment which have a severe impact on breastfeeding behavior (Rollins et al., 2016). The latter one is

especially true for highly educated women (Gatrell, 2007; Gladzah, 2013; Danso, 2014) and those in managerial employments in the case of Ghana (Gladzah, 2013; Danso, 2014). In the case of Germany as a society with a social welfare system and the possibility of prolonged paid maternal leave up to one year (BMJV, 2015). However, highly qualified women that decide to become mothers and take their maternal leave periods report that this can have a negative influence for their future career (Brandt, 2012).

### **7.1.3 Comparison of BIAS FREE Framework Analyses**

It is important to emphasize that the idea of this analysis was to detect social biases in the guidelines that had been selected. As outlined before, the BIAS FREE Framework was primarily applied as a tool to screen guidelines, but not to provide a solution.

In short, the requirement of WHO for guidelines to contribute to health equity (Oxman et al., 2006) are not fulfilled, and corroborated the findings from Schünemann et al. (2014). As elaborated in detail in chapter 6.6, six guidelines that were subject to analysis contained social biases that were centered around four problem types, with F2 De-contextualization common in all guidelines, which is in agreement with the experience of the BIAS FREE Framework authors Eichler & Burke (2006). Interestingly, the social determinant in this case was social networks. This finding implies that an important aspect of the social reality is neglected despite findings confirmed for all three countries that relevant members exercise a high influence on breastfeeding behavior of the mother in general. However, the father is the only person included in all guidelines and referred to indirectly “parents”, but nobody else from the social network neither taking into account his possible absence as it is the case with one-parent families. This leads to the next problem type, D2 Under representation or exclusion, which was relevant in several cases for one-parent families and social networks. In case only the mother was addressed in a general way without taking into account characteristics, e.g. young age, educational attainment and low socioeconomic status, then the problem type F1 Insensitivity to differences applied, as well as D2 Under representation or exclusion in regards to relevant members of the social networks. In case the parents were addressed, then one-parent families were not

represented with their needs, neither maternal or paternal grandmothers who always have an important say in the decision making on infant feeding, which is of even higher importance in a country like Ghana.

F1 Insensitivity to differences was the second most frequent problem type detected in five guidelines except the NICE Public Health Guidance 11, Maternal and Child Nutrition. The third problem type was H2 Maintaining hierarchy, which was identified in three cases, for both guidelines from the United Kingdom and the Under Five's Child Health Policy.

Due to the design of the BIAS FREE Framework offering the possibility to detect the perpetuation of social hierarchies, it was possible to identify H2 Maintaining hierarchy. This problem type was relevant for cases where breastfeeding counselling, training of staff, and quality assurance were basically limited to medical and technical information and knowledge about breastfeeding. This finding was quite unique and cannot be achieved with the other tools developed to enhance health equity, since they basically integrate socially deprived populations (Commonwealth, 2002; Evans & Brown, 2003; Dans et al., 2006; Oliver et al., 2007; NICE, 2012b; The INCLLEN Trust, 2016). By the means of asking the diagnostic question of whether there are practices in place that are based on a hierarchy is portrayed without indicating the conflicting potential inherent (Eichler & Burke, 2006), it was possible to unravel this essential shortage in guideline formulation. In order for a guideline to achieve highest effectiveness, it is essential that evidence from medical facts as well as social determinants are acknowledged and therefore both perspectives integrated and synchronized to maximize effectiveness. Most importantly, this problem type reveals that the social bias is perpetuated through other documents which breastfeeding interventions are based on, such as the BFHI. However, it was not detected in guidelines for Germany because they did not specify quality criteria neither the Guideline for Prevention of Mother to Child transmission from Ghana.

The last of the four identified problem types F4 Assumed homogeneity was detected in the guidelines for Germany in respect to maternal age and maternal educational level, ignoring the cumulating effect if both social determinants are present.

Lastly, it is important to note that the social determinants relevant for all three countries (young maternal age, low educational attainment and a low socioeconomic position) were not addressed in any except the NICE Public Health Guidance 11, Maternal and Child Nutrition. The first finding suggests that there is a serious health equity gap at stake since vulnerable and socially deprived groups are not explicitly made aware of and thus there is no offer of systematic support. For the guideline mentioning deprived groups, it should be a redundant finding and could be interpreted as a guideline selection bias. However, it is therefore even more surprising that not all relevant deprived groups are mentioned specifically, such as mothers of White British ethnicity, who have highly infringed breastfeeding rates and their children suffer from an unequal burden of disease amendable through breastfeeding (Quigley et al, 2007; ONS, 2009).

#### **7.1.5 Discussion of Realist Synthesis for Germany**

Young maternal age proved relevant for all three breastfeeding stages, start of breastfeeding, exclusive breastfeeding as well as the entire breastfeeding period. However, the age in years is not fixed, and differs between studies of the same country as well as in-between countries. In Germany, young age starts at age 18 (Libuda et al., 2014) and up to an age group of 25 and below (Dulon et al., 2001; Dulon et al., 2003). Six out of seven studies looked for young age and the corresponding period finding a negative relationship, and only the one from Libuda et al (2014) researched breastfeeding start and exclusive breastfeeding, also confirming a negative relationship.

Most studies provided information on maternal age, and all conclude that young maternal age has a negative impact on all three breastfeeding stages (Dulon et al., 2001; Bergmann et al., 2002; Dulon et al, 2003; Soto-Ramirez & Kaus, 2008; Weißenborn, 2009; Pflüger et al., 2010; Libuda et al., 2014). However, maternal age is not uniform with age groups ranging from 20–29 years, and there was no information provided on how young age determines the breastfeeding period, neither in which social context. It is important to note that uptake of breastfeeding was not significant anymore after the inclusion of social status (Libuda et al., 2014).

The next social determinant researched, maternal educational level was also confirmed. Low maternal educational level influences the duration of breastfeeding leading to a shorter period (Dulon et al., 2001; Dulon et al., 2003; Weißenborn, 2009). Young age and low educational level have an additive effect in regards to a reduced breastfeeding period (Weißenborn, 2009). Unfortunately, there is no insight on how or why they influence, but the results indicate that young women with a lower education are more at risk to breastfeed short term, and therefore their children belong to a highly vulnerable group. Pregnant women with a statutory health insurance are entitled to attend a course offered by midwives where they can receive information on infant feeding (Rouw et al., 2014). However, neither its content nor training level of midwives is regulated according to standardized criteria referring to breastfeeding. Since it is presumed that the pathway how level of education influences breastfeeding is by health literacy (Kickbusch, 2001; Braveman et al., 2011), training materials on breastfeeding that increase knowledge levels could be an option to reach this particular group. Besides, the fact that there is no research on the needs of this group reveals a dearth that ought to be closed.

The next social determinant confirmed by the Realist Review was SES. A low SES in the mother had an exacerbating impact on all three breastfeeding stages (Bergmann et al., 2012; Libuda et al., 2014). Again, there was no information provided on the role of the social context. In respect to this social determinant two aspects need to be taken into consideration: the first one is that SES was more relevant than maternal age for the initiation of breastfeeding in one study (Libuda et al., 2014). The other aspect is that SES is measured through the indicators income, education and occupation (Lampert & Kroll, 2009; Lampert et al., 2013), which means that there is an overlap with the social determinant educational level. Young women with a low educational level had an increased risk for a shortened breastfeeding period (Weißenborn, 2009). Maternal educational level is known to influence attitudes towards breastfeeding and breastfeeding behavior (Aidam et al., 2005). One consequence therefore is that it is important to understand which of the indicators of SES has the main impact on breastfeeding and if and/or how they are interlinked. Besides, women with a low SES obviously be-

long to a group where they deserve increased attention to understand and facilitate interventions that enable them to raise their breastfeeding rates.

Another social determinant that was confirmed from the Realist Review and supported by findings over the course of the years is one-parent family. Mothers who live as one-parent families have been more likely to breastfeed short-term (Dulon et al., 2001; Weißenborn, 2009). However, the reasons remain unclear, since there was no information provided on the social context.

The social determinant that was supported by the findings from the literature review was employment status operationalized by returning to work (Dulon et al., 2001). Data collection for the study at stake took place in 1999, and the finding was not supported by other studies. Taking into consideration that work-related social determinants - working conditions, workplace regulation - did not prove important for breastfeeding, nor parental leave, verify the positive impact of a strong legal regulation in maternity care.

The social determinant area of descent was also confirmed as still valid with mothers from West Germany breastfeeding less often than those from East Germany (Dulon et al., 2001; Libuda et al., 2014). However, the Realist Synthesis did not shed light on the mechanism due to lack of information on the mechanism and the social context.

In the social context home, the social determinant, 'social networks', was confirmed for the influence on the duration of breastfeeding. Especially the partner's attitude towards breastfeeding had and has a strong influence on the length of the breastfeeding period (Dulon et al., 2001, Wehrstedt, 2014). Non despite, also other members of the social environment, e.g. family and peers, become relevant if mothers intend to breastfeed beyond a year (ibid). The initial positive attitude may turn into openly expressed disapproval of prolonged breastfeeding. This is also true for the next social determinant that was confirmed, culture. At the normative level, breastfeeding practiced beyond a year is neither socially accepted, nor by the health professionals' side (ibid). Although WHO explicitly reaffirms that breastfeeding recommendations should be adapted to each country individually (2013c), Victora et al. (2016) clearly proved that there is a maternal and child health benefit from prolonged breastfeeding for two years. The health experts'

advice is not in line with WHO recommendations of breastfeeding for two years as outlined in 2.2 and against the evidence of the health benefits of prolonged breastfeeding. Hence, the physician's advice is not based on evidence.

In short, maternal educational level, SES, social networks and culture are the most significant social determinants for Germany. Unfortunately, due to the study designs further insight on how they influence was limited, except for the one from Wehrstedt on breastfeeding beyond a year (2014). Two social contexts were identified as relevant, health services and home. For health services, there are ambiguous findings, since supplementary feeding after birth during the hospital stay are still an issue (Bergmann et al., 2002; Weißenborn, 2007). On the other side, positive advice on breastfeeding during ANC by a midwife or a pediatrician influenced the mother's decision to breastfeed in a positive way (Libuda et al., 2014). Although the Realist Synthesis generated little understanding on how the respective social determinants influence breastfeeding, it revealed that there are vulnerable groups that should be explicitly addressed, and that these two social contexts are of high importance.

#### **7.1.6 Discussion of BIAS FREE Guideline Analysis: Clinical Practice Guideline, Germany**

As a summary, breastfeeding was addressed in a rather general way in the Clinical Practice Guideline 024/005 from Germany.

For early onset, there was no time-specific suggestion, and infant-to-breast contact recommended. However, there seem to be cultural differences expressed in the social determinant geographical location on differences in this practice between the former GDR and FRG. This difference in the social reality needs to be acknowledged since skin-to-skin contact impacts positively on the establishment of lactation (Lawrence & Lawrence, 2011), and might be one of the reasons why breastfeeding duration is shorter, a finding that has been consistent over time (Dulon et al., 2001; Libuda et al., 2014). Hence, there is need for in-depth insight on the reasons thereof and in how far the health staff plays a role (p. 3, 2.3).

As mentioned above, the most frequent problem type was F1 Insensitivity to differences. This is due to the fact that the guideline is formulated in a rather broad

way, and although predominant breastfeeding is recommended, differences in breastfeeding patterns of mothers from different social groups are not further specified (p. 5, 3.2.2). Since for Germany social determinants were mainly confirmed at the micro level, the problem was associated with young maternal age, low educational level and SES, as well as one-parent family. Unfortunately, the Realist Synthesis did not provide an insight how the respective social determinants take effect, no suggestions can be provided in respect to how to address them in order to enable mothers to establish and maintain breastfeeding. For employment status, data collection was from 1998 (Dulon et al., 2001) and therefore has to be cautioned in the view of the laws introduced for paid parental leave thereafter (BMFSF, 2015). As for gender of infant, it might make sense to inform parents that male infants are breastfed for a shorter period. However, since there is evidence from one single study that took place in Berlin (Weißenborn, 2009), generalizability has to be questioned.

Of course, members of the social networks are a crucial element of the social reality of mothers. Since it depends on whether the support is detrimental or supportive for breastfeeding, it is a must to address them in guidelines (p. 5, 3.2 a). If they participate during information and counselling on breastfeeding, they have the chance to understand its importance for maternal and infant health, and to render support eventually. At the same time, parents were addressed directly for necessary information on supplementary feeding not taking into account that mothers may not live as two-, but one-parent families, or the influence of other important members of the social network.

Breastfeeding is the main intervention to prevent the sudden infant death syndrome, and can reduce up to one third of all cases. Therefore, the recommendation on breastfeeding is vital for infant health. Naturally, it is mentioned in the guideline (p. 9, 3.6), but addressed as breastfeeding without mentioning for how long and acknowledging that there are substantial differences in breastfeeding patterns. Since there were no differences made according to social group, the problem type F1 is at stake. It is therefore of high importance to address all groups as mentioned above in order to rest assured that they are enabled to breastfeed, as well as enhance breastfeeding for male infants who have a higher

risk to die if they do not receive any breast milk (Victora et al., 2016). A special focus should be put on women who are young and have a low/lower educational level, a group where two social determinants intersect and its effect cumulates to a high risk group for not maintaining breastfeeding. Since the sudden infant death can occur after the first year of life in 6% of the cases in Germany and there is clear evidence that breastfeeding is protective against it (GBE, 2015), mothers ought to be informed accordingly. Most importantly, there is need for a change in the medical culture and the acknowledgement of the benefits for child health through prolonged breastfeeding (Victora et al., 2016).

The last issue of the guideline relates to early discharge from the hospital and the requirement to inform the mother about breastfeeding. Again, this is a F1 Insensitivity to differences problem, neglecting the effect of the already mentioned social determinants and the effect they have on breastfeeding implementation and sustainment as well as the influence from social networks. Therefore, mothers should be informed about the risks and benefits in regards to the social determinants that influence breastfeeding in order to raise awareness and indicate adequate support.

#### **7.1.7 Discussion of BIAS FREE Guideline Analysis: Guideline for Prevention of Allergies, Germany**

Similar to the first guideline discussed for Germany, the one for the Prevention of Allergies was also formulated in a rather general way. It led to the detection of the problem type F1, Insensitivity to Differences, followed by F2 De-contextualization and F4 Assumed Homogeneity.

The first recommendation refers to breastfeeding fully for four months without further specification. Therefore, F1 Insensitivity to Differences for all those social determinants that lead to a reduced breastfeeding period (young age, low maternal educational level, low SES, one-parent families, women of East German descent, employment status were neglected). Important members of the social networks need to be addressed (F2 De-contextualization problem type).

For atopic disease, children with parents that have a lower SES are less often affected (ibid). Hence, the next recommendation is that prolonged exclusive

breastfeeding is associated with an increased risk to develop an allergy (p. 13). Women who have a higher SES tend to practice exclusive breastfeeding for a longer time (Bergmann et al., 2002; Libuda et al., 2014), a finding consistent over time. However, one difficulty with the guideline under analysis remains that it does not address exclusive breastfeeding. In that case, this is a F1 problem Insensitivity to differences but this time juxtaposed to the common trend of age, and social gradient. However, in the view of the results of the meta-analysis from Victora et al. (2016) that evidence is not conclusive of the effect from breastfeeding on the development of an atopic condition the recommendations have to be treated with caution.

### **7.1.8 Discussion of Realist Synthesis for the United Kingdom**

Young maternal age also proved relevant for breastfeeding in the United Kingdom, whereby it was defined as from adolescence starting at age 16 up to 25 years. As for Germany, all studies conducted revealed that age significantly determined breastfeeding start and duration (Bishop et al., 2008; Brown & Lee, 2011; Cooper et al., 1993; Brown et al., 2010; Dykes et al., 2003; Oakley et al., 2014). Similar to Germany, working class status proved to be more important than young age, but the finding was not confirmed (Cooper et al., 1993). One study revealed that in the social context of health services, specifically the hospital stay, medical staff can have a positive and a negative effect on breastfeeding continuation of adolescent mothers (Dykes et al., 2003). Five types of support were identified, with the one as the “gatekeeper” for the others, esteem. Adolescent mothers belong to a highly vulnerable group that requires extra encouragement and support.

As for Germany, a low educational level had an impact on the breastfeeding start and duration (Cooper et al., 1993; Brown et al., 2010; Lawton et al., 2012). However, since no insight is provided on the social context and a respective mechanism, it has to be presumed that the pathway works the same way as already outlined for Germany, it is likely that it works through health literacy, breastfeeding education should emphasize on this group. However, it seems that there is already plenty of breastfeeding education provided during ANC, leading rather to an overload (Hoddinott, 2014). There is need to understand what kind of support

is effective, and since educational levels of women cannot be targeted easily, identify which influences impact on breastfeeding. This is also true for mothers belonging to a low social class or live in highly deprived areas who breastfeed less often and if yes, for a shorter period of time (Cooper et al., 1993; Bishop et al., 2008; Brown et al., 2010; Oakley et al., 2014). Again, there are no data provided neither on the social context nor for how they influence breastfeeding. However, as Oakley et al. (2014) point out, intention to breastfeed strongly influences the actual breastfeeding success. Since maternal educational level and SES/deprivation are associated, and the first social determinant is mediated through attitude (Aidam et al., 2005), interventions need to aim at the underlying social determinants at the macro level that shapes the norms and that form attitudes and ultimately culture (Lawton et al., 2012). This is even more important since formula feeding has become the normal way to nurture an infant, and thus breastfeeding is socially not accepted anymore impeding women to start at all (Earle, 2002; Gatrell, 2007; Sittlington et al., 2007; Bishop et al., 2008).

The next social determinant at the individual level that had been confirmed is that mothers living in a one-parent family are less likely to start breastfeeding (Bishop et al., 2008) and the last one from the individual level, ethnicity was confirmed as such that women of White British ethnicity are less likely to start breastfeeding and to breastfeed for a longer time than South Asian/non-white women (Lawton et al., 2012; Oakley et al., 2014). In regards to ethnicity and especially for South Asian/Muslim women, the social determinant religion is of importance, since it has a beneficial effect on breastfeeding (Williamson & Sacranie, 2012). On the other side, a low educational level has a stronger influence on the uptake and the duration of breastfeeding than ethnicity (Lawton et al., 2012). This finding supports the importance of the finding of education for breastfeeding as outlined before.

At the meso level, the mother's own mother proved relevant for the uptake of breastfeeding (Bishop et al., 2008). If the husband/family members at home are not supportive, mothers are challenged to continue breastfeeding exclusively for the recommended period of six months (Brown & Lee, 2011). This finding underscores the need to integrate members of the close social networks, more so in

the case of adolescent mothers (Dykes et al., 2003). In general, a positive family culture for exclusive breastfeeding has a strong normative effect for the social environment. Culture as a social determinant revealed its importance in many different ways. The role of culture as the normative framework for forming attitudes on breastfeeding and subsequently behavior has already been discussed under maternal educational level/SES. Two other aspects of culture have been identified as relevant: body and medical culture (Earle, 2002; Gatrell, 2007). For the first one, the breasts of a mother have turned into a sex symbol not “Designed” to nurture a child with the serious consequence that women cannot breastfeed in public (Earle, 2002). Although it is forbidden, breastfeeding mothers experience discrimination in public (GOV.UK, 2016), and the government of Scotland had to launch a law to explicitly allow breastfeeding in public places (legislation.uk.gov, 2016). Another aspect is control of the body at the workplace, where breastfeeding mothers fear that breast milk could leak during work and stain their clothes (Gatrell, 2007). The other aspect of culture is medical culture practiced in the hospital. The impression of the birth experience was unfavorable for continuation already during the hospital stay (Gatrell, 2007). In general, obstetric services seem to have a rather negative effect on the sustaining of breastfeeding (Oakley et al., 2014). Non despite, professional breastfeeding support in PNC delivered by a community midwife was conducive to breastfeeding success.

Work was the last social context detected as relevant for the United Kingdom with a two-fold manifestation. As outlined in the country profile of the United Kingdom (chapter 2.14.2) public employees are entitled to ordinary maternity leave of 26 weeks plus additional maternity leave of 26 weeks, depending on their prior financial contribution to the public system (GOV.UK, 2016). Non despite, women may not be taking the entire period due to the fear that they might lose their jobs and prefer to discontinue breastfeeding (Gatrell, 2007; Skafida, 2012). Those who decided to continue then face the next challenges to express breast milk due to the fact that they are neither entitled to a paid break for breastfeeding/expression of breast milk, nor are employers obliged to provide space and a suitable place for storing (GOV.UK, 2016).

In summary, women who want to breastfeed face serious challenges at all societal levels and in all the social contexts they spend their daily life in. Particularly culture seems to represent a 'meta' social determinant because of the wide implications it has on mothers and their breastfeeding behavior. Obviously, the effect of integrating the sub-dimensions: body culture, the normative change towards infant feeding and the work-related challenges in breastfeeding-related guidelines is questionable. However, it is important to acknowledge that they exist and may impede a mother from starting or continuing breastfeeding. Besides, guidelines may equip women with knowledge how to disguise breastfeeding in public. Since mothers with other than White British ethnicity seem to have less breastfeeding issues, it would be interesting how they cope with these challenges. At the same time, maternal educational level seems to overrule ethnicity. This means that in general women with low educational attainment have more need for support and therefore deserve special attention. In case attitude and related health behavior is at the focus, education on breastfeeding in ANC could have an impact in order to increase their level of health literacy. However, one has to keep in mind that educational level is related to an attitude that affects a health behavior decision and ultimately mediated by culture. In order to instill a change, a comprehensive structural approach is necessary. Non despite, addressing this social determinant in a guideline raises consciousness towards the challenges this particular group encounters.

Aside of this, the exacerbating effects of young maternal age on breastfeeding can be amended by special support during the hospital stay to support breastfeeding continuation, as well as the integration of relevant members ("significant others") from the social network to safeguard breastfeeding in the home context. Medical culture could easily be addressed in guidelines emphasizing needs of mothers with a difficult start, as well as integrating the different types of supports for adolescent mothers, which may also be effective in women of older age. In the view of the fact that maternity services are valued as the "Cinderella" of health services in the United Kingdom expressed by the shortage in staffing and the rotating system that can impede continuity in care on the maternity ward (Dykes et al., 2003), there is need for a change at the institutional and structural level.

### **7.1.9 Discussion of BIAS FREE Guideline Analysis: Clinical Guideline Postnatal Care, United Kingdom**

The first guideline scrutinized for the United Kingdom was the Clinical Guideline CG 37 Postnatal Care. Problem type H2 Maintaining of a hierarchy was identified 20 times, F1 Insensitivity to differences in 12 and F2 Decontextualization in eight cases respectively. The reason for the higher incidence of identified problem types is because of the fact that this guideline was more specific in formulation stating more detailed information.

First of all, recommendations in the Clinical Guideline CG 37 Postnatal Care that are directed at the knowledge level of healthcare professionals (p. 11) were limited to knowledge about the physiology of lactation not extended to crucial other factors influencing breastfeeding. This is repeated in the case of maternity care providers that should elaborate their breastfeeding programs according to BFI criteria (p. 20, 1.3.2). These are mainly centered around medical and management factors of breastfeeding (Rollins et al., 2016), and there is no evidence for the sustainment of breastfeeding per se, nor of exclusive breastfeeding (Patel et al., 2013). The high number for the occurrence of H2 is caused by the fact that all social determinants that were confirmed during the Realist Review (10) were neglected, but the error type H2 actually was only detected in two occasions (Cooper et al., 1993; Earle, 2002; Dykes, 2003; Gatrell, 2007; Sittlington et al., 2007; Bishop et al., 2008; Brown et al., 2010; Brown & Lee, 2011; Lawton et al., 2012; Williamson & Sacranie, 2012; Oakley et al., 2014).

Another social bias that occurred was the fact that “parents” were addressed as receivers of counselling on breastfeeding under representing one-parent families (Bishop et al., 2008) and excluding influential members of the social networks that “co-decide” on the infant feeding choice of the child (Dykes, 2003; Bishop et al., 2008; Brown & Lee, 2011). The next recommendation for health care professionals to dedicate enough time for breastfeeding support misses out on two important aspects (p. 20, 1.3.4). The first one is that adolescent mothers need five types of support (Dykes et al., 2003). Since they belong to a highly vulnerable group with low breastfeeding rates, they deserve special attention. The allocation of time is the second aspect, since maternity care is devalued and thus under-

staffed. This is aggravated by the fact that midwives work in a rotating system. In case that there is much work in the obstetric care, they have to switch wards with the consequence to discontinue care including breastfeeding (ibid).

Similar to the Clinical Practice Guideline 024/005, there is a recommendation on early discharge, but here with the requirement that it should not impact on breastfeeding duration (p. 21, 1.3.8). However, the recommendation is not further specified, neither in terms of who might be at risk nor how to prevent early disruption of breastfeeding. Since young women (Dykes et al., 2003; Bishop et al., 2008; Brown & Lee, 2011; Oakley et al., 2014), mothers with a low educational level (Cooper et al., 1993; Brown et al., 2010; Lawton et al., 2012) and SES/high deprivation index (Cooper et al., 1993; Bishop et al., 2008; Brown et al., 2010; Lawton et al., 2012) and of White British origin (Lawton et al., 2012; Oakley et al., 2014) tend to breastfeed shorter, they should be explicitly focused on. Aside of that, the social reality of mothers should be acknowledged by involving their social networks (Dykes, 2003; Bishop et al., 2008; Brown & Lee, 2011). The last aspect which health professionals need to be aware of is the public and work-related culture hostile towards breastfeeding (Earle, 2002; Gatrell, 2007; Sittlington et al., 2007; Bishop et al., 2008; Brown & Lee, 2011; Lawton et al., 2012), as well as economic constraints/job insecurity that might lead to a shortened maternity leave, that was granted beyond the legal minimum requirement of two/four weeks (Gatrell, 2007; GOV.UK, 2016). However, health professionals are not in a position to affect these social determinants located at the structural level, a task left for policy makers and the governments of the United Kingdom.

The before-last recommendation where a problem type was detected is to give information on breastfeeding including timing of the first feed during the first 24 hours after birth (p. 21, 1.3.10). Commonly, the decision in infant-feeding is finalized latest during the third trimester of pregnancy (Rollins et al., 2016), and a finding consistent for all three countries and over time is that a woman does not take that decision by herself (Dykes, 2003; Bishop et al., 2008; Brown & Lee, 2011). Besides, to give information on the timing for the first breastfeed during the first 24 hours seems awkward in the view of the importance of early onset for successful implementation of lactation (Lawrence & Lawrence, 2011). This error

type is repeated for the recommendation to not ask a mother how she intends to feed her child until after the first skin-to-skin contact (p. 21, 1.3.14).

Finally, it is recommended to render culturally appropriate support (p. 21, 1.3.10). The multifaceted dimension of the social determinant culture and its importance for breastfeeding in the United Kingdom has been discussed in-depth in this chapter. However, it is very likely that the notion of “culturally appropriate” is different for application in the guideline compared to the results here. It would rather make sense to develop an age, educational, social class, one-family and ethnically appropriate support. The concept of culture needs to be reflected and defined along these social determinants, and if culture is at stake, addressing the one that is the strongest counterpart for a breastfeeding-friendly society, the normative change of breast to formula feeding an infant.

#### **7.1.10 Discussion of BIAS FREE Guideline Analysis: Public Health Guideline 11, Maternal and Child Nutrition**

The vast majority of problem types found in the Public Health Guideline 11, Maternal and Child Nutrition were H2 Maintaining hierarchy. The reason was that in three times the emphasis was on the mother knowing how to breastfeed technically and presenting this practice as sufficient, in one instance: education and information for pregnant women on how to breastfeed (p. 34, Recommendation 7), and next: This should focus on how to breastfeed effectively by covering feeding position and how to attach the baby correctly/ Ensure a mother can demonstrate how to position and attach the baby to the breast and can identify signs that the baby is feeding well (p. 36, Recommendation 9). The concept behind is to reduce breastfeeding to a technical issue that if managed well guarantees breastfeeding success. The findings from the Realist Review proved that there are other factors that influence start and sustaining of breastfeeding (Cooper et al., 1993; Earle, 2002; Dykes, 2003; Gatrell, 2007; Sittlington et al., 2007; Bishop et al., 2008; Brown et al., 2010; Brown & Lee, 2011; Lawton et al., 2012; Williamson & Sacranie, 2012; Oakley et al., 2014). In four instances, the instructions for the health professionals were directed solely to breastfeeding management and technique (p. 35, Recommendation 8, Ensure support workers receive training in breastfeeding management from someone with the relevant skills and experience

before they start working with breastfeeding mothers; p. 36, Recommendation 9, This should be provided by someone trained in breastfeeding management; p. 36, Recommendation 9, A midwife or health visitor trained in breastfeeding management should provide an informal group session in the last trimester of pregnancy). Finally, a breastfeeding program should apply BFI criteria (p. 34, Recommendation 7 Implement a structured program that encourages breastfeeding, using BFI as a minimum standard). As already explained for the Clinical Guideline Analysis, the BFI is limited to medical and management factors, and the sustained effect on exclusive/breastfeeding as such has to be questioned (Patel et al., 2013; Rollins et al., 2016).

One recommendation is directed at overcoming the barriers to breastfeeding (P. 34, Breast-feeding, Recommendation 7, activities to raise awareness of the benefits of – and how to over-come the barriers to breastfeeding). In the view of the results from the Realist Review and the importance of structural social determinants in two social contexts determining the possibilities to breastfeed in public and at work and therefore ignoring the social reality of mothers (problem type F2 De-contextualization), this is a rather ambitious aim. As concluded in the prior guideline analysis for the United Kingdom, there is need for a change at the policy level which is not within the scope of a guideline.

Then, in two instances those who are least likely to start and/or to sustain breastfeeding are addressed (p.36, Recommendation 9, and Recommendation 11). However, the list is not complete, since it only entails young women, mothers with a low educational level, and from disadvantaged groups underrepresenting other groups (D2 Underrepresentation or exclusion) In order to attend to all women in need, it is necessary to specifically include White British mothers, whereby it remains unclear whether educational level is the influencing determinant (Lawton et al., 2012), and one-parent families (Bishop et al., 2008).

### **7.1.11 Discussion of Realist Synthesis of Results from Ghana**

For Ghana, the Realist Synthesis enhanced insights on relevant social contexts for breastfeeding.

Since half of the population lives in rural areas, around 27% of all births take place at home (GSS, GHS, and ICF International, 2014). The home environment therefore plays a big role for the onset of breastfeeding in terms of young maternal age and gender of infant at the individual level, social networks at the meso level and culture as well as religion at the macro level all leading to a delay for a substantial amount of time (hours if not days) until the child receives the first colostrum (Tawiah-Agyemang et al., 2008; Aborigo et al., 2012). This is a precarious health behavior, since findings from a study conducted in Ghana supported the importance for early onset within hours after birth for neonatal mortality, leading to a reduction of 22% (UNICEF, 2011) and more so in the view of the fact that infant mortality rates are higher in rural areas than in urban by 10 per 1000 live births (GSS, 2012). Another problem is raised with the way the newborn will be fed. In case it receives the breast milk from a wet nurse, there is an increased risk for the newborn to acquire a disease, e.g. HIV, a threat members of the communities are aware of (Aborigo et al., 2012).

In any case, the mother does not decide by herself when and how her infant will be fed, especially not in the case of her first delivery and not in a rural setting (Tawiah-Agyemang et al., 2008; Aborigo et al., 2012). Family members have a strong influence, and in traditional families possibly the compound leader as well as a priest (Tawiah-Agyemang et al., 2008; Aborigo et al., 2012). However, another important factor is the delivery assistant in both social contexts, home and hospital, who decides when the newborn will be breastfed for the first time (Aidam et al., 2005).

In regards to exclusive breastfeeding, a finding completely opposite to the other two countries, Germany and the United Kingdom, is that delivery in health services is protective for early onset, and in a governmental facility for exclusive breastfeeding (Aidam et al., 2005; Tampah-Naah & Kumi-Kyereme, 2013). This is contradictory to the result from the PROBIT study, which did not support the as-

sertion that hospitals accredited according to the BFHI have a protective effect on breastfeeding behavior (Patel et al., 2013).

In general, women who deliver in a hospital and start breastfeeding can continue at home and members of rural communities are aware of the “new law” (Aborigo et al., 2012). This might be grounded in the respect for health services and health delivery assistants. However, only half of women with a lower educational level and wealth quintile deliver in a health facility (GSS, 2015). This might be one of the reasons why they are less likely to breastfeed exclusively (Aidam et al., 2005). Another reason could be that these women have to resume work at a formal or informal workplace. In Ghana, mothers are entitled to paid maternal leave for 12 weeks, plus one-month regular leave (LABOUR ACT, 2003). However, economic constraints might impede women from taking more time off, and those who work in an informal setting might have to resume their income generating activities even earlier. Around 60% of the poor in Ghana are women, and around one third of households are female-headed (MoH Ghana, 2009). This implies that a substantial amount generates their income in an informal setting without entitlement to a paid maternal leave. At the same time, women who have tertiary education and/or a higher income also have to interrupt exclusive breastfeeding because they cannot practice it at work, as it is the case in a managerial position offering less job flexibility (Gladzah, 2013). In any case, returning to work poses challenges for all mothers. This is partly caused at the institutional level because of working conditions in case of full-time employment (Danso, 2014) and aggravated by shift work leading to the interruption of exclusive breastfeeding prior to six months (Gladzah, 2013). Although breastfeeding mothers are entitled to a one-hour break for breastfeeding that can be taken two times (Sagoe-Moses, 2014), it seems that employers do not provide adequate space for women to breastfeed or express breast milk (Gladzah, 2013; Danso, 2014). Women in informal work settings are worse off because they have no right for a break, and e.g. for traders at the market, there is no provision of a place that is secluded and quiet to practice breastfeeding discreetly (Ottoo et al., 2009).

Considering the importance to maintain exclusive breastfeeding in the case of HIV positive mothers, aside of the stigma associated with the disease, the return

to work poses most likely the biggest challenge and the interruption of breastfeeding. However, for this research there were no studies found on this group of mothers and how they cope with breastfeeding and additional challenges they have to deal with. This is a serious dearth in research that needs to be filled, especially since 15–30% of transmissions occur through breast milk if not practiced exclusively, while mother and child have to receive antiretroviral protection, and up to 45% for prolonged breastfeeding (WHO, 2010). Non despite, WHO (2010) recommended exclusive breastfeeding for six months and in total up to 12 months if mother and child receive an antiretroviral therapy. According to the Ghana AIDS Commission (2014), only half (47%) of pregnant women in need receive this treatment. Although women are taught how to express breast milk during ANC (Sagoe-Moses, 2013), they still need privacy for this activity.

Another aspect was that breastfeeding support seems to be less intensive during PNC compared to OC, although breastfeeding counselling is free and provided at birth clinics (Aidam et al., 2005; Tawiah-Agyemang et al., 2008; Sagoe-Moses, 2014).

Lastly, there are several social determinants that were not confirmed. Most importantly, there were no studies found on the social determinant one-parent family, although roughly one third of all households are headed by a woman (MoH Ghana, 2009). There is need to fill this gap, since mortality rates for children with mothers that live without are a partner are substantially increased (Kanmiki et al., 2014). Also, there were no study results found on the impact of food insecurity on breastfeeding and polygyny, whereby the latter one is positively associated with breastfeeding and reduced under-five mortality rates (Issaka et al., 2014b). Parental leave itself was not researched, but the social context work is thoroughly explored. The studies from Aborigo et al. (2012) and Tawiah-Agyemang et al. (2008) were looking at tribes in the Northern part of Ghana, but related to the dimensions of culture and religion. In any case, there are overlaps between these social determinants, since the area where a person lives is shaped by a certain culture expressed in tradition, which is also the case for the comparison of East and West Germany, where different breastfeeding cultures persist until today.

### **7.1.12 Discussion of BIAS FREE Guideline Analysis: Under Five's Child Health Policy**

In contrast to the documents that had been analyzed for Germany and the United Kingdom, the first one subject to analysis was a policy.

For Ghana, the Under Five's Child Health Policy was subject to analysis. Chapter 5 on technical interventions along the continuum of care was the part analyzed. Problem type H2 Maintaining hierarchy was found six times, and 15 for F1 Insensitivity to differences and F2 De-contextualization.

The first recommendation refers to the immediate post-delivery period, which is the first hour after birth, and emphasizes early initiation of breastfeeding and exclusive breastfeeding (p. 9, 5.2.1). It is important to note that the delivery assistant is the person in charge to decide when the baby will be breastfed for the first time (Aidam et al., 2005). As a consequence, early onset after delivery in health services is ensured, but exclusive breastfeeding is mainly practiced in public hospitals, which were often certified as baby friendly. In the case of a home delivery, young first-time mothers were not in a position to decide when and how her newborn will be breastfed (Tawiah-Agyemang et al., 2008), which is highly problematic in the view of the increased risk for mortality during the first 24 hours after birth (UNICEF, 2011; Boccolini et al., 2013). Another delay for early onset and therefore exclusive breastfeeding can occur in traditional settings for different reasons, as need to consult the Gods first for the right time, a test for the quality of the colostrum and the need to cleanse the mother depending on the gender of the newborn (Tawiah-Agyemang et al., 2008; Aborigo et al., 2012). During that period, the infant might be nursed by a wet nurse or with tea, both practices that introduce the risk for an infection of the newborn through breast milk, e.g. with HIV (Aborigo et al., 2012). In 2013, 1.9% of women were HIV positive (Ghana AIDS Commission, 2014), but according to estimates only two thirds of all women received HIV counselling and around half of them were tested (GSS, 2015). The feeding of tea can cause infections with germs causing diarrhea/a respiratory disease (MoH Ghana, 2009; Lawrence & Lawrence, 2011; UNICEF, 2011; WHO, 2016). However, there is awareness for this problem and Christian communities tend to adhere to what they call "the new law" (Aborigo et al., 2012). Although the

policy gives a general recommendation, it does not distinguish between delivery at a health service facility and at home. Half of the population still lives in rural areas and that there is a rural-urban divide for infant mortality by 10 per 1000 live births (GSS, 2012), and therefore an estimated 27% of all deliveries take place at home (GSS, 2015), there is a necessity to develop a two-tier guideline.

The next period that is addressed in the policy is the neonatal period from day of birth to day 28, and the recommendation to breastfeed exclusively (p. 11, 5.3.1). It was presumed for this analysis that mothers stay at home during this period. Hence, in that social context, grandmothers have a strong say in regards to infant-feeding, which is a challenge for mothers to breastfeed exclusively since in their grandmother's generation mixed feeding was the norm (Otoo et al., 2009; Aborigo et al., 2012). Non despite, the father of the child also has a strong influence (Aidam et al., 2005). It is therefore necessary to address those who are the most important persons of the social network in regards to decision-making. Another aspect is the protective effect of delivery in a health service for exclusive breastfeeding (Aborigo et al., 2012), which could be taken advantage of in order to promote exclusive breastfeeding.

The subsequent recommendation that was analyzed recommended an exclusive breastfeeding period of six months (p.12, 5.4). Hence, the home and the work context were relevant. As for all other countries and guidelines that have been analyzed for this dissertation, maternal educational level influences exclusive breastfeeding behavior (F1 Insensitivity to differences). However, from the findings of the Realist Review, these were mothers with an educational level lower or higher than secondary (Aidam et al., 2005; Gladzah, 2013). For both groups, resumption of work in a formal or informal work setting was most likely the main hurdle, and therefore the social reality (D2 Decontextualization) of these mothers was neglected (Otoo et al., 2009; Gladzah, 2013; Danso, 2014). As in the case of the United Kingdom, there is need to address all social determinants at the policy level. In the view of the importance of breastfeeding an infant exclusively for six months in Ghana to prevent infant mortality from communicable diseases (MoH Ghana, 2009; UNICEF, 2011; Victora et al., 2016), one effective solution is to extend paid maternal leave to minimum six months. However, for mothers who

work in informal settings and/or those belonging to the two thirds of the poor, an equivalent regulation is needed given that their infants are even at more risk to acquire an infectious disease. The same recommendation was repeated (5.4.2.1. Breastfeeding), and therefore the same social determinants and problem types apply. The legal workplace regulation in place including the entitlement to a paid break for breastfeeding (LABOUR ACT, 2003; Sagoe-Moses, 2014) could enable women to continue breastfeeding thereafter if reinforced.

The last recommendation for early and exclusive breastfeeding relate to the implementation of 'Baby Friendly' hospitals according to WHO and UNICEF criteria (p. 15, 5.4.2.9. Baby Friendly Hospitals). Following the same argument that was used for the two guidelines analyzed for the United Kingdom, this is a H2 Maintaining hierarchy problem relevant for all social determinants that have been confirmed for the Realist Review, that were maternal age, maternal educational level, wealth index/SES, employment status, gender of infant, social networks, working conditions, culture, religion, and workplace regulation (Aidam et al., 2005; Tawiah-Agyemang et al., 2008; Otoo et al., 2009; Aborigo et al., 2012; Gladzah, 2013; Danso, 2014). In order to promote early and exclusive breastfeeding, it is necessary to integrate the social perspective of breastfeeding in the two social contexts home and work, as could be demonstrated by the importance of the confirmed social determinants for breastfeeding.

#### **7.1.13 Discussion of BIAS FREE Guideline Analysis: National Guideline for Prevention of Mother to Child Transmission of HIV**

The second and final document that was screened with the BIAS FREE tool was the National Guideline for Prevention of Mother to Child Transmission of HIV. As for the term "Prevention of Mother to Child Transmission (PMTCT)", according to Labbok (2008) it discriminates mothers who should not be blamed for their condition. However, attempts to change the term into "Guideline to Pediatric HIV/AIDS" or "Guideline for Vertical Transmission" were not successful (ibid).

Ghana has a generalized but stable HIV epidemic (MoH, 2010). Although the number of HIV positive women was reduced from 2.9% in 2009 to 1.9% in 2013, the generalized epidemic persists (MoH Ghana, 2009; Ghana AIDS Commission, 2014). Besides, only two thirds of all women supposedly received HIV counsel-

ling and around half of them were tested (GSS, 2015). Since the virus can be transmitted through breast milk with a likeliness from 15-30% in general and even 45% for prolonged breastfeeding, it is of pivotal importance to prevent the transmission (WHO, 2010). The current recommendations are therefore to breastfeed exclusively for six months so that the child is protected against infectious diseases, while mother and child are on antiretroviral treatment (MoH Ghana, 2009; WHO, 2010). Interchanging breastfeeding with bottle-feeding is absolutely contraindicated because the infant might get confused how to suck appropriately (chapter 2.2), which might cause cracked teats exposing the child to maternal blood (Blumental et al., 2014).

The main focus for the guideline analysis was therefore on the implementation and sustainment of exclusive breastfeeding. The first recommendation was to support a HIV positive pregnant woman on making an informed decision on whether her child will be breastfed or formula fed (p. 14, 10.1 During Pregnancy). Due to the stigma associated with the disease, mothers may not want to disclose their HIV positive status to relevant members of their social networks (Laar & Govender, 2011). As a consequence, they most likely will not opt for formula feeding, but for exclusive breastfeeding. At the same time, findings from the Realist Synthesis revealed that the mother did not take the decision on how to feed their infants by themselves (Aidam et al., 2005; Otoo et al., 2009; Aborigo et al., 2012). The problem type therefore is F2 Decontextualization. One possibility would be that members of the social networks are involved actively during counselling in order to support the mother to breastfeed exclusively. The other option is to strengthen the role of health delivery assistants and/or to increase the number delivery at a public certified hospital where possible, because of its positive effect for exclusive breastfeeding in urban as well as rural areas (Aidam et al., 2005; Aborigo et al., 2012; Tampah-Naah & Kumi-Kyereme, 2013). As for the next recommendation, initiate infant feeding choice (p. 15, 11.2 Newborn Care), F2 Decontextualization applied again in regards to social networks as above, and for gender of infant/culture/religion, since in traditional households, onset of breastfeeding was substantially delayed, and exclusive breastfeeding difficult to implement (Tawiah-Agyemang et al., 2008; Aborigo et al., 2012). The risk for a

new route to introduce HIV via the breast milk of a wet nurse has already been discussed during the analysis of the previous guideline (Aborigo et al., 2012).

In this guideline, the respect for local customs, practices, and beliefs when helping a mother making infant-feeding choices was explicitly mentioned (p. 18, 11.5 Infant Feeding Options). Unfortunately, as just described these local customs, practices and beliefs can incur the risk of an HIV exposure in two ways and therefore have to be handled with caution (Tawiah-Agyemang et al., 2008; Aborigo et al., 2012). In order to acknowledge the social reality and therefore challenges of these mothers (F2 Decontextualization), a way to address them has to be developed to support her in practicing exclusive breastfeeding, since this will be most likely the option she “prefers” (Laar & Govender, 2011).

The biggest challenge for the sustainment of exclusive breastfeeding is when the mother has to return to work (p. 17, RCH/Child Welfare Clinic) and/or decides to change the feeding method of her child (ibid). Since it is questionable if the mother alone decides on the issue (Aidam et al., 2005; Otoo et al., 2009; Aborigo et al., 2012), either the most important members of her social network need to get involved to sustain exclusive breastfeeding (F2 De-contextualization), or another option would be to introduce formula feeding for the reason to return to work.

At the same time, exclusive breastfeeding for six months is recommended (p. 19, 1. Breastmilk Feeding Options a. Exclusive Breastfeeding for six months). As outlined for the previous guideline, the social context work poses the highest risk for interrupting exclusive breastfeeding (Otoo et al., 2009; Gladzah, 2013; Danso, 2014), these mothers either need to be furnished with extra rights, e.g. extended maternal leave, more breaks for breastfeeding and a guarantee to be able to breastfeed at the workplace. Although the government of Ghana implemented a strong legal framework to protect breastfeeding at the workplace (LABOUR ACT, 2003; Sagoe-Moses, 2014), it seemed not to function in reality (Otoo et al., 2009; Gladzah, 2013; Danso, 2014). The other possibilities available, exclusive breastfeeding with early cessation or heat-treated breast milk are no likely options because of stigmatization (Laar & Govender, 2011). Besides, women who generated an income in an informal employment could not even claim such a right.

In order to facilitate that HIV positive mothers are able to breastfeed exclusively, the same two recommendations apply as for the Under Five Child Health Policy, to strengthen the status of the delivery assistant and for scaling up delivery in a health facility, thus “normalizing” exclusive breastfeeding, with the additional benefit that mothers would not have to disclose their HIV status and expose themselves and their children to discrimination.

#### **7.1.14 Assessment of Breastfeeding Periods in Guidelines**

In this sub-chapter, the research question is discussed whether the breastfeeding continuum is reflected in the guidelines that were analyzed. The breastfeeding continuum was operationalized into the three breastfeeding periods recommended by WHO (2013c), early onset within one hour, exclusive breastfeeding for six months, and an entire length of two years, but they can be adapted to the country’s burden of disease.

Naturally, the mentioning of early onset is important for those guidelines that deal with the period following birth. This applies to the Guideline for the Healthy Term Newborn in the Birth Clinic, registry no. 024-005 that was not specific in regards to early onset, but just mentioned in general to start breastfeeding as soon as possible, whereas the CG37 Routine and Postnatal Care of Women and their Babies that breastfeeding should be initiated ideally within one hour post-delivery, and the Under Five’s Child Health Policy even 30 minutes postpartum without prior feeding. However, in the National Guideline for Prevention of Mother to Child Transmission of HIV early onset was not mentioned at all, although exclusive breastfeeding is of vital importance for effective risk reduction (Blumental et al., 2014).

As for the recommended period of six months’ exclusive breastfeeding, the first guideline from Germany restricted the mentioning of (exclusive) breastfeeding to the hospital stay and did not mention any further breastfeeding periods. The second one, Guideline for Prevention of Allergies registry no. 061-16, recommends an exclusive breastfeeding period of four full months, an evidence-based recommendation to prevent allergies in children, and not to breastfeed for a prolonged period that is not further defined. WHO (2013c) always emphasizes that recommendations have to be adapted according to the burden of disease prevalent in

the countries, and also in view of the light that the latest meta-analysis from Victora et al. (2016) was not conclusive on the ideal period of exclusive breastfeeding to prevent allergies. In order to enhance primary prevention for the disease with the highest burden in industrialized countries (Brew et al., 2012), there is need to clarify and/or align statements from WHO and national recommendations.

The six-month exclusive breastfeeding period is not indicated in the clinical practice guideline from the United Kingdom, but a statement that formula should only be fed in case of a medical indication during the time spent in the hospital (p. 20), and the public health guideline confirms that it is the country's policy to emphasize exclusive breastfeeding for six months (p. 14). In the Under Five's Child Health Policy 2007-2015, the six-months exclusive breastfeeding period is mentioned too (pp. 12, 13), and the second guideline under revision also emphasizes it (p. 19), since this is the only safe way if an infant is nursed on the basis of breast milk.

The final span the guidelines were searched for was the complete length endorsed for breastfeeding. It was neither mentioned in the guidelines from Germany nor in the clinical practice guideline from the United Kingdom. In the Public Health 11 Guideline, it is recommended that the mother and her child should breastfeed as long as they want to (p. 14). The policy for Ghana is the only document that emphasizes the two-year period and even beyond (p. 12), whereas the second guideline does not state a recommendable length, but comments on the necessity to have totally weaned the child within a period of two weeks when the mother wants to stop breastfeeding and to avoid mixed feeding by any means (p. 19).

As outlined above, the recommendations of WHO (2013c) in regards to the three important breastfeeding stages are not reflected in the guidelines from Germany, partially from the United Kingdom, and for Ghana in their policy which was to be expected, but also in regards to the guideline that was analyzed. This means that the breastfeeding continuum per se is not integrated in one guideline altogether, but addressed in several in an incomplete way illustrating the extent of fragmentation of the breastfeeding continuum.

Two more aspects should be discussed in regards to the breastfeeding periods, whether it suffices to operationalize them simply into the stages that are recommended by WHO (2013c). Taking the results from the Realist Synthesis and the social bias analyses into account, it has become obvious that breastfeeding over the continuum is a highly complex process that should be addressed in a comprehensive way.

The other aspect that deserves attention is whether it is desirable for a mother to breastfeed exclusively for six months and to continue for two years. This creates a dependence of the mother making her indispensable for child nutrition, and also assigns the father a second role (Brandt, 2012). However, for this research the question was what affects mothers positively and negatively in regards to breast feeding. The question whether she is in a position to independently decide whether and for how long she wants to breastfeed was not the aim of this research, but results showed that this decision is most likely taken in accordance with the social environment. The other aspect that raises an urgent need for clarification and further research is the question of the harm to child health through breastfeeding because of the the contamination of breast milk with industrial pollutants (Ochsmann, 2007; Mori & Todaka, 2011; UBA, 2008) and/or aflatoxins (Shuaib et al., 2009; Shuaib et al., 2012), and the association with the breastfeeding period. Unfortunately, the publications from Victora et al. (2016) and Rollins et al. (2016) did not tackle this issue.

In the following chapter, the content-related results are integrated in the original model under research (2.15).

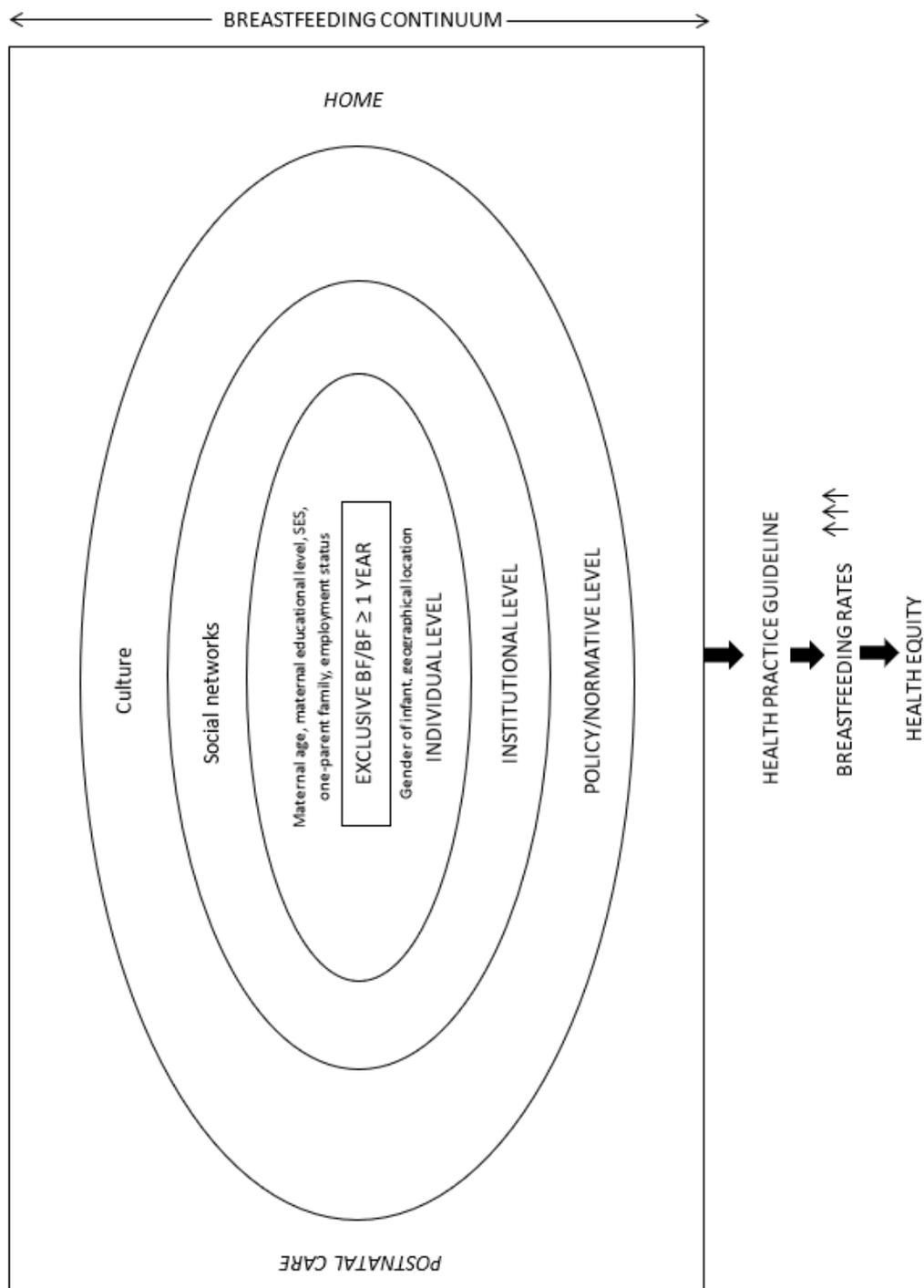
#### **7.1.15 Model of the Breastfeeding Continuum in a Health Practice Guideline**

In order to depict the breastfeeding continuum in a guideline, it is necessary to understand the essential components of the continuum itself. Based on the model for the reproductive care continuum from WHO (2011), the concept of time was translated into the different breastfeeding periods, and place into the social contexts where breastfeeding takes place. However, another element was added: social determinants influencing breastfeeding in the social contexts at stake. Thus the reproductive care continuum was transformed into a breastfeeding continuum aiming to address health equity. The next step was to understand whether

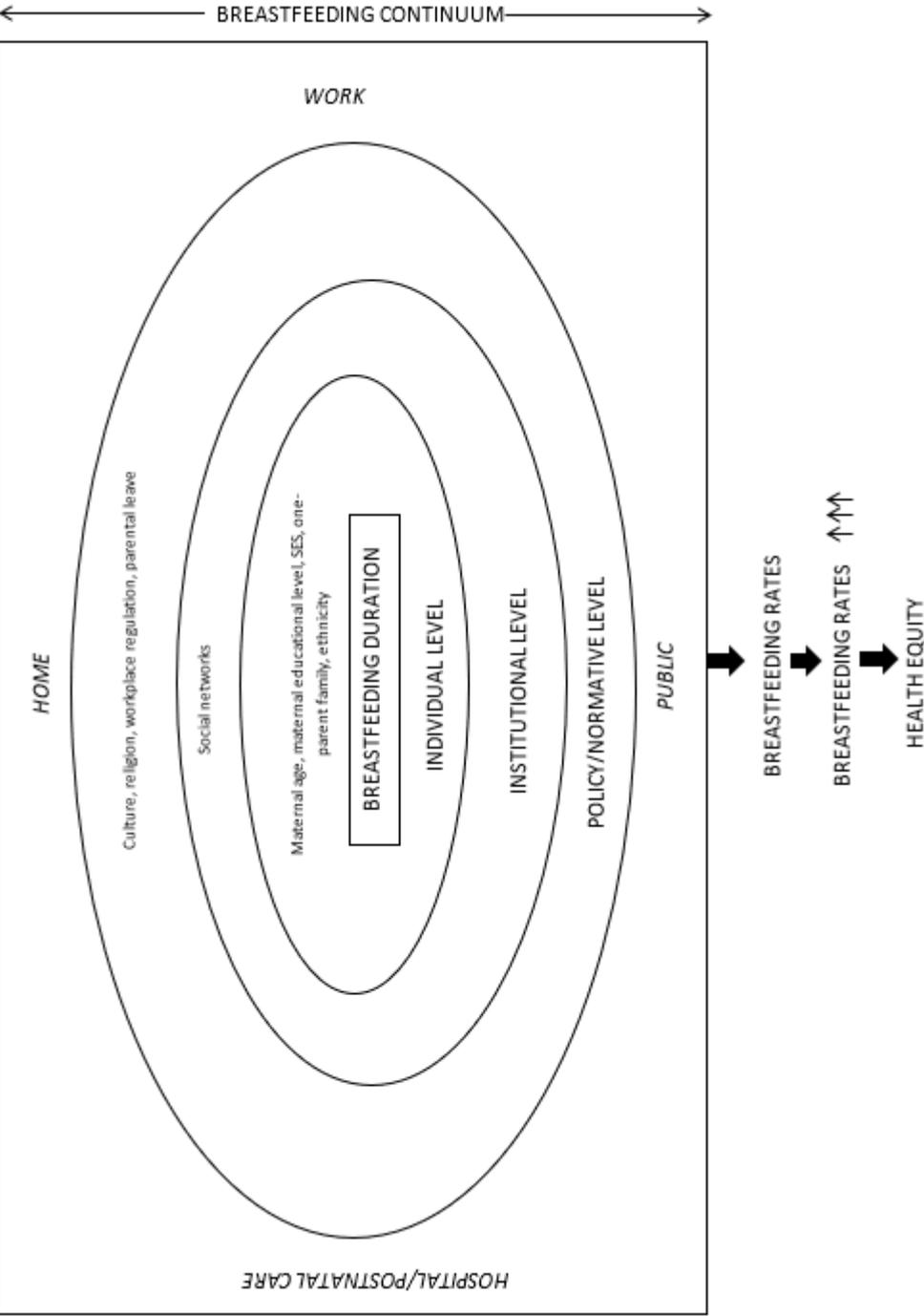
the latter was addressed in guidelines that address breastfeeding, which was not the case except for the Under Five's Child Health Policy mentioning all three stages according to the WHO (2013c) recommendations. On one side this is not a surprise since it is a policy, and not a guideline, but at the same time the other guidelines researched revealed that the breastfeeding as a continuum itself addressed in more than one and different formats of guidelines, e.g. a clinical practice guideline and a public health guideline. This implies that the breastfeeding continuum is neither depicted in one guideline comprehensively. In general, there is a demand to discuss how to integrate clinical and public health in guidelines if they intersect in regards to its care continuum. In the view of the results from the Realist Synthesis and the model for a breastfeeding continuum just outlined here, the author would like to suggest that 1) one guideline should address the three breastfeeding periods, 2) pertinent social determinants of respective social contexts should be integrated. Since this topic deals with a health-related issue, breastfeeding as primary prevention that should be addressed in a guideline that health staff uses in practice, the author would like to suggest to create a health practice guideline.

Based on the results and insights from this research, a model addressing a breastfeeding continuum in a health practice guideline enhancing health equity according to findings from the countries under research was developed. Since the dissertation employed a normative approach, there is need to validate the forthcoming models empirically.

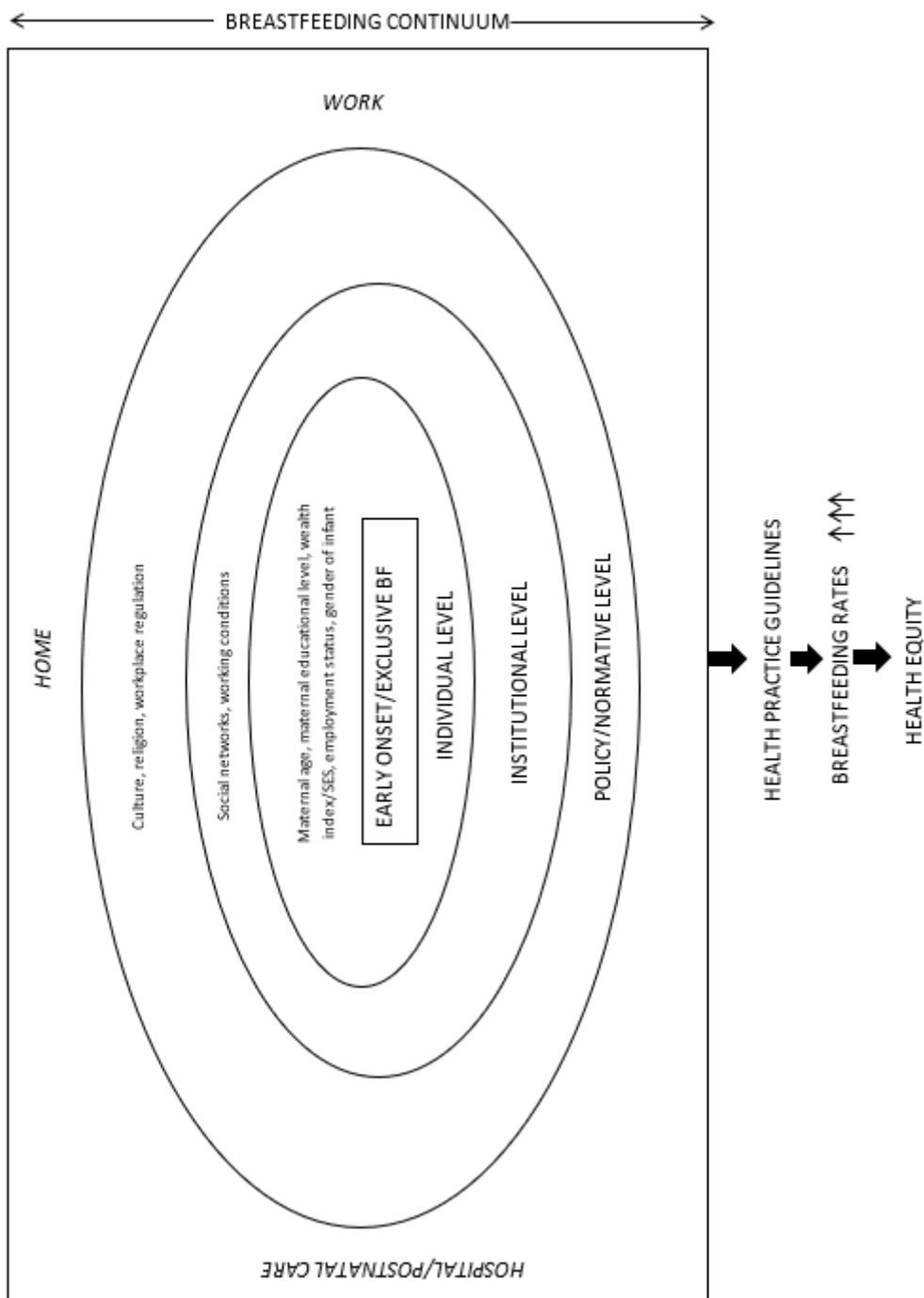
**Figure 13: Model Depicting the Breastfeeding Continuum in a Health Practice Guideline: Germany**



**Figure 14: Model Depicting the Breastfeeding Continuum in a Health Practice Guideline: United Kingdom**



**Figure 15: Model Depicting the Breastfeeding Continuum in a Health Practice Guideline: Ghana**



## **7.2 Methodological Discussion**

In this chapter, the strengths and limitations of the methodological approaches applied will be discussed. It starts with the Realist Review – the search and the Realist Synthesis, followed by a discussion about the quality of retrieved studies, and is completed by the guideline analysis.

### **7.2.1 Strengths and Limitations of the Realist Reviews**

In summary, the Realist Review on breastfeeding determinants in the three countries Germany, the United Kingdom and Ghana revealed that there are substantial geographic variations in how social determinants affect breastfeeding, and that there are also broad variations in the current state of research.

It certainly proved to be the appropriate methodological approach to answer the research aim. It allowed searching for broad variety of literature sources that were beneficial for the analyses, e.g. the master theses Wehrstedt (2014), Gladzah (2013), the doctoral thesis of Weißenborn (2009), and the research report from Danso (2014). Moreover, the analysis of studies with the Realist Synthesis method based on the C-M-O model provided an insight into relevant social determinants, in which social contexts they are important and which effect they have on breastfeeding, answering the primary research aim of this dissertation. Additionally, this methodological approach supplied a sound basis for the justification of problem types when guidelines were dissected with the BIAS FREE Framework. The subdivision according to the societal layer enabled the author to distinguish which ones could realistically be integrated in the guideline in order to increase their effectiveness. This was especially true for the individual social determinants located at the micro level, mainly socio-demographic characteristics such as maternal age, educational level and SES, and one-parent family as well as social networks at the meso level. Although the author was able to detect and confirm social determinants that are situated at the macro level, it is questionable in how far their integration into guidelines enhances their effectiveness, or if a policy promoting prolonged parental leave in Ghana would not be more beneficial.

Although it was not always easy to juggle three different countries with diverse social and economic systems, the concept was chosen because it enriched the findings of the dissertation by contrasting results as well as unveiling similarities. More in-depth information can be found in the first part of this chapter (7.1), where findings from the Realist Review are compared.

One important finding of this methodological approach was that the number of studies retrieved does not reflect the information that can be analyzed for the Realist Synthesis, as in the case of Ghana, where only six studies finally fit the inclusion criteria, but revealed information on 10 social determinants and three social contexts. This is also true for the United Kingdom, where the scope and the mechanisms for the problem in regards to breastfeeding were explored in four different social contexts. This is contrasted by the Realist Synthesis for Germany, where the analysis revealed little information on social contexts and mechanisms caused by the fact that studies for Germany had mostly a quantitative research design, but not pathway studies and therefore no in-depth analyses were possible. This confirms Pawson's (2006) statement that pathway studies are the most suitable study type for a Realist Synthesis. Another weakness occurred due to the fact that the inclusion of study type was expanded from primary to original research.

In the case of the dissertation, the selection criteria for the predefined population, mothers with a child that can be breastfed implying a gestational age of minimum 36+ weeks, and a birth weight of at least 2500g was a major limitation. This led to the exclusion of nationwide, representative studies for all three countries since data on preterm infants were included – the KIGGS data collection for Germany (Lange et al., 2007), the Millenium Cohort Study (Center for Longitudinal Studies, 2016) for the United Kingdom and the Ghana Demographic and Health Survey for Ghana (GDHS, 2015). The other factor that led to a limited number of studies was that the search was restricted to the sources recommend by key experts from the respective countries. In sum this might account for the fact that not all social determinants researched for could be confirmed during studies. Non despite, the fact that there were no findings does not imply that these social determinants are not significant in regards to breastfeeding, e.g. in the case of disabil-

ity. This indicates a dearth in research that cannot be solved with the methodological approach of a Realist Review.

### **7.2.6 Strengths and Weaknesses of Study Quality Assessments of Selected Studies**

The study quality assessment was performed by an overall assessment according to the Scottish Intercollegiate Guidelines Network SIGN. A study quality was ranked high quality (++) if majority of criteria were met and there was little or no risk of bias, acceptable (+) if most criteria were met and there were some flaws that were associated with the risk of bias, as well as low quality (-) if most criteria were not met, or significant flaws in regards to key aspects of the study design occurred. The last option was to reject the study (-) if the study type was wrong or not relevant in regards to the key question.

Ratings were attributed according to reporting versus conduct with risk of bias (selection and information), and absence of potential confounders that were pre-established according to recommendations of the Cochrane Collaboration (Higgins et al., 2008). These were intention to breastfeed, maternal smoking, parity, delivery mode, early infant-to-breast contact, early pacifier use and supplementary feeding as well as the preliminarily identified social determinants relevant for the individual country. According to Higgins et al. (2008), there is a need to distinguish between assessment of the methodological conduct of a study, which is the more common method, and assessment of the risk of bias. They recommend the latter one, since although a study may be conducted according to the highest quality standards possible, it could still contain an important risk of bias. The focus on the risk of bias supports to overcome the challenge between how the study was reported and how the study was conducted. However, it is not always possible to differentiate between the two (ibid). Thus, in the case of the dissertation, a mixed approach was employed, looking for study conduct, quality of reporting and risk of bias. However, since the publications were not compared with the original research protocols expect for the definition of gestational age and birth weight of children, only an overall assessment was undertaken. The quality criteria were only partly suitable for the assessment of the studies that employed a qualitative design, especially for the concept of confounder and generalizability.

In summary, of all studies analyzed none took the pre-established confounder nor all social determinants from the C-M-O model into account (chapter 5.1.3). This implies that the impact of those confounders that were part of the analysis may be under- or overestimated in their effect (Higgins et al., 2008). Another aspect that was outlined in the backgrounds chapter was how breastfeeding was measured. Indicators for assessing breastfeeding varied and therefore hampered on the comparability of results, which is in concordance with the finding from the meta-analysis of Victora et al. (2016). Another finding was that generally the infant populations in studies with a qualitative research design were not defined exactly except in the one from Dykes et al. (2003).

### **7.2.7 Discussion of Study Quality Assessments: Germany**

Of the eight studies retrieved for Germany, one was ranked as high quality (Libuda et al., 2014), then four as acceptable (Dulon et al., 2001; Dulon et al., 2003; Weißenborn, 2009; Wehrstedt, 2014) and three as having low quality (Bergmann et al., 2002; Soto-Ramirez & Karmaus, 2008; Pflüger et al., 2010). They employed mostly a quantitative research design (Dulon et al., 2001; Bergmann et al., 2002; Dulon et al., 2003; Weißenborn, 2007; Soto-Ramirez & Karmaus, 2008; Pflüger et al., 2010; Libuda et al., 2014) and only one qualitative study (Wehrstedt, 2013). As to how breastfeeding was measured, six out of eight publications employed the breastfeeding definition and indicators from WHO (2008) (Dulon et al., 2001; Dulon et al., 2003; Libuda et al., 2014; Weißenborn, 2009 and Pflüger et al., 2010). As depicted in table 7, all studies had breastfeeding as the primary outcome except the one from Bergmann et al. (2002), where it was secondary. Only one study took all predefined confounders into account (Weißenborn, 2007) and none considered all social determinants that had been predefined by the author as known to influence breastfeeding. Another observation was that the interview language for all studies was German and the commandment of German was a pre-requisite for participation. This led to the systematic exclusion of mothers who are either foreigner, have a migration or refugee background or are not able to communicate because of some form of disability. The Robert Koch-Institute collects data representative of migrants, but unfortunately the publications could not be included due to the fact that they did

not exclude preterm babies (Lange et al., 2007), a finding that was confirmed by the researcher in charge (von der Lippe, 2016). Funding sources were declared for all studies except the doctoral thesis from Weißenborn (2007) that had been conducted for the Federal Agency of Risk Assessment. Only in one case a conflict of interests was declared. Interestingly, this was the study where statistical analysis had been performed by the Danone Food Institute. All other studies had been funded and/or supported by governmental or other bodies not related to the milk and formula producing industry.

As for the individual assessments, the study from Libuda et al. (2014) excelled because of its thorough reporting and conduct. However, the five months recall period presents a risk of information bias, and the fact that not pre-defined nor all social determinants were controlled for implies that it remains unclear how strong the impact of low SES on breastfeeding.

The study quality of Dulon et al. (2001) was ranked as acceptable. Although the reporting was intelligible, a clear line and/or focus seemed to be missing at times. A selection bias was reduced through the random sampling of hospitals, but then introduced by the convenience sampling of study participants though this was not further described, and the sample was dominated by mothers with an educational level of less than 10 years. However, the general educational level of women in Germany has been raised substantially since 1998 (Statistisches Bundesamt, 2014), and therefore reliability is questionable if the study was to be repeated in 2016. Only four pre-defined confounder and six social determinants were controlled for, reducing the quality of the research. Despite the statement that all authors of the study declared to have no conflict of interests, the fact that the data analysis was conducted by Danone Food Institute implies interference with objectivity of results.

The next publication from the same sample was the one from Dulon et al. (2003) which received the same ranking. The study was highly intelligible. As for risk of bias, the same occurred as mentioned for Dulon et al. (2001), and since the focus was on the effect of breastfeeding promotion in hospitals, three of the predefined confounders were addressed, but 13 social determinants not.

The doctoral thesis from Weißenborn (2009) was also ranked as acceptable. It was thoroughly described and highly intelligible, but offered an abundance of results not discussed in-depth. It was a regional study conducted in Berlin, and study participants recruited through convenience sampling who moreover had to be fluent in German. Thus a selection bias was introduced. From the predefined confounders, all were addressed. This observation is in line with Cochrane Collaboration (2012) that mentioned that the likeliness for a study to address all relevant confounders increases over time. However, only seven out of 16 social determinants were addressed. A possible risk of bias might be introduced on one side by the high odds ratios and the width of confidence intervals that occurred several times, and although p-values were always statistically significant and/or highly significant, these results might give rise to concern for a rather limited generalizability and/or significant confounders that were omitted (Cochrane Collaboration, 2012).

The final and only study that adopted a qualitative research design and was rated as 'acceptable' was the Master Thesis from Wehrstedt (2013). It was very well described and intelligible. Due to the fact that the researcher who is a trained health professional in midwifery was also the interviewer, an information bias was introduced and a possible recall bias because information on the age of the children was not given. The risk of a selection bias was reduced, but for the infant population no information on gestational age was disclosed. Interviews were conducted in German and results had then to be translated into English, whereby information was possibly lost or the exact meaning was altered due to different cultural interpretations of words and their related concepts.

The study from Bergmann et al. (2002) was rated as of 'low quality'. It was the only study where breastfeeding was a secondary outcome. As for the reporting, the intelligibility was limited, since the study design was not comprehensively described, e.g. maternal age was not specified in years and neither indicators on data for breastfeeding. Regarding predefined confounders, four were addressed and only three out of sixteen social determinants. SES was operationalized by mother's educational and occupational level and the income of the partner which does not exactly reflect the mother's SES.

The next study quality that was rated as 'low' had been authored by Soto-Ramirez & Karmaus (2008). The intelligibility was adequate, but the study infant population was not described in terms of gestational age and no information given on the sampling strategy. As for biases, it remains therefore unclear whether a selection bias might have been introduced, but certainly a recall bias because mothers were asked for a retrospective period of five to seven years. Two predefined confounders had been taken into account, and two of the social determinants. Results from the survival analysis displayed large confidence intervals that increased with age group and median breastfeeding duration. Again, either generalizability was limited and/or important confounders were not acknowledged during the analysis (Cochrane, 2012).

The last publication with a study quality rated as 'low' was the one from Pflüger et al. (2010). As for reporting, the intelligibility was limited at times. Adoption of terms as mothers of "Caucasian" origin seemed awkward in the German/European social context, since the authors did not explain which population group they referred to. Besides, the limitation to "Caucasian" mothers might have introduced a selection bias, and it is not possible to assess whether there was an information bias as data were obtained from two sources, pediatric records and from the birth and 3-month questionnaire. Also, the gestational age of the infant population was not mentioned as such.

#### **7.2.8 Discussion of Study Quality Assessments: United Kingdom**

For the United Kingdom, one study was rated as 'high' quality (Oakley et al., 2014), seven as 'acceptable' (Cooper et al., 1993; Brown & Lee, 2011; Earle, 2002; Dykes et al., 2003; Sittlington et al., 2007; Lawton et al., 2012; Williamson & Sacranie, 2012), and three as 'low' (Gatrell, 2007; Bishop et al., 2008; Brown et al., 2010). They employed diverse research designs, with five qualitative (Earle, 2002; Dykes et al., 2003; Gatrell, 2007; Brown & Lee, 2011; Williamson & Sacranie, 2012) and six quantitative studies (Cooper et al., 1993; Sittlington, et al., 2007; Bishop et al., 2008; Brown et al., 2010; Lawton et al., 2012; Oakley et al., 2014).

As shown in table 8, the 11 studies had breastfeeding as a primary outcome, but only in one publication (Brown & Lee, 2011) the WHO indicators for assessing breastfeeding periods were applied. In six studies breastfeeding was measured either as initiated at all, and/or for how long it was maintained (Cooper et al., 1993; Brown et al., 2010; Earle, 2002; Dykes et al., 2003; Lawton et al., 2012; Williamson & Sacranie, 2012), and two looked at breast- versus bottle-feeding (Sittlington et al., 2007; Bishop et al., 2008). The way breastfeeding was assessed seems to reflect the general situation in the United Kingdom, where exclusive breastfeeding is hardly practiced. Hence, breastfeeding per se is a major issue of concern (McAndrew et al., 2012). None of the analyzed studies took the predefined confounders neither the preliminarily established social determinants into account. However, this is common in qualitative research where there is an emphasis on internal validity in research (Kromrey & Strübing, 2009) and was therefore not counted as decreasing the study quality.

All studies were conducted in English except for the one from Lawton et al. (2012) where interview languages were English, Urdu and Mirpuri (the latter two are languages common in the area of South-East Asia). As in the case of Germany, this might have led to the exclusion of mothers who have a different language background. This is most likely because women who migrated and/or foreign nationals in the United Kingdom display higher breastfeeding rates (Baker et al., 2011; McAndrew et al., 2012; Oakley et al., 2013). At the same time, White British mothers with a low SES seem to represent the most vulnerable group when it comes to breastfeeding rates (McAndrew et al., 2012) and as a consequence nine from the 11 studies researched White British mothers. Only Williamson & Sacranie (2014) interviewed Muslim women with an Asian background, and Lawton et al. (2012) compared South Asian with White British mothers. Funding sources were openly declared from all researchers including statements of conflict of interests except for the studies from Gatrell (2007), Bishop et al (2008) and Lawton et al. (2012).

The study from Oakley et al. (2014) ranked as 'high' quality was well reported and highly intelligible. The population was well defined and results in line with a representative survey conducted prior (Redshaw et al., 2010). An information

bias was reduced through the cohort study design. However, only one confounder from those predefined (mode of delivery) and three of the social determinants – maternal age, SES and ethnicity – were controlled for.

The following six studies were ranked as 'acceptable'. The publication from Cooper et al. (1993) was substantially older than the remaining ones. The study was highly intelligible, but reporting had some shortcomings. As for biases, it was not possible to assess whether a selection bias occurred, and additionally the cross-sectional design implies a risk of a recall (information) bias.

The publication from Brown & Lee (2011) was well described and intelligible. Regarding the conduct, there were some shortcomings because an information bias possibly occurred due to the fact that exclusive breastfeeding was assessed approximately 12 months after cessation.

The next study from Earle (2002) was very well described and highly intelligible. As in the study delineated prior to this, a selection bias occurred due to the purposive sampling method common in qualitative research, but the information bias was substantially reduced because one interviewer conducted all interviews in a prospective manner at three points in time. In this case, even one predefined confounder and one social determinant were addressed.

The study from Dykes et al. (2003) had also employed a qualitative research design and was the only one where the infant population was defined as healthy term babies. As before, a selection bias was introduced through the convenience sampling strategy and the risk of an information bias since the interviewers did not originate from the adolescent community under research. The risk for a recall bias cannot be assessed because there was no information given on the time difference between end of the breastfeeding period and interview.

Sittlington et al. (2007) did the first study conducted in Northern Ireland where breastfeeding rates have not increased compared to the other countries from the United Kingdom (McAndrew et al., 2012). As for reporting, the abundance of text and numbers reduced its intelligibility at times. It employed a quantitative approach with a convenience sampling strategy, thus introducing a risk of selection

bias and the infant population was not defined. Three predefined and five social determinants were addressed as confounders.

The following two studies both researched participants from South Asia. The first one from Lawton et al. (2012) compared White British and mothers with mostly a Pakistani background. The study was thoroughly described, but sometimes difficult to understand due to plentitude of results without explaining the analysis in-depth. The infant population was not defined, but risk of selection bias reduced. However, a possible information bias might have occurred due to the respective ethnicity of the interviewers, which was unfortunately not disclosed. Values for odds ratios were high, which might have been caused by either important confounder that were omitted and/or by the relatively small sample size. This is confirmed by the fact that only two pre-defined and two social determinants were taken into account as confounder.

The final study that was rated as 'acceptable' was from Williamson & Sacranie (2012) had a qualitative research design to investigate Muslim women of South Asian descent. It was very well described and highly intelligible. However, the infant population was not defined, and a selection bias introduced by applying purposive sampling.

As already mentioned above, the study quality from three studies had been rated as 'low'. The one to start with was from Bishop et al. (2008). The study had a quantitative research design and was the second of Northern Ireland. Although very intelligible, the reporting suffered from serious shortcomings, e.g. the infant population was not declared, and there was no information on the data collection period and method of analysis, whereby frequencies were stated as results. A selection bias was introduced due the purposive sampling. The cross-sectional approach causing an information bias was reduced since mothers answered the survey when their infant was five months of age. One predefined confounder and five social determinants were taken into account.

The study from Gatrell (2007) was well described, but the simultaneous presentation and interpretation of results did not enhance its intelligibility. The purposive sampling method introduced a selection bias, and the risk of an information bias cannot be ruled out since interviewees were very much concerned that their iden-

tity might be disclosed, and hence characteristics of interviewers were not described. Besides, mothers were asked when their children had the age of five years involving a recall bias very likely. None of the previously established and five social determinants were addressed though

The final study quality ranked 'low' discussed here is from Brown et al. (2010) and had a quantitative approach. The study was thoroughly described and highly comprehensible. However, some flaws occurred, as the fact that the age of the infant population was not stated nor the period of data collection. The cross-sectional design incurred a recall bias and the convenience sampling a selection bias. Two pre-established and four social determinants were considered for analysis.

#### **7.2.9 Discussion of Study Quality Assessments: Ghana**

As for the rating, from the six studies identified for Ghana one study quality was rated as 'high' (Tawiah-Agyemang et al., 2008), one as 'acceptable' (Aidam et al., 2005) and four as 'low' (Otoo et al., 2009; Aborigo et al., 2012; Gladzah, 2013; Danso, 2014). This is in stark contrast to the findings from the Realist Synthesis, where the study designs answered the C-M-O model in-depth. Half of the studies employed a quantitative (Aidam et al., 2005; Gladzah, 2013; Danso, 2014) and three a qualitative study design (Tawiah-Agyemang et al., 2008; Otoo et al. 2009; Aborigo et al., 2012).

In general, the studies had either a focus on early initiation (Tawiah-Agyemang et al., 2008; Aborigo et al., 2012) in rural areas more prone to traditional practices that lead to a delay of onset and impeded exclusive breastfeeding. In general, the the constrained economic situation in Ghana forces women to contribute to income generation and thus strongly interferes with exclusive breastfeeding (Otoo et al., 2008; Gladzah, 2013; Danso, 2014). As indicated in table 9, all of the studies employed breastfeeding as a primary outcome. However, it was assessed in various ways, with one study explicitly stating the WHO definition of exclusive breastfeeding (Gladzah, 2013) and one applying it without mentioning it specifically (Aidam et al., 2005), and the other ones looked at breastfeeding initiation per se (Tawiah-Agyemang et al., 2008), timing of introduction of solids (Otoo et

al., 2008), for one breastfeeding was not defined at all (Aborigo et al., 2012) and another using the term exclusive breastfeeding without further specification (Danso, 2014).

Studies were conducted in English and prevalent main ethnic languages in Ghana, Akan, Krobo, Ga, Twi and Ewe (Aidam et al., 2005; Tawiah-Agyemang et al., 2008; Otoo et al. 2009; Aborigo et al., 2012). In four cases, funding resources were disclosed and only one entailed a declaration for conflict of interests.

The only study quality that was ranked as 'high' from Tawiah-Agyemang et al. (2008) was nested in the ObaapaVitA study. The qualitative study was very well reported and conducted. Sample size was considerable for the design, and research instruments were developed in a way that their internal validity was enhanced. The purposive sampling strategy introduced a selection bias, and the infant population was not further defined. However, an information bias was substantially reduced since mothers were interviewed approximately eight weeks after delivery. Three previously established confounder and eight social determinants were addressed in the study.

The study from Aidam et al. (2005) was rated as 'acceptable'. It was well reported and intelligible, and the study infant population was defined exactly. Through the convenience sampling method, a selection bias was most likely introduced, but the risk of a recall bias due to the cross-sectional study design reduced by the cross-check with the 24-hour recall. Interestingly, reports from mothers regarding the period of exclusive breastfeeding and the point in time of the introduction of solids was highly reliable. However, as already described in the cases of Germany and the United Kingdom, the width of the confidence interval implies that most likely important confounder were omitted during the analysis, since statistical power was high. From the six predefined confounder, two were controlled for as well as three out of the 18 social determinants.

Of the three studies that were ranked as of low quality, the one to begin with was from Otoo et al. (2009). It had a qualitative research design and had some shortcomings in regards to its reporting and design. There was no information about the recruitment strategy, and the infant population was not defined. The ethnic background of interviewers was not disclosed, and transcripts were translated

into English implying an information bias. As for the interviews, the internal validity was increased due to the reduction of a social desirability bias. From the predefined confounders, none was addressed, and for the 18 social determinants four. It was the only study that included women that were HIV positive. Unfortunately, there were neither specific questions nor answers in regards to this condition and its implication for breastfeeding.

The next study from Aborigo et al. (2012) also employed a qualitative research design. Although the study entailed a detailed description, its intelligibility was limited. As in all other studies of the same type, gestational age of the participating infant population was not defined, and the purposive sampling strategy introduced a selection bias. As for an information bias, interviewers were foreign to the area and thus increasing its likeliness. Measures to validate the interview guide were not described, but four out of six predefined confounders and six out of 10 social determinants addressed.

The final two studies ranked as of low quality both had a quantitative design and were not regular publications, but one master thesis (Gladzah, 2013) and the other one a research report (Danso, 2014). For the first one, the reporting was very well and due to the format allowing an in-depth insight into the current situation of employed women in Ghana. However, the infant population was not defined, and a selection bias was introduced due to the convenience sampling strategy. A serious recall bias occurred since women were reporting their breastfeeding behavior for their infants aged up to ten years. From the previously defined confounder, three and eight of the 18 social determinants were part of analysis.

Finally, the research report from Danso (2014) was very well reported and intelligible, and the infant population was adequately defined. However, a selection bias was introduced due to the purposive sampling method, but was then reduced by randomization of participants from the first sample. A recall bias might have been introduced since children were already aged six to 24 months at the time of the interview, enhanced by the fact that the study employed a cross-sectional design. There was no information given in regards to the validating of

the research instrument, nor for the period of data collection. Neither predefined confounders nor social determinants were taken into the analysis.

### **7.2.2 Interrater Reliabilities of the Three Countries**

For all countries, a Cohens kappa was calculated for the agreement of the decision rate to determine whether it was due to chance or real concordance. A kappa coefficient of 0.21 – 0.4 is interpreted as a modest concordance in rating, and from 0.41 – 0.6 as average, and a range of 0.61 to 0.8 as good (Grouven et al., 2007).

Germany was the first country to be screened and had a Cohen's kappa of 0.33, which is a modest concordance. The generally low values may most likely be owed to the fact that the C-M-O model contained 16 possible social determinants making the screening complex accompanied by an unclear number of social contexts. The process of operationalizing was tedious and might be reflected hence. For the United Kingdom, the value was lowest with  $k = 0.24$  that is interpreted as a modest concordance. During the selection procedure, the main discussion centered around the question of adequate birth weight and gestational age that is conditional for a child to be able to breastfeed. The main challenge was raised because this essential information was often not stated. Interestingly, both reviewers for the United Kingdom shared a reproductive health background. Ghana with a Cohens kappa  $k = 0.46$ , which can be considered as average. Matter of fact, the high amount of retrievals and the the author's need to familiarize with the cultural, political characteristics and living conditions led to a lot of discussions, which most likely contributed to the concordance of the process.

### **7.2.3 Discussion of Guideline Selections**

For Germany and the United Kingdom, two guidelines for each country had been selected with the first one referring to the postnatal period (Guideline for the Healthy Term Newborn in the Birth Clinic; registry no. 024 - 005 and CG37 Routine and Postnatal Care of Women and their Babies) and the second to a disease that can be averted or amended by breastfeeding. In the case of Germany, the Guideline for Prevention of Allergies; registry no. 061-016 relates to a highly prevalent health burden in children (Schlaud et al., 2007; Schmitz et al., 2014),

and for the United Kingdom the Public Health Guideline PH11 is recommended as a complementary guideline for CG 37 and was selected because children that live in low-income households are less likely to be breastfed and/or breastfed for a substantially shorter period resulting in increased hospital admissions and higher rates of child mortality and morbidity (Quigley et al, 2007; ONS, 2009). The documents for Ghana were a policy and a guideline. The Under Five's Child Health Policy: 2007-2015 was chosen since it had been recommended by a Public Health expert (Edusei, 2013), and also because the National Breastfeeding Policy was not translated into a guideline and dates back to 1995 (MoH Ghana, 1995). Naturally, the Under Five's Child Health Policy: 2007-2015 is more comprehensive covering the breastfeeding continuum, especially since it follows all WHO recommendations (2013c). The second document, the Guideline for the Prevention of Mother to Child Transmission of HIV was chosen, since exclusive breastfeeding is essential for protecting against communicable diseases in newborns and infants, and prolonged breastfeeding for child health (MoH Ghana, 2009; Victora et al., 2016). Although comparability in-between the documents is limited, all of them offer an insight into how breastfeeding can be addressed according to country and pertinent health issues at stake.

#### **7.2.4 Appraisal of Guidelines with AGREE II**

All six documents were appraised with the AGREE II instrument (AGREE, 2013). As for the overall ranking, guidelines from Germany were appraised with the lowest quality, followed by Ghana and the United Kingdom, with those guidelines fulfilling most of the required criteria. However, as Polus et al. (2012) stated, there is no threshold percentage provided by the AGREE Consortium that clearly defines and differentiates between a low and high guideline quality. Since scores from the individual domains have to be handled with caution (ibid), the discussion is limited to the three that were subject to further elaboration, domain 2 'Stakeholder Involvement', domain 3 'Rigor of Development' and finally domain 6 'Editorial Independence'.

As for the first domain, the integration of the views from all stakeholders is a measure to assure health equity and validity as well as generalizability of guidelines (AGREE, 2013). However, health equity per se does not represent a criteri-

on for the AGREE II instrument to establish quality although this is required by the WHO (Oxman et al., 2006; Schünemann et al, 2006, Schünemann et al., 2014). Regarding domain 3, the building of the evidence-base, it suffices to verify whether the selection criteria and a link to the evidence-base are provided. This procedure was followed by the guideline appraisers at stake, but has to be taken into account when the question is raised as to whether the evidence-base is reliable (Siering et al., 2015). The last domain that was further investigated was the editorial independence, which is important since the infant formula producing industry has influenced breastfeeding recommendations since its existence (Dykes, 2006; Rollins et al., 2016) and was the case for the guidelines subject to analysis for Germany.

For both the Clinical Practice Guideline for the Healthy Term Newborn in the Birth Clinic; registry no. 024 – 005 as well as the Guideline for Prevention of Allergies; registry no. 061-016, no views and choices from the stakeholder were integrated. As for the first one, there was no evidence-base provided, since it is a consensus-based guideline from expert opinions. Highly problematic in that regard is the fact that three experts had received reimbursements for presentations at Nestlé, Milupa and the Nestlé Nutrition Institute (Addendum declaration of interests, no date). The second guideline, the one for preventing allergies in children, fulfills the requirements and provides evidences including a link where to retrieve it (p. 6), but results are conflicting with WHO (2013c) by recommending only four entire months for exclusive breastfeeding. This statement is conflicting with the breastfeeding recommendation from the national breastfeeding commission in Germany of four to six entire months (BfR, 2016). Five experts declared that they had received reimbursements from the formula producing industries Abbott, Danone, Hipp, Mead Johnson, Nestlé, the milk industry of Bavaria/Baden-Wurtemberg (Leitlinienreport zur Methodik der S3-Leitlinie 061/016: Allergieprävention, pp. 14-19), implying that the scientific independence of guideline development needs to be questioned. Unfortunately, the latest meta-analysis conducted by Victora et al. (2016) did not reveal conclusive evidence in how far breastfeeding is protective against the development of allergies. There is an urgent need for concise evidence on the question which time period has the strongest protective effect on the prevention of allergies in children.

The guidelines from the United Kingdom both involved the views and perspectives of guideline recipients, but in the case of the Public Health Guideline PH11 only one breastfeeding mother, a community member that supports and teaches mothers from low-income households. The evidence-base was thoroughly elaborated and links provided. In case of the guideline CG37 Routine and Postnatal Care of Women and their Babies, the background review is provided in electronic format, the Clinical Guidelines And Evidence Review For Post Natal Care: Routine Post Natal Care Of Recently Delivered Women And Their Babies (Demott et al, 2006). The editorial independence was proven and declared that there was no conflict of interests by guideline developers.

For Ghana, the Under Five's Child Health Policy: 2007-2015 and the National Guideline for Prevention of Mother-To-Child-Transmission of HIV both did not incorporate views and options from recipients, which is a shortfall especially for the fact that HIV positive mothers are highly challenged by their physical condition and their psychosocial situation (Laar & Govender, 2011). The outline of the rationale was excellent in both guidelines, but no evidence-base provided, whereby the second document is an adoption from the WHO guideline (MoH Ghana, 2008) and therefore the question whether that was indispensable. Editorial independence was not possible to appraise although authors of both documents stated their institutional affiliation, but no further information on whether they were involved in pecuniary activities with the formula industry nor a declaration for conflict of interests.

As for the limitations of the AGREE II tool, besides those outlined in the beginning of the chapter dealing with validity and reliability, there were only two appraisers per document instead of the recommended four increasing the likeliness that the score assessment is a result due to chance (AGREE, 2013). This is true for the overall ranking, but not for the domains described in detail since the information from the documents could be procured. Interestingly, the ranking of the guideline quality does not match results from the guideline assessment with the BIAS FREE Framework, as will be demonstrated in the second and content related part of the discussion.

### **7.2.5 Strengths and Limitations of the BIAS FREE Analysis**

As outlined in 2.13.2, the BIAS FREE Framework has been applied in a variety of research projects, as well as for the development of academic courses for different disciplines (BIAS FREE Inc., 2015). Moreover, it was used for the development of gender bias-free Clinical Practice Guidelines.

Applying it for the research at stake, in the author's opinion its biggest strength was that that it detected the hierarchy of "technical and medical" over "social" knowledge. This approach goes beyond any other instrument available at the moment to implement health equity as it achieves to reach beyond the clinical practice and integrate a health practice perspective. Hence the BIAS FREE Framework outperforms the other tools that were developed to enhance health equity (Commonwealth, 2002; Evans & Brown, 2003; Dans et al., 2006; Oliver et al., 2007; NICE, 2012b; The INCLLEN Trust, 2016). The other side of the coin is that the more specific and detailed the formulation of the guideline is, the more it allows detecting biases.

However, the biggest weakness of the BIAS FREE Framework lies in the challenge to distinguish between the different diagnostic questions and how they should be applied. The differences give room for subjectivity and therefore limiting its reliability. Non despite, it certainly deserves further attention.

## **7.3 Conclusions and Recommendations**

The final chapter of the dissertation starts with conclusions followed by recommendations for research and practice.

The aim of this research was to find out which social determinants impact on breastfeeding in what way comparing the three countries Germany, the United Kingdom and Ghana.

“Elucidating specific mediating mechanisms is important both to understanding what the main drivers of health disparities are and to identify interventions to eliminate disparities.” (Roux, 2012: 7).

As breastfeeding is addressed in related guidelines, the next step was to verify whether these social determinants were also included accordingly. The other important aspect of this research was to find out whether the continuum of breastfeeding is adequately reflected in guidelines.

### **7.3.1 Conclusions**

The methodology of a Realist Review employed for the search and the subsequent analyses of the studies by Realist Synthesis proved to be very suitable to answer the research question. Most importantly, the two-fold way to analyze the studies showed that the study quality appraised according to the standard criteria of Evidence-Based Medicine does not necessarily correspond with the information that can be retrieved through a Realist Synthesis of its content. “Studies rated of low methodological quality on the basis of a rigid formulaic method can generate new insights, grounded in the data, while methodologically sound studies may suffer from poor interpretations, leading to insufficient insight into the phenomenon under study (Noyes et al., 2008: 580 in Cochrane, 2012).” This was especially contrasted by the facts that four out of eight studies assessed for Germany were rated as higher, whereas the Realist Syntheses did not yield an insight on the underlying mechanisms. At the same time, studies from a qualitative research design revealed in-depth information on how social determinants affect breastfeeding in certain social contexts, but were not necessarily rated well, as in the case of the United Kingdom and Ghana. Aside of that, the evidence-base of results from the Realist Review conducted for this dissertation is

limited due to the number of studies, implying that there are not many studies that address the topic in an in-depth manner and therefore limiting generalizability of findings. The other factor that was striking and in line with Victora et al. (2016) was that the way in which indicators measure breastfeeding was so diverse although WHO provides a clear definition (WHO, 2013c). Its uniform application for research on breastfeeding would facilitate comparability of results.

Findings from the Realist Review revealed that there are substantial geographical variations of social determinants at all three societal levels relevant in regards to breastfeeding in the respective social contexts. The distinction according to levels was very useful since it helped to distinguish which social determinants can be integrated into guidelines in order to increase their effectiveness, and in which case structural interventions are required in order to instill a change.

Micro level: At the micro level, maternal age, maternal educational level, and SES proved to be relevant for all three countries, a finding that might be true for other countries as well.

For Germany, most determinants were identified at the micro level. This is most likely owed to the fact that the paid parental leave policies introduced in the recent years solved the entire problem of returning to work and breastfeeding at the workplace. Besides the three mentioned above, another one that was identified was one-parent family. This was also true for the United Kingdom, but for Ghana the latter one was not confirmed.

Meso level: The most pertinent social determinant at the meso level was social networks for Germany, the United Kingdom and Ghana, and in the latter case working conditions. Despite that mothers are legally entitled to breastfeed at work but cannot practice in reality reveals the need to reinforce this legal regulation aside of a guideline.

Macro level: The currently prevailing economic pressure in Ghana forces women of basically all social strata to contribute to income generation and poses an extra burden on HIV positive women leading to an interruption of exclusively breastfeeding for six months. As for the United Kingdom, structural barriers are two-fold with a similar situation as in Ghana that mothers need to return to work for eco-

conomic reasons as income generation and/or the fear to lose a job during absence.

A rise for concern gave the quality of guideline elaboration, and issues with accountability of guideline developers in the case of Germany. The fact that developers of both guidelines are affiliated with companies engaged in the production of infant formula weakens their credibility and raises accountability issues, aggravated by the fact no declarations of interests were enclosed. Additionally, the recommendation on the length of exclusive breastfeeding for the guideline to prevent allergies in infants and children (AWMF, 2014) differs from the National Commission on Breastfeeding that explicitly follows WHO recommendations (BfR, 2016). In the case of Ghana, it would have been useful for means of transparency to not only disclose the names and academic titles of guideline developers, but also their institutional affiliations and a declaration of possible conflict of interests. This was not the case for the guidelines from the United Kingdom.

As for other domains of the instrument AGREE II that was used for the guideline appraisal, it entails one domain asking whether stakeholders were involved during the process of elaboration, but no domain for health equity. In order to adhere to WHO (2016a) requirements, there is need to complement the domains accordingly.

The analysis with the BIAS FREE Framework revealed that one major emphasis is clearly placed on medical factors ignoring the social circumstances in which breastfeeding takes place. Reducing problems with breastfeeding to cracked teats, latch problems and correct positioning of the baby is obviously not comprehensive in the view of the identified challenges of breastfeeding. However, the instrument applied for the social bias analysis posed various challenges because it does not offer the possibility to clearly distinguish between problem types and should be revised in order to take full advantage of its potential. The weakness of the guideline analyses was that only problem types could be identified based on evidence retrieved in the Realist Review. The other serious limitation arose due to the technique of asking diagnostic questions and searching for terms – thus detecting more problem types in guidelines that offered more information than in those that were rather short, like those from Germany.

The final question was in how far the breastfeeding periods recommended by WHO (2013c) are reflected in guidelines. None except the Under-Five's Child Health Policy from Ghana addressed the breastfeeding continuum completely.

### **7.3.2 Recommendations**

This final subchapter is divided into two parts. First, recommendations for research are elaborated, followed by those for practice.

Recommendations for future research:

- Several dearths in research were revealed by the Realist Review that should be closed to facilitate further insight, especially regarding disability in mother and child (except for preterm children) in all three countries under research, and one-parent families as well as the challenges HIV poses on women who want to breastfeed and subsequently child health in Ghana.
- For the United Kingdom, further exploration on why mothers of non-White British ethnicities fare better in regards to breastfeeding is needed.
- The effects of how the meta social determinant maternal educational level affects breastfeeding deserves further research as well as for program development to increase breastfeeding rates.
- In order to address the complexity that is implied by how social determinants affect breastfeeding in a respective social context, it is not sufficient to solely mention pertinent social determinants in a guideline. It is therefore recommended to combine the currently existing instruments, such as checklists, with the BIAS FREE framework.
- There is need for research that involves all stakeholders relevant for the different stages of the breastfeeding continuum, e.g. participatory research methods completed by pathway studies in order to increase generalizability of findings.
- Regarding child health, there is an urgent need to clarify the potentially harmful effect of toxins such as PCB and/or aflatoxins transmitted through breast milk, as well as whether there is a relationship of breastfeeding duration and the development of atopic diseases.

- Considering the breastfeeding period of two years, there is need for more evidence regarding the benefit on child health and whether it suits the mother's living condition in regards to income generation as well as personal independence.

Recommendations for practice:

- Relevant social determinants and the pertinent social contexts taking into account the breastfeeding continuum should be considered for guideline formulation in order to enhance their effectiveness and contribute to health equity.
- Staff, volunteers and peers need to be trained according to these guidelines in order to offer comprehensive counselling.
- Mothers should be enabled to breastfeed their children exclusively for the recommended period of six months, e.g. by means of a policy that entitles them to a paid or otherwise financed maternal leave.

## 8 Reference list

Aborigo, R.A.; Moyer, C.; Rominski, S.; Adongo, P.; Williams, J.; Logonia, G.; Af-fah, G.; Hodgson, A.; Engmann, C. (2012). Infant nutrition in the first seven days of life in rural northern Ghana. *BMC Pregnancy and Childbirth*, 12:76

Acosta, N.; Pollard, J.; Mosquera, P.; Reveiz, L. Equidad en el desarrollo de guías de práctica clínica (2011). The concept of equity when developing clinical practice guidelines. *Rev. salud pública*. 13 (2): 327-338

Addendum, Erklärungen über Interessenkonflikte: Tabellarische Zusammenfassung, no date. Available together with the Guideline for the Healthy Term Newborn in the Birth Clinic; registry no. 024, 2012

AFS e.V., (2016). Arbeitsgemeinschaft Freier Stillgruppen e.V. Website. Available at: <http://www.afs-stillen.de/>. Retrieved: February 22, 2016

Agho, K., Dibley, M., Odiase, J., Ogbonmwan, S. (2011). *BMC Pregnancy and Childbirth*. 11:2

AGREE (2009). The AGREE II Instrument. Available at: <http://www.agreetrust.org>. Retrieved: August 09, 2013

AGREE (2013). Website. Available at: <http://www.agreetrust.org/>. Retrieved: February 05, 2013

Aidam, B.; Perez-Escamilla, R; Lartey, A.; Aidam, J. (2005). Factors associated with exclusive breastfeeding in Accra, Ghana. *European Journal of Clinical Nutrition*, 59 (6): 789-96

Aldrich, R.; Kemp, L.; Stuart Williams, J.; Harris, E.; Simpson, S.; Wilson, A.; McGill, K.; Byles, J.; Lowe, J.; Jackson, T. (2003). Using socioeconomic evidence in clinical practice guidelines. *BMJ VOLUME 327 29 NOVEMBER*

Allergy UK. British Allergy Foundation. Child allergy (2013). Website. Available at: <http://www.allergyuk.org/child-allergy-menu/child-allergy>. Retrieved: February 05, 2013

Amir L.H.; Introducing a new journal. *International Breastfeeding Journal* 2006

Aryeetey, R.; Antwi, C. L. (2013). Re-assessment of selected Baby-Friendly maternity facilities in Accra, Ghana. *International Breastfeeding Journal*, 8:15

Aryeetey, R.; Goh, Y. (2013). Duration of Exclusive Breastfeeding and Subsequent Child Feeding Adequacy. Ghana Medical Journal, Vol. 47, No. 1

AT. (2015). Tafesh, A. Second appraiser for the United Kingdom (guidelines). Master of Science in Public Health, Master student at Master Program of "Physical Activity and Health"

AWMF (2004). Arbeitsgemeinschaft der Wissenschaftlichen Medizinischen Fachgesellschaften e.V. Erarbeitung von Leitlinien für Diagnostik und Therapie. Methodische Empfehlungen "Leitlinie für Leitlinien"

AWMF (2012). Arbeitsgemeinschaft der Wissenschaftlichen Medizinischen Fachgesellschaften e.V. Leitlinie der Deutschen Gesellschaft für Gynäkologie und Geburtshilfe (DGGG), der Deutschen Gesellschaft für Kinder- und Jugendmedizin (DGKJ), der Deutschen Gesellschaft für Perinatale Medizin (DGPM), dem Deutschen Hebammenverband und der Gesellschaft für Neonatologie und Pädiatrische Intensivmedizin (GNPI). Betreuung von gesunden reifen Neugeborenen in der Geburtsklinik. Available at: [http://www.awmf.org/uploads/tx\\_szleitlinien/024-005l\\_S2k\\_Betreuung\\_von\\_gesunden\\_reifen\\_Neugeborenen\\_2012-10.pdf](http://www.awmf.org/uploads/tx_szleitlinien/024-005l_S2k_Betreuung_von_gesunden_reifen_Neugeborenen_2012-10.pdf). Retrieved: August 11, 2013

AWMF (2014). Arbeitsgemeinschaft der Wissenschaftlichen Medizinischen Fachgesellschaften e.V. Deutsche Gesellschaft für Allergologie und klinische Immunologie (DGAKI) in Zusammenarbeit mit dem Ärzteverband Deutscher Allergologen (ÄDA), der Deutschen Gesellschaft für Kinder- und Jugendmedizin (DGKJ), der Deutschen Dermatologischen Gesellschaft (DDG), und der Gesellschaft für Pädiatrische Allergologie (GPA). Allergieprävention,. Available at: [http://www.awmf.org/uploads/tx\\_szleitlinien/061-016\\_S3\\_Allergiepraevention\\_03-2009\\_03-2014.pdf](http://www.awmf.org/uploads/tx_szleitlinien/061-016_S3_Allergiepraevention_03-2009_03-2014.pdf). Retrieved: March 03, 2015

Babitsch, B. (2005): Soziale Ungleichheit, Geschlecht und Gesundheit, Bern: Hans Huber

Bergmann, R.; Diepgen, T.L.; Kuss, O.; Bergmann, K.E.; Kujat, J.; Dudenhausen, J.W.; Wahn, U. and the MAS-study group (2002). Breastfeeding duration is a risk factors for atopic eczema. Clin Exp All, 32: 205-209

BfR (2016). Bundesinstitut für Risikobewertung. Website. Available at: [http://www.bfr.bund.de/de/presseinformation/2015/12/nationale\\_stillkommission\\_weiterhin\\_4\\_bis\\_6\\_monate\\_ausschliesslich\\_stillen-194091.html](http://www.bfr.bund.de/de/presseinformation/2015/12/nationale_stillkommission_weiterhin_4_bis_6_monate_ausschliesslich_stillen-194091.html). Retrieved: February 22, 2016

BIAS FREE Inc. 2015. Website. Available at: <http://www.biasfree.org/applications.html>. Retrieved: January 18, 2016.

BiB (2015). Bundesinstitut für Bevölkerungsforschung. Website. Säuglingssterblichkeit. Available at: <http://www.bib-demografie.de/SharedDocs/Glossareintraege/DE/S/saeuglingssterblichkeit.html>. Retrieved: February 22, 2016

Bier, A. (2007). Stillen eines Kindes mit Behinderung. Erfahrungsberichte über Schwierigkeiten und Chancen. Facharbeit im Rahmen der VELB-Seminarreihe zur Vorbereitung auf das Examen zur Still- und Laktationsberaterin IBCLC 2006/2007

BirthChoiceUK. 2012. Summary of home birth rates 2011. Available at: <http://www.birthchoiceuk.com/Professionals/BirthChoiceUKFrame.htm?http://www.birthchoiceuk.com/Professionals/statistics.htm>. Retrieved: March 03, 2016

Bishop, H.; Cousins, W.; Casson, K.; Moore, A. (2008). Culture and Caregivers: Factors Influencing Breastfeeding among Mothers in West Belfast, Northern Ireland. *Child Care in Practice*, Vol. 14, No. 2, pp. 165-179

Bitzer, E.M.; Schwartz, F. W.; Dörning, H.; Walter, U. (2012). Evaluation und Qualitätssicherung im Gesundheitswesen. In: Hurrelmann, K.; Razum, O. (Hrsg.) *Handbuch Gesundheitswissenschaften*. 5.vollständig überarbeitete Auflage. Beltz Juventa Verlag

Blumental, S.; Ferster, A.; Van den Wijngaert, S.; Lepage, P. (2014). HIV Transmission Through Breastfeeding: Still Possible in Developed Countries *PEDIATRICS* Volume 134, Number 3

BMBF (2016). Bundesministerium für Bildung und Forschung. Website. Gesundheit von Kindern und Jugendlichen. Available at: <http://www.gesundheitsforschung-bmbf.de/de/126.php>. Retrieved: February 22, 2016

BMFSFJ (2015). Bundesministerium für Familie, Frauen, Senioren und Jugend. Die Elternzeit. Website. Available at: <http://www.bmfsfj.de/BMFSFJ/Service/rechner,did=16318.html>. Retrieved: February 22, 2016

BMG (2016). Bundesministerium für Gesundheit.. Website. Available at: <http://www.bmg.bund.de/themen/krankenversicherung/zahlen-und-fakten-zur-krankenversicherung.html>. Retrieved: February 22, 2016

BMJV (2012). Bundesministerium der Justiz und für Verbraucherschutz: Gesetz zum Schutz der erwerbstätigen Mutter (Mutterschutzgesetz - MuSchG). Available at: <http://www.gesetze-im-internet.de/bundesrecht/muschg/gesamt.pdf>. Retrieved: February 22, 2016

BMJV (2015). Bundesministerium für Justiz und Verbraucherschutz. Sozialgesetzbuch (SGB) Fünftes Buch (V) - Gesetzliche Krankenversicherung - (Artikel 1 des Gesetzes v. 20. Dezember 1988, BGBl. I S. 2477), § 134a Versorgung mit Hebammenhilfe. Available at: [https://www.gesetze-im-internet.de/sgb\\_5/\\_\\_\\_134a.html](https://www.gesetze-im-internet.de/sgb_5/___134a.html). Retrieved: February 22, 2016

Boccolini CS, de Carvalho ML, de Oliveira MI, Pérez-Escamilla R. (2013). Breast-feeding during the first hour of life and neonatal mortality. *J Pediatr (Rio J)*, 89:131–6

Bonita, R. (2006). Basic epidemiology / R. Bonita, R. Beaglehole, T. Kjellström. 2nd edition. WHO

Brandt, G. (2012). Vereinbarkeit von Familie und Beruf. HIS Hochschul-Informationen-System GmbH, Hannover

Bundeszentrale für politische Bildung (2012). Die soziale Situation in Deutschland: Religionszugehörigkeit. Available at: <http://www.bpb.de/nachschlagen/zahlen-und-fakten/soziale-situation-in-deutschland/145148/religionszugehoerigkeit>. Retrieved: May 03, 2014

BpB (2016). Website. Bundeszentrale für politische Bildung. Available at: <http://www.bpb.de/nachschlagen/lexika/lexikon-der-wirtschaft/20642/soziale-marktwirtschaft2016>. Retrieved: February 22, 2016

Braveman, P.; Gruskin, S. Defining equity and health (2003). *J Epidemiology Community Health*, Vol. 57, pp. 254-258

Braveman, P.; Kumanyika, S.; Fielding, J.; LaVeist, T.; Borrell, L.N.; Manderscheid, R.; Troutman, A. (2011). Health Disparities and Health Equity: The Issue Is Justice. *Am J Public Health*. December; 101(Suppl 1): S149–S155

Braveman, P. (2013). Social conditions, health equity, and human rights. *Health and Human Rights Journal*, 1-20.

Brew, B; Kull, I.; Garden, F.; Almqvist, C.; Bergstrom, A., Lind, T., Webb, K.; Wickman, M.; Marks, G. (2012). Breastfeeding, asthma, and allergy: a tale of two cities. *Pediatric Allergy Immunology*, 23: 75–82

Brown, A.E.; Raynor, P.; Benton, D.; Lee, M.D. (2010). Indices of Multiple Deprivation predict breastfeeding duration in England and Wales. *European Journal of Public Health*, Vol. 20, No. 2, 231–235

Brown, A.; Lee, M. (2011). An Exploration of the Attitudes and Experiences of Mothers in the United Kingdom Who Chose to Breastfeed Exclusively for 6 Months Postpartum. *BREASTFEEDING MEDICINE*, Volume 6, Number 4

Brownson, R.; Chiqui, J. F.; Stamatakis, K. (2009). Understanding Evidence-Based Public Health Policy. *Am J Public Health*. 2009 September; 99(9): 1576–1583.

Burke, M. Eichler, M. (2006). The BIAS FREE Framework. *Global Forum for Health Research*.

Casas-Zamora, J. A.; Ibrahim, S. (2004). Confronting Health Inequity: The Global Dimension. *Am J Public Health*, December; 94(12): 2055–2058

CLB. Lage Barbosa, C. (2014/15). Second reviewer for Germany (Realist Review). Master of Science in Epidemiology, researcher at the Robert Koch-Institute, Germany

CIA. Central Intelligence Agency. Factbook. (2016). Available at: <https://www.cia.gov/library/publications/the-world-factbook/geos/gh.html>  
Retrieved: February 23, 2016

Commonwealth of Australia (2002). Using socioeconomic evidence in clinical practice guidelines. National Health and Medical Research Council. Available at [https://www.nhmrc.gov.au/\\_files\\_nhmrc/publications/attachments/cp89.pdf](https://www.nhmrc.gov.au/_files_nhmrc/publications/attachments/cp89.pdf). Retrieved: January 14, 2014

COOPER, P.J.; MURRAY, L.; STEIN, A. PSYCHOSOCIAL FACTORS ASSOCIATED WITH THE EARLY TERMINATION OF BREAST-FEEDING (1993). *Journal of Psychosomatic Research*, Vol. 37. No. 2, pp 171b176. 1993

CSDH (2008). Commission of the Social Determinants on Health. Closing the gap in a generation: health equity through action on the social determinants of health. Final Report of the Commission on Social Determinants of Health. Geneva, World Health Organization

Daniels, N. (2008). *Just Health. Meeting health needs fairly.* Cambridge University Press. New York

Dans, A.; Dans, L.; Oxman, A.; Robinson, V.; Acuine, J.; Tugwell, P.; Dennis, R.; Kang, D. (2007). Assessing equity in clinical practice guidelines. *Journal of Clinical Epidemiology* 60

Danso, J. (2014) Examining the Practice of Exclusive Breastfeeding among Professional Working Mothers in Kumasi Metropolis of Ghana. *International Journal of Nursing*, Vol. 1, No. 1; June

Demott, K.; Bick, D.; Norman R.; Ritchie, G.; Turnbull, N.; Adams, C.; Barry, C.; Byrom, S.; Elliman, D.; Marchant, S.; Mccandlish, R.; Mellows, H.; Neale, C.; Parker, M.; Tait, P.; Taylor C. (2006). *Clinical Guidelines And Evidence Review For Post Natal Care: Routine Post Natal Care Of Recently Delivered Women And Their Babies Clinical Guideline CG37 Routine and Postnatal Care of Women and their Babies.*

Diercke International Atlas (2011). Westermann Verlag

DO. Opoku, D. (2014/15). Second reviewer for Ghana (Realist Review). Master of Science in Public Health, doctoral student for Public Health at Technical University Berlin, Germany

Dubois, L.; Girard, M. (2003) Social determinants of initiation, duration and exclusivity of breastfeeding at the population level: the results of the Longitudinal Study of Child Development in Quebec (ELDEQ 1998-2002). *Can J Public Health*. Jul-Aug;94(4):300-5

Dulon, M.; Kersting, M.; Bender, R. (2003) Breastfeeding promotion in non-UNICEF-certified hospitals and long-term breastfeeding success in Germany. *Acta Paediatr* 92: 653-658

Dulon, M.; Kersting, M.; Schach, S. (2001) Duration of breastfeeding and associated factors in Western and Eastern Germany. *Acta Paediatr* 90: 931- 935

Dykes, F. *BREASTFEEDING IN HOSPITAL. MOTHERS; MIDWIVES AND THE PRODUCTION LINE* (2006). Routledge Taylor and Francis Group, LONDON AND NEW YORK.

Dykes, F.; Hall Moran, V.; Burt, S.; Edwards, J. (2003) Adolescent Mothers and Breastfeeding: Experiences and Support Needs—An Exploratory Study. *J Hum Lact* 19(4)

Earle, S. (2002). Factors affecting the initiation of breastfeeding: implications for breastfeeding promotion. *HEALTH PROMOTION INTERNATIONAL*, Vol. 17, No. 3

Eccles M.P.; Armstrong, D.; Baker, R.; Cleary, C.; Davies, H.; Davies, S.; Glasziou, P.; Iltott, I.; Kinmonth, A.-L.; Leng, G.; Logan, S.; Marteau, T.; Michie, S.; Rogers, H.; Rycroft-Malone, J.; Sibbald, B. (2009) An implementation research agenda. *Implementation Science*, 4:18

Edusei, A. (2013) Senior Lecturer at the Department of Community Health specialized in nutrition at Kwame Nkrumah University of Science and Technology University, Kumasi, Ghana. Personal Communication

Eichler, M. (1991) *Nonsexist Research Methods: A Practical Guide*. Routledge, New York, USA

Eichler, M. in: Baldaszi, E.; Bloomfield, K.; den Broeder, L.; Burke, M.A.; Diggins-Rösner, A.; Doyal, L.; Eichler, M.; Fuchs, J.; Haafkens, J.; Hagemann-White, C.; Hammarström, A.; Jahn, I.; Junge-Reyer, I.; Kauppinen, K.; Maguire, P.; Maschewsky-Schneider, U.; Moerman, C.J.; Reale, E.; Sardelli, V.; Vinay, P.; Wimmer-Puchinger, B.; Zemp, E. (2001) *Gender Based Analysis (GBA) in Public Health Research, Policy and Practice*. Documentation of the International Workshop in Berlin, Berlin Centre of Public Health, the European Women's Health Network and the German Society for Social Medicine and Prevention (DGSMMP)

Eichler, M. Burke, M. (2006) The BIAS FREE Framework. A New Analytical Tool for Global Health Research. *Canadian Journal of Public Health*, VOLUME 97, NO. 1, pp. 63-68

Elkeles, T., Mielck, A. (1997). Entwicklung eines Modells zur Erklärung und Verringerung gesundheitlicher Ungleichheit. *Das Gesundheitswesen* 26, S. 23 – 44

ESCR (2014). Website. Center on dynamics of ethnicity (CoDE). Which ethnic groups have the poorest health? Ethnic health inequalities 1991 – 2011. Available at: <http://www.ethnicity.ac.uk/>. Retrieved: May 04, 2014.

Europäisches Zentrum für Laktation und Stillen (2016). Webseite. Die Initiative „Baby-Friendly Hospital“ – BFHI. Available at: <http://www.stilleninstitut.com/de/initiative-baby-friendly-hospital-bfhi-1.html>. Retrieved: February 24, 2016

Evans T.; Brown H. (2003) Road traffic crashes: operationalizing equity in the context of health sector reform. *Inj Control Saf Promot*;10:11-2

Evans, A.; Marinelli, K.A.; Scott Taylor, J. and The Academy of Breastfeeding Medicine (2014). Guidelines for Hospital Discharge of the Breastfeeding Term Newborn and Mother: "The Going Home Protocol," Revised 2014. BREASTFEEDING MEDICINE. Volume 9, Number 1, Mary Ann Liebert, Inc.

Every Woman Every Child (2015). The Global Strategy for Women's, Children's and Adolescents' Health (2016-2030). Survive Thrive Transform. Sustainable Development Goals. Every Woman Every Child

FAO (2009). Food and Agricultural Organization. Nutrition Country Profile. Republic of Ghana. Rome: Food and Agricultural Organization.

Flohr, C.; Nagel, G.; Weinmayr, G.; Kleiner, A.; Strachan, D.P. ; William H.C. and the ISAAC Phase Two Study Group (2011). Lack of evidence for a protective effect of prolonged breastfeeding on childhood eczema: lessons from the International Study of Asthma and Allergies in Childhood (ISAAC) Phase Two. *British Journal of Dermatology*, 165:1280–1289

Folson, G. (2014) Researcher at the Noguchi Memorial Institute of Medical Research, University of Ghana. Personal communication

Gatrell, C.J. (2007). Secrets and lies: breastfeeding and paid professional work. *Social Science & Medicine* 65, 393–404

Gauthier-Loiselle, M. (2013). THREE ESSAYS IN PUBLIC POLICIES: UNEMPLOYMENT INSURANCE, PARENTAL LEAVE, AND BREASTFEEDING SUBSIDY. A DISSERTATION

GBE. Gesundheitsberichterstattung des Bundes. SIDS. Available at: <http://www.gbe-bund.de/stichworte/SIDS.html>. Retrieved: October 10, 2016

Ghana Health Service (2015). Website. Newborn Care Programme. Available at: <http://www.ghanahealthservice.org/programme-scat.php?ghspid=3&ghsscid=94>. Retrieved: February 23, 2016

GK. Kaczmarczyk, G. (2015). Second appraiser for Germany (guidelines). Prof. em. Charité Universitätsmedizin Berlin, expert for gendered global health

Gladzah, N.D. (2013). CHALLENGES OF EXCLUSIVE BREASTFEEDING AMONG FEMALE HEALTH WORKERS IN TWO HOSPITALS IN ACCRA. Master Thesis

Glaser, B.G; Strauss, A. L. (1967) *The discovery of grounded theory: strategies for qualitative research*. Chicago.: Aldine

Global Forum for Health Research (2016). Website. Available at: <http://www.globalforumhealth.org/>. Retrieved: February 29, 2016

GOV. UK (2012). Website. Available at: <https://www.gov.uk/>. Retrieved: February 22, 2016

GOV.UK (2016). Website. <https://www.gov.uk/maternity-pay-leave/overview>. 2016

Greenhalgh, T.; Wong, G.; Westhorp, G.; Pawson, R. (2011). Protocol - realist and meta-narrative evidence synthesis: Evolving Standards (RAMESES). *BMC Medical Research Methodology*, 11:115

Grimshaw, J.M.; Russell, T. (1994) Achieving health gain through clinical guidelines I: Developing scientifically valid guidelines. *Quality in Health Care*, 3:45-52

Grimshaw, J.; Thomas, R.; MacLennan, G.; Fraser, C.; Ramsay, C.; Vale, L.; Whitty, P.; Eccles, M.; Matowe, L.; Shirran, L.; Wensing, M.; Dijkstra, R.; Donaldson, C. (2004) Effectiveness and efficiency of guideline dissemination and implementation strategies. *Health Technology Assessment 2004*; Vol. 8: No. 6

Grouven, U.; Bender, R.; Ziegler, A.; Lange, S. (2007). Der Kappa-Koeffizient. Artikel Nr. 23 der Statistik-Serien in der DMW. *Deutsche Medizinische Wochenschrift*, 132:e65-e68

GSS, GHS, ICF International (2015). Ghana Statistical Service, Ghana Health Service, and ICF International. Ghana. Demographic and Health Survey 2014. Rockville, Maryland, USA. 2014

GSS (2015). Ghana Statistical Service. Website. Available at: <http://www.statsghana.gov.gh/>. Retrieved: February 23, 2016

Gyimah, S. O. (2009). Polygynous marital structure and child survival in sub-Saharan Africa: Some empirical evidence from Ghana. *Social Science & Medicine*, 68, 2, pp 334-342

Higgins, J.P.T.; Altman, D.G. (eds). (2008) Chapter 8: Assessing risk of bias in included studies. In: Higgins, J.P.T.; Green, S. (eds). *Cochrane Handbook for Systematic Reviews of Interventions*. Chichester (UK): John Wiley & Sons

Higgins, J.P.T.; Deeks, J. (eds). (2008) Chapter 7: Selecting studies and collecting data. In: Higgins, J.P.T.; Green, S. (eds). *Cochrane Handbook for Systematic Reviews of Interventions*. Chichester (UK): John Wiley & Sons

Hoddinott, P. (2014). Chair in Primary Care, Health Services Research, University of Stirling. Personal communication

Hölling, H.; Schlack, R.; Petermann, F.; Ravens-Sieberer, U.; Mauz, E.; KiGGS Study Group (2014). Psychische Auffälligkeiten und psychosoziale Beeinträchtigungen bei Kindern und Jugendlichen im Alter von 3 bis 17 Jahren in Deutschland – Prävalenz und zeitliche Trends zu 2 Erhebungszeitpunkten (2003–2006 und 2009–2012). Ergebnisse der KiGGS-Studie – Erste Folgebefragung (KiGGS Welle 1). *Bundesgesundheitsblatt - Gesundheitsforschung - Gesundheitsschutz* 57(7)

Horta, B.; Victora, C. (2013). Long-term effects of breastfeeding. A systematic review. WHO.

Howe, L.D.; Hargreaves, J.R.; Huttly, S. (2008). Issues in the construction of wealth indices for the measurement of socio-economic position in low-income countries. *Emerging Themes in Epidemiology*, 5:3

HSCIC (2011). Health and Social Care Information Centre. CHILDREN'S BMI, OVERWEIGHT AND OBESITY. HSE: VOL1, CHAPTER 11. Available at: <https://catalogue.ic.nhs.uk/publications/public-health/surveys/health-surv-eng-2011/HSE2011-Ch11-Child-obesity.pdf>. Retrieved: August 11, 2013

HSCIC (2016). Health and Social Care Information Centre. Maternity Statistics. Website. Available at: <http://www.hscic.gov.uk/searchcatalogue?q=%22nhs+maternity+statistics%22&size=10&topics=0%2FHospital+care>. Retrieved: February 22, 2016

Hwang, W.; Chung, W., Kang, D., Suh, M. (2006). Factors influencing breastfeeding rate and duration. *Journal of Preventive Medicine and Public Health*. Volume 39 (1): 74-80

IBCLC (2016). International Board of Lactation Consultant Examiners®. History. Website. Available at: <http://iblce.org/about-iblce/history/>. Retrieved: March 02, 2016

IBFAN (2016). International Baby Food Action Network. Our history. Website. Available at: <http://ibfan.org/our-history>. Retrieved: February 23, 2016

IEA (2014). International Epidemiological Association. A Dictionary of Epidemiology, 6<sup>th</sup> edition. Oxford University Press. New York, USA

ILCA - International Lactation Consultant Association (2001). Positionspapier: Stillen, Muttermilch und Umweltgifte. Available at: [www.stillkinder.de/pdf/environmental\\_cont\\_de.pdf](http://www.stillkinder.de/pdf/environmental_cont_de.pdf). Retrieved: February, 22, 2016

IOM (2011). Institute of Medicine of the National Academies. Graham, R.; Manchester, M.; Miller Wolman, D.; Greenfield, S.; Steinberg, E. (eds). Clinical Practice Guidelines We Can Trust. The National Academies Press

Issaka, A.; Agho, K.E.; Burns, P.; Page, A.; Dibley, M. (2015). Determinants of inadequate complementary feeding practices among children aged 6–23 months in Ghana. *Journal of Public Health Nutrition, Public Health Nutr.*, Mar;18(4):669-78. Epub 2014 May 20. 2014

Johnson, J. L.; Repta, R. 2012. Sex and gender. Beyond the binaries (2012). In: Oliffe & Greaves (eds.). *Designing and conducting gender, sex and health research*. SAGE

Kanmiki, E.W.; Bawah, A.; Agorinya, I. Achana, F.S.; Awoonor-Williams, J.K.; Oduro, A.; Phillips, J.F.; Akazili, J. (2014). Socio-economic and demographic determinants of under-five mortality in rural northern Ghana. *BMC International Health and Human Rights*, 14:24

Katz Rothman, B. (2008) New breast milk in old bottles. *International Breastfeeding Journal*, 3:9

Keller, H.; Demuth, C. (2006). Further Explorations of the "Western Mind." Euro-American and German Mothers' and Grandmothers' Ethnotheories. *FORUM: QUALITATIVE SOCIAL RESEARCH/SOZIALFORSCHUNG.*, Volume 7, No. 1, Art. 5

Kickbusch, I. (2001). Health literacy: addressing the health and education divide. *Health Promotion International*. Vol. 16, No. 3. Oxford University Press

Kopp, I. (2011). Von Leitlinien zur Qualitätssicherung. *Bundesgesundheitsblatt*. 54:160–165

Kramer, M.; Kakuma, R. (2012). Optimal duration of exclusive breastfeeding. Wiley, the Cochrane Collaboration

Kramer, M.; Kakuma, R. (2012). Optimal duration of exclusive breastfeeding. Wiley, the Cochrane Collaboration

Krawinkel M.B. (2011). Benefits from longer breastfeeding: do we need to revise the recommendations? *Curr Probl Pediatr Adolesc Health Care*, Oct;41(9):240-3.

Krieger, N. (2008). Proximal, Distal, and the Politics of Causation: What's Level Got to Do With It? *American Journal of Public Health*, Vol 98, No. 2

Kromrey, H.; Strübing (2009). *J. Empirische Sozialforschung: Modelle und Methoden der standardisierten Datenerhebung und Datenauswertung Taschenbuch – 2009*, von Helmut Kromrey (Hg) . 12 Auflage. Lucius und Lucius Verlagsgesellschaft mbH, Stuttgart

Kroth, Carina (1998). *Stillen und Stillberatung*. Ullstein Medical Verlag, Wiesbaden

La Leche League International (2016). Website. Available at: <http://www.llli.org/ab.html?m=1>. Retrieved: February 24, 2016

Laar, S.A.; Govender, V. (2011). Factors influencing the choices of infant feeding of HIVpositive mothers in Southern Ghana: The role of counsellors, mothers, families and socio-economic status. *Journal of AIDS and HIV Research* Vol. 3(7), pp. 129-137

Labbok, M.H. (2008). Transdisciplinary breastfeeding support: Creating program and policy synergy across the reproductive continuum. *International Breastfeeding Journal*, 3:16

LABOUR ACT - 2003 (ACT 651). Section - 57 - Maternity, Annual and Sick Leave. Available at: [http://laws.ghanalegal.com/acts/id/162/section/57/Maternity,\\_Annual\\_And\\_Sick\\_Leave](http://laws.ghanalegal.com/acts/id/162/section/57/Maternity,_Annual_And_Sick_Leave). Retrieved: February 23, 2016

Lampert T.; Kroll, L.E.; von der Lippe, E.; Müters, S.; Stolzenberg, H. (2013). Sozioökonomischer Status und Gesundheit. Ergebnisse der Studie zur Gesundheit Erwachsener in Deutschland (DEGS1). *Bundesgesundheitsbl* 56:814–82, Springer-Verlag Berlin Heidelberg

Lange C.; Schenk, L.; Bergmann, R. (2007). Distribution, duration and temporal trend of breastfeeding in Germany. Results of the German Health Interview and Examination Survey for Children and Adolescents. (KiGGS)

Lawrence, R.A.; Lawrence, R.M. (2011). Breastfeeding: A Guide for the Medical Profession. Elsevier Mosby, Maryland Heights, MI, USA

Lawrence, R. Breastfeeding barriers revisited (2014). Breastfeeding Medicine. Volume 9, Number 1

Lawton, R.; Ashley, L.; Dawson, S.; Waiblinger, D.; Conner, M. (2012). Employing an extended Theory of Planned Behaviour to predict breastfeeding intention, initiation, and maintenance in White British and South-Asian mothers living in Bradford. *British Journal of Health Psychology*, 17, 854–871

LDK. Degano-Kieser, L. (2015). Second appraiser for Ghana (guidelines). Dr. med, MPH, mental public health expert

Lefebvre, C.; Manheimer, E.; Glanville, J. (2008). Chapter 6: Searching for studies. In: Higgins, J.P.T.; Green, S. (eds.). *Cochrane Handbook for Systematic Reviews*. Wiley

Libuda, L.; Stimming, M.; Mesch, C.; Warschburger, P.; Kalhoff, H.; Koletzko, B.V.; Kersting, M. (2014). Frequencies and demographic determinants of breastfeeding and DHA supplementation in a nationwide sample of mothers in Germany. *Eur J Nutr*, 53:1335–1344

Liese, A. D.; Hirsch, T.; von Mutius, E.; Weiland, S. K. (2006). Burden of overweight in Germany: prevalence differences between former East and West German children, *European Journal of Public Health*, Vol. 16, No. 5, 526–531

Marmot, M.; Wilkinson, R.G. (1999). Oxford, Oxford University Press

Marmot, M.; Allen, J. (2014). Social Determinants of Health Equity. *Am J Public Health*, 104 (Suppl 4): S517–S519.

McMahon, T.; Ward, P.R. (2012). HIV among immigrants living in high-income countries: a Realist Review of evidence to guide targeted approaches to behavioral prevention. *Systematic Reviews*, 1:56

McAndrew, F.; Thompson, J.; Fellows, J.; Large, A.; Speed, M.; Renfrew, M.J. (2012). Infant Feeding Survey. IFF Research, Health and Social Care Information Centre

McCormack, B.; Rycroft-Malone, J.; DeCorby, K.; Hutchinson, A.M.; Bucknall, T.M.; Kent, B.; Schultz, A.; Snelgrove-Clarke, E.; Stetler, C.; Titler, M.; Wallin, L.; Wilson, V. (2013). A Realist Review of interventions and strategies to promote evidence-informed healthcare: a focus on change agency. *Implementation Science*, 8:107

Medela (2016). Website. Available at: <https://www.medela.de/unternehmen>. Retrieved: May 30, 2016

Menzel, G. (2014). Senior librarian at Charité Universitätsmedizin and in charge of supervising the development of search strategies

Merton, R. (1968). *Social theory and Social Structure*. enlarged edition. The Free Press, a Corporation

Mikkonen, Juha; Raphael, D. (2010). *Social Determinants of Health: The Canadian Facts*. Toronto: York University School of Health Policy and Management

MoH Ghana (2008). NATIONAL GUIDELINES FOR PREVENTION OF MOTHER TO CHILD TRANSMISSION OF HIV. Available at: <http://www.ghan aids.gov.gh/gac/docs/GUIDELINES%20%20National%20Guidelines%20for%20Prevention%20of%20Mother%20to%20Child%20Transmission%20of%20HIV%20%202008%20%20MoH.pdf>. Retrieved: August 11, 2013

MoH Ghana (2009). Under Five's Child Health Strategy 2007-2015. Available at: <http://ghanamedicalassociation.org/Documents/Child%20Health%20Strategy.pdf>. Retrieved: August 12, 2013

Mori, C.; Todaka, E. (2011). *Environmental Contaminant's and Children's Health. Sustainable Health Science for Future Generations*. Maruzen Planet Co.,Ltd.

Mulderrig, J. (2007). *Equalities and Human Rights: key concepts and issues*, Edinburgh: University of Edinburgh. Available at: <http://www.creid.ed.ac.uk/projects>. Retrieved: March 03, 2016

Nehlsen, E. (2014). Founder and academic director of the Training Center for Lactation and Breastfeeding. Personal communication

Neuhauser, H.; Poethko-Müller, C.; KiGGS Study Group (2014). Chronische Erkrankungen und impfpräventable Infektionserkrankungen bei Kindern und Jugendlichen in Deutschland.

Ergebnisse der KiGGS-Studie – Erste Folgebefragung (KiGGS Welle 1) Bundesgesundheitsblatt - Gesundheitsforschung - Gesundheitsschutz 57(7)

Neuman, W. L. (2011). Social research methods: Qualitative and quantitative approaches (7th ed.). Pearson, USA

NHIS (2016). National Health Insurance Scheme Ghana. Website. Available at: <http://www.nhis.gov.gh/benefits.aspx>. Retrieved: February 23, 2016

NHS (2012a). National Health System. Antenatal classes. Website. Available at: <http://www.nhs.uk/Conditions/pregnancy-and-baby/Pages/antenatal-classes-pregnant.aspx#close>. Retrieved: May 21, 2014

NICE (2012b). National Institute of Clinical Excellence. Positively equal. A guide to addressing equality issues in developing NICE clinical guidelines. Second edition

NICE (2014). National Institute of Clinical Excellence. Maternal and child nutrition. NICE guideline [PH 11]. Available at: <https://www.nice.org.uk/guidance/ph11> Retrieved: August 11, 2013, and April 04, 2015

NICE (2015a). National Institute of Clinical Excellence. Postnatal Care up to 8 weeks after birth. NICE guidelines [CG 37]. Available at: <https://www.nice.org.uk/guidance/cg37/chapter/1-recommendations#planning-the-content-and-delivery-of-care>. Retrieved: August 11, 2013, and April 04, 2015

NICE (2015b). National Institute of Clinical Excellence. Types of guidelines. Website. Available at: <http://www.nice.org.uk/About/What-we-do/Our-Programmes/NICE-guidance/NICE-guidelines/NICE-public-health-guidelines>. Retrieved: February 24, 2016

NHS (2016). National Health System. Your health, your choices. Benefits of breastfeeding. Website. Available at: <http://www.nhs.uk/Conditions/pregnancy-and-baby/Pages/benefits-breastfeeding.aspx>. Retrieved: February 22, 2016

NISRA (2014). Northern Ireland Statistics and Research Agency. Website. Available at: <http://www.nisra.gov.uk/demography/default.asp99.htm>. Retrieved: February 22, 2016

NS. Stone, N. (2014/15). Second reviewer for the United Kingdom (Realist Review). Master of Science in Public Health, PhD candidate in Midwifery Science at the University of Central Lancashire, United Kingdom

Oakley L.L.; Renfrew, M.J.; Kurinczuk, J.J.; Quigley, M.A. (2013). Factors associated with breastfeeding in England: an analysis by primary care trust. *BMJOpen*, 3

Oakley, L.L.; Henderson, J.; Redshaw, M.; Quigley, M.A. (2014). The role of support and other factors in early breastfeeding cessation: an analysis of data from a maternity survey in England. *BMC Pregnancy and Childbirth*, 14:88

Ochsmann, E. (2007). In: *Grundwissen Klinische Umweltmedizin. Querschnittsbereich 6*. Verlag Hans Huber

Okechukwu, C.; Davison, K.; Emmons, K. (2014). Changing Health Behaviors in a Social Context. *Social epidemiology*, second edition. In: Berkman, L.F.; Kawachi, I.; Glymour, M.M. (eds.). Oxford University Press

Oliver S.; Kavanagh, J.; Caird, J.; Lorenc, T.; Oliver, K.; Harden A. (2008). Health promotion, inequalities and young people's health. A systematic review of research. EPPI-Centre. Available at: <http://eppi.ioe.ac.uk/cms/Default.aspx?tabid=2410&language=en-US>. Retrieved: February 29, 2016

ONS (2009). Office for National Statistic. Multivariate Analysis of infant death in England and Wales in 2005-2006, with focus on socio-economic status and deprivation. ONS (ed)

ONS (2010). Office for National Statistics, 2010. The National Statistics Socio-economic Classification (NS-SEC rebased on the SOC2010). Website. Available at: <http://www.ons.gov.uk/ons/guide-method/classifications/current-standard-classifications/soc2010/soc2010-volume-3-ns-sec--rebased-on-soc2010--user-manual/index.html#3>. Retrieved May 03, 2014.

ONS (2011). Office for National Statistics. Atlas of Deprivation 2010. Available at: <http://neighbourhood.statistics.gov.uk/HTMLDocs/AtlasOfDeprivation2010/index.html>. Retrieved May 04, 2014

ONS (2014). Office for National Statistics. Ethnic group: guidance and methodology. Website. Retrieved May 04, 2014. Available at: <http://www.ons.gov.uk/ons/guide-method/measuring-equality/equality/ethnic-national-identity-religion/ethnic-group/index.html#top>

Opoku, D. (2014). Personal communication. Alumnus of the Master Program: Health and Society: Gender and Diversity Studies

Otoo, G.E.; Lartey, A.A.; Pérez-Escamilla, R. (2009). Perceived Incentives and Barriers to Exclusive Breastfeeding Among Periurban Ghanaian Women. *J Hum Lact* 25(1)

PAHO (2007). Pan American Health Organization. Beyond Survival: Integrated delivery care practices for long-term maternal and infant nutrition, health and development. Washington, D.C.: PAHO

Patel, R.; Oken, E.; Bogdanovich, N.; Matush, L.; Sevkovskaya, Z.; Chalmers, B.; Hodnett, E.D. Vilchuck, K.; Kramer, M.; Martin, R. (2013). Cohort Profile: The Promotion of Breastfeeding Intervention Trial (PROBIT). *International Journal of Epidemiology*, 1–12

Pawson, R., Greenalgh, T.; Harvey, G.; Walshe, K. (2004). Realist Synthesis: an introduction. ESRC Research Methods Programme, University of Manchester. RMP Methods Paper 2/2004

Pawson, R.; Greenalgh, T.; Harvey, G.; Walshe, K. (2005). Realist Review – a new method of systematic review designed for complex policy interventions. *Journal of Health Services Research & Policy*, Vol. 10, Suppl. 1, pp. 21-34

Pawson, R. (2006). Evidence-based policy. A realist perspective. SAGE

Pfaff, H.; Schrappe, M. Einführung in die Versorgungsforschung. In: Neugebauer, E. Glaeske, G.; Schrappe, M. (Hg). *Lehrbuch Versorgungsforschung. Systematik-Methodik-Anwendung*. Schattauer GmbH, Stuttgart. 2011

Pflüger, M.; Winkler, C.; Hummel, S.; Ziegler, A.G. (2010). Early Infant Diet in Children at High Risk for Type 1 Diabetes. *Horm Metab Res*, 42: 143 – 148

PMNCH (2011). The Partnership for Maternal, Newborn and Child Health. Fact Sheet: RMNCH Continuum of care. Available at: [http://www.who.int/pmnch/about/continuum\\_of\\_care/en/](http://www.who.int/pmnch/about/continuum_of_care/en/). Retrieved: February 24, 2016

Politi, M.C., Wolin, K.Y.; Légaré, F. (2013) Implementing Clinical Practice Guidelines About Health Promotion and Disease Prevention Through Shared Decision Making. *J Gen Intern Med* 28(6):838–44

Polus, S.; Lerberg, P.; Vogel, J.; Watananirun, K.; Souza, J.P.; Mathai, M.; Gülmezoglu, M. (2012). Appraisal of WHO Guidelines in Maternal Health Using the AGREE II Assessment Tool. Paul Garner, Editor *PLoS One*; 7(8): e38891. Pub-

lished online 2012 Aug 13. Available at: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3418264/>. Retrieved: April 28, 2016

Powers, M.; Faden, R. (2006). *Social Justice: the moral foundations of public health and health policy*. Oxford University Press. New York.

Präventionsgesetz (2015). Neuerungen des SGB durch das Präventionsgesetz, SGB V, § 24d, Absatz 1: Ärztliche Betreuung und Hebammenhilfe. Available at: <http://www.praevges.info/%C2%A7-24d-aerztliche-betreuung-und-hebammenhilfe/>. Retrieved: February 22, 2016

QUAG (2014). Gesellschaft für Qualität in der außerklinischen Geburtshilfe. Available at: <http://www.quag.de/>. Retrieved: February 22, 2016

Quigley, M.A.; Kelly, Y.J.; Sacker, A. (2007). Breastfeeding and hospitalization for diarrheal and respiratory infection in the UK Millennium Cohort Study. *Pediatrics*, 119, e837-842.

Random House Information Group (1997). *The Random House Thesaurus*. College Edition. New York

Rebhan B.; Kohlhuber M.; Schwegler, U.; Koletzko, B.; Fromme, H. (2008). Stillfrequenz und Stillprobleme– Ergebnisse der Bayerischen Stillstudie. *Gesundheitswesen* 70:S8–S12

Redshaw M, Heikkila K. (2010). *Delivered with care: A national survey of women's experience of maternity care 2010*. Oxford: National Perinatal Epidemiology Unit, University of Oxford

RKI (2012). Robert Koch-Institut (Hrsg). *Stillverhalten. Faktenblatt zu KiGGS Welle 1: Studie zur Gesundheit von Kindern und Jugendlichen in Deutschland – Erste Folgebefragung 2009 – RKI, Berlin, 2015*

Roberts, T; Carnahan, E.; Gakidou, E. (2013). Can breastfeeding promote child health equity? A comprehensive analysis of breastfeeding patterns across the developing world and what we can learn from them. *BMC Medicine*, 11:254

Rollins, N.; Bhandari, N.; Hajeebhoy, N.; Horton, S.; Lutter, C.; Martines, J.; Piwoz, E.; Richter, L.; Victora, C. on behalf of The Lancet Breastfeeding Series Group (2016). Why invest, and what it will take to improve breastfeeding practices? *Lancet* 2016; 387: 491–504

Rouw, E.; Hormann, E.; Scherbaum, V. (2014). The high cost of half-hearted breastfeeding promotion in Germany. *International Breastfeeding Journal*, 9:22

Diez Roux, A. (2012). Conceptual Approaches to the Study of Health Disparities. *Annu Rev Public Health*. April ; 33: 41–58

Royal Pharmaceutical Society (2011). *Pharmacy Research and Evaluation Resource, Series Two: Conducting an Evidence/Literature Review*

Ryan, K.; Smith, L.; Alexander, J. (2013). When baby's chronic illness and disability interfere with breastfeeding: Women's emotional adjustment *Midwifery* 29, 794–800

Rycroft-Malone, J.; McCormack, B.; Hutchinson, A.M.; DeCorby, K.; Bucknall, T.K.; Kent, B.; Schultz, A.; Snelgrove-Clarke, E.; Stetler, C.B.; Titler, M.; Wallin, L.; Wilson, V. (2012). Realist Synthesis: illustrating the method for implementation research. *Implementation Science*, 7:33

Sagoe-Moses, I. (2014). National Coordinator of GHS Child Health, Ministry of Health, Ghana. Personal Communication.

Schenk, L.; Bau, A.-M.; Borde, T.; Butler, J.; Lampert, T.; Neuhauser, H.; Razum, O.; Weilandt, C. (2006). Mindestindikatoren zur Erfassung des Migrationsstatus. Empfehlungen für die epidemiologische Praxis. *Bundesgesundheitsbl - Gesundheitsforsch - Gesundheitsschutz* 49:853–860

Schlaud, M.; Atzpodien, K.; Thierfelder, W. (2007). Allergische Erkrankungen. *Bundesgesundheitsblatt-Gesundheitsforschung-Gesundheitsschutz*, 50: 701-710

Schmitz, R.; Thamm, M.; Ellert, U. Kalcklösch, M.; Schlaud, M.; KiGGS Study Group (2014). Verbreitung häufiger Allergien bei Kindern und Jugendlichen in Deutschland. Ergebnisse der KiGGS-Studie – Erste Folgebefragung (KiGGS Welle 1) *Bundesgesundheitsblatt - Gesundheitsforschung – Gesundheitsschutz*

Schünemann H.J.; Fretheim, A.; Oxman, A.D. (2006). Improving the use of research evidence in guideline development:1. Guidelines for guidelines. *Health Research Policy and Systems*, 4:13

Schünemann, H.J.; Wiercioch, W.; Itziaz Etxeandia, I.; Falavigna, M.; Santesso, N.; Mustafa, R.; Ventresca, M.; Brignardello-Petersen, R.; Laisaar, K.-T.; Kowalski, S.; Baldeh, T.; Zhang, Y.; Raid, U.; Neumann, I.; Norris, S.L.; Thornton, J.;

Harbour, R.; Treweek, S.; Guyatt, G.; Alonso-Coello, P.; Rezap, M.; Brožek, J.; Oxman, A.; Akl, A.E. (2014). Guidelines 2.0: systematic development of a comprehensive checklist for a successful guideline enterprise. *CMAJ*, February 18, 186(3)

SIGN (2014). Scottish Intercollegiate Guideline Network methodological checklist. Available at: <http://www.sign.ac.uk/methodology/checklists.html>. Retrieved: February 12, 2015.

Senarath, U.; Godakandage, S.S.; Jayawickrama, H.; Siriwardena I.; Dibley, M.J. (2012). Determinants of inappropriate complementary feeding practices in young children in Sri Lanka: secondary data analysis of Demographic and Health Survey 2006-2007. *Maternal and Child Nutrition*, 1, 60-77

Shi C.; Tian, J.; Wang, Q.; Petkovic, J.; Ren, D.; Yang, K.; Yang, Y. (2014). How equity is addressed in clinical practice guidelines: a content analysis. *BMJ Open*, 4

SHUAIB, F.; JOLLY, P. E.; EHIRI, J. E.; ELLIS, W. O.; YATICH, N. J.; FUNKHOUSER, E.; PERSON, S.D.; WILLIAMS, J. H.; QIAN, G.; WANG, J-S. (2012). SOCIO-DEMOGRAPHIC DETERMINANTS OF AFLATOXIN B1-LYSINE ADDUCT LEVELS AMONG PREGNANT WOMEN IN KUMASI, GHANA. *Ghana Medical Journal*, Volume 46, Number 4

Shuaib, F.; Jolly, P.E.; Ehiri, J.E.; Yatich, N.; Jiang, Y.; Funkhouser, E.; Person, S.D.; Wilson, C.; Ellis, W.O.; Wang, J-S.; WILLIAMS, J. H. 2009. (2010). Association between birth outcomes and aflatoxin B1 biomarker blood levels in pregnant women in Kumasi, Ghana, *Tropical Medicine and International Health*, Volume 15 no 2 pp 160–167

Siegrist, J. (2002). Effort-reward Imbalance at Work and Health. In Perrewe, P. and Ganster, D. (eds.), *Research in Occupational Stress and Well Being*, Vol. 2: Historical and Current Perspectives on Stress and Health, New York: JAI Elsevier, pp. 261–291

Siering, U.; Diekmann, S.; Rüter, A. (2015). Ist die Evidenzgrundlage von Leitlinienempfehlungen nachvollziehbar? Eine Analyse aktueller evidenzbasierter Leitlinien. Meeting abstract, EbM zwischen Best Practice und inflationärem Gebrauch. 16. Jahrestagung des Deutschen Netzwerks Evidenzbasierte Medizin. Berlin, 13.-14.03.2015. Düsseldorf: German Medical Science GMS Publishing House. Available at: <http://www.egms.de/static/en/meetings/ebm2015/15ebm096.shtml>. Retrieved: March 20, 2016

Sittlington, J.; Stewart-Knox, B.; Wright, M.; Bradbury, I.; Scott, J.A. (2007). Infant-feeding attitudes of expectant mothers in Northern Ireland. *HEALTH EDUCATION RESEARCH*. 22,4, 561–570

Skafida, V. (2012). Juggling Work and Motherhood: The Impact of Employment and Maternity Leave on Breastfeeding Duration: A Survival Analysis on Growing Up in Scotland Data. *Matern Child Health J* 16:519–527

Soto-Ramírez, N.; Karmaus, W. (2008). The use of oral contraceptive before pregnancy and breastfeeding duration: A cross-sectional study with retrospective ascertainment. *International Breastfeeding Journal*, 3:29

Springer, S. (1997). Stillen in den ersten Lebenstagen - Ist eine Ergänzung notwendig? Ausbildungsunterlagen IBCLC, Zentrum für Laktation und Stillen

Statistisches Bundesamt (2010). Fachserie 1, Reihe 2.2 Bevölkerung und Erwerbstätigkeit, Bevölkerung mit Migrationshintergrund, Wiesbaden

Statistisches Bundesamt (2014). Glossar. Available at: [https://www.destatis.de/DE/ZahlenFakten/GesellschaftStaat/Bevoelkerung/MigrationIntegration/Glossar\\_MigrationIntegration.html;jsessionid=107D598E7869FB75215E5ACB34AB0437.cae3](https://www.destatis.de/DE/ZahlenFakten/GesellschaftStaat/Bevoelkerung/MigrationIntegration/Glossar_MigrationIntegration.html;jsessionid=107D598E7869FB75215E5ACB34AB0437.cae3). Retrieved: May 03, 2014

Statistisches Bundesamt, Wiesbaden (2016). Available at: <https://www.destatis.de/DE/ZahlenFakten/GesellschaftStaat/Bevoelkerung/Bevoelkerung.html>. Retrieved: February 22, 2016

Steinkamp, G. (1999): Soziale Ungleichheit in Mortalität und Morbidität. Oder: Warum einige Menschen gesünder sind und länger leben als andere. In: Schlicht, W., Dickhuth, H.H. (Hrsg.): *Gesundheit für alle. Fiktion oder Realität*. Stuttgart, New York: Schattauer Verlag: 101- 154

Street, A. F. (1992) *Inside nursing. A Critical Ethnography of Clinical Nursing Practice*. Albany: State University of New York Press. In: Dykes, F. 2006. *BREASTFEEDING IN HOSPITAL. MOTHERS; MIDWIVES AND THE PRODUCTION LINE*. Routledge Taylor and Francis Group, LONDON AND NEW YORK.

Stuebe, A. (2009). The risks of not breastfeeding for mothers and infants. *REVIEWS IN OBSTETRICS & GYNECOLOGY*. VOL. 2 NO. 4, pp. 222-231

Šumilo D; Kurinczuk JJ; Redshaw ME, Gray, R. (2013). Association between limiting longstanding illness in mothers and their children: findings from the UK. Millennium Cohort Study. *BMJ. Open*

Sun movement (2015). Website. Available at: <http://scalingupnutrition.org/sun-countries/ghana>. Retrieved: February 23, 2016

Tampah-Naah, A. (2014). Researcher at the University for Development Studies/University of Tamale. Personal communication

Tampah-Naah, A.; Kumi-Kyereme, A. (2013). Determinants of exclusive breastfeeding among mothers in Ghana: a cross-sectional study. *Breastfeeding Journal*, 8:13

Tarlov, A. (1996). Social determinants of health: the sociobiological translation. In: Blane, D.; Brunner, E.; Wilkinson, R. (eds). *Health and social organization*. London: Routledge

Tawiah-Agyemang, C.; Kirkwood, B.R.; Edmond, K.; Bazzano, A.; Hill, Z. (2008). Early initiation of breast-feeding in Ghana: barriers and facilitators. *Journal of Perinatology*, 28, S46–S52

Tawiah-Agyemang, C. (2014). Researcher at the Kintampo Health Research Center and reproductive health expert. Personal communication

The INCLIN Trust (2016). Website. Available at: <http://inclitrust.org/inclen/page.php?id=185>. Retrieved: February 29, 2016

The World Bank (2016). Mortality rate, under-5 (per 1,000). Website. Available at: <http://data.worldbank.org/indicator/SH.DYN.MORT>. Retrieved: February 22, 2016

Thesaurus.com (2014). Website. Available at: <http://www.thesaurus.com/>. Retrieved: March to June, 2014

Tugwell, P.; de Savigny, D.; Hawker, G.; Robinson, V. (2006). Applying clinical epidemiological methods to health equity: the equity effectiveness loop. *BMJ* 332:358–61

UN (2011). United Nations. Gender Influences on Child Survival, Health and Nutrition: A Narrative Review. United Nations Children's Fund (UNICEF). Available at: [https://www.unicef.org/gender/files/Gender\\_Influences\\_on\\_Child\\_Survival\\_a\\_Narrative\\_review.pdf](https://www.unicef.org/gender/files/Gender_Influences_on_Child_Survival_a_Narrative_review.pdf). Retrieved: 24 February, 2016

UN (2015). United Nations. United Nations Sustainable Development Summit 2015. Available at: <https://sustainabledevelopment.un.org/content/documents/21252030%20Agenda%20for%20Sustainable%20Development%20web.pdf>. Retrieved: 24 February, 2016

UNICEF UK (2010). United Nations Children Fund. The Baby Friendly Initiative. Available at: <http://www.unicef.org.uk/babyfriendly/>. Retrieved: February 22, 2016

UNICEF UK (2012). United Nations Children Fund United Kingdom. Preventing disease and saving resources: the potential contribution of increasing breastfeeding rates in the UK

UNICEF UK (2016). United Nations Children Fund United Kingdom. The Baby Friendly Initiative. Baby Friendly Statistics 2016. Website. Available at: <http://www.unicef.org.uk/BabyFriendly/About-Baby-Friendly/Awards/Baby-Friendly-statistics>. Retrieved: February 24, 2016

UNICEF (2005). United Nations Children Fund. Innocenti Declaration. Available at: [http://www.unicef.org/nutrition/files/innocenti2005m\\_FINAL\\_ARTWORK\\_3\\_MAR.pdf](http://www.unicef.org/nutrition/files/innocenti2005m_FINAL_ARTWORK_3_MAR.pdf). Retrieved: February 23, 2016

UNICEF (2011). United Nations Children Fund. Infant and young child feeding. Programming guide. Available at: [http://www.unicef.org/nutrition/files/Final\\_IYCF\\_programming\\_guide\\_2011.pdf](http://www.unicef.org/nutrition/files/Final_IYCF_programming_guide_2011.pdf). Retrieved: August 10, 2013

UNICEF (2012). United Nations Children Fund. Countdown to Zero. Elimination of New HIV Infections Among Children by 2015 And Keeping Their Mothers Alive. UNICEF (ed.). Available at: [http://files.unaids.org/en/media/unaids/contentassets/documents/unaidspublication/2011/20110609\\_JC2137\\_Global-Plan-Elimination-HIV-Children\\_en.pdf](http://files.unaids.org/en/media/unaids/contentassets/documents/unaidspublication/2011/20110609_JC2137_Global-Plan-Elimination-HIV-Children_en.pdf). February 23, 2016

UNICEF (2015). United Nations Children's Fund. Levels and trends in child mortality. Report 2015. Estimates developed by the Inter-agency Group for Child Mortality Estimation (UN IGME). Available at: [http://www.childmortality.org/files\\_v20/download/igme%20report%202015%20child%20mortality%20final.pdf](http://www.childmortality.org/files_v20/download/igme%20report%202015%20child%20mortality%20final.pdf). Retrieved: 24 February, 2016

UNICEF (2016). United Nations Children Fund. 1000 Days Product. Scaling-Up Nutrition Movement. Website. Available at: <http://www.unicefstories.org/model/1000days/>. Retrieved: 24 February, 2016

UNICEF; WHO (2006). United Nations Children Fund; World Health Organization. BFHI: Revised and updated materials, 2006. Available at: [http://www.unicef.org/nutrition/files/BFHI\\_Revised\\_Section1.pdf](http://www.unicef.org/nutrition/files/BFHI_Revised_Section1.pdf). Retrieved: February 28, 2016

Victora, C.; Bahl, R.; Barros, A.; França, G.; Horton, S.; Krasevec, J.; Murch, S.; Sankar, M. J.; Walker, N.; Rollins, N. for The Lancet Breastfeeding Series Group. (2016). Breastfeeding in the 21st century: epidemiology, mechanisms, and lifelong effect. *Lancet* 2016; 387: 475–90, Vol. 1, No. 1

Von der Lippe, E.; Brettschneider, A.-K.; Gutsche, J.; Poethko-Müller, C.; KiGGS Study Group (2014). Einflussfaktoren auf Verbreitung und Dauer des Stillens in Deutschland. Ergebnisse der KiGGS-Studie – Erste Folgebefragung (KiGGS Welle 1). Abteilung für Epidemiologie und Gesundheitsmonitoring, Robert Koch-Institut, Berlin, Springer-Verlag Berlin Heidelberg. *Bundesgesundheitsbl* 57:849–859

Von der Lippe (2016). Personal communication at Congress of Poverty and Health, TU Berlin, 2016

WBTi (2014). World Breastfeeding Trends Initiative (WBTi). The Guide Book. Available at: <http://worldbreastfeedingtrends.org/GenerateReports/docs/WBTi-Guide-Book-2014.pdf>. Retrieved: February 24, 2016

Wehrstedt, C. (2013). AN EXPLORATORY STUDY INTO WOMEN'S RATIONALE FOR BREASTFEEDING BEYOND INFANCY. Master Thesis

Weißborn, A. (2009). Drei Studien über das Stillverhalten von Berliner Müttern als Beitrag zur Einrichtung eines Stillmonitorings in Deutschland. DISSERTATION

Werner, D.; Sanders, D. (1997). QUESTIONING THE SOLUTION: The Politics of Primary Health Care and Child Survival *with an in-depth critique* of ORAL REHYDRATION THERAPY. HEALTH WRIGHTS, Workgroup for People's Health and Rights. Palo Alto, CA, USA

Whitehead, M. (1993). The concepts and principles of equity and health. World Health Organization Regional Office for Europe, Copenhagen

WHO Bulletin (2010). Volume 88, Number 1, January 2010, 1-80, Breast is best.

WHO (1981). World Health Organization. International Code of Marketing of Breast-milk Substitutes Available at: [http://www.who.int/nutrition/publications/code\\_english.pdf](http://www.who.int/nutrition/publications/code_english.pdf). Retrieved: February 23, 2016

WHO (1989). World Health Organization. Protecting, promoting and supporting breastfeeding: the special role of maternity services. Available at: <http://apps.who.int/iris/bitstream/10665/39679/1/9241561300.pdf?ua=1&ua=1>. Retrieved: February 23, 2016

WHO (1990). World Health Organization. Innocenti Declaration. Available at: [http://www.who.int/about/agenda/health\\_development/events/innocenti\\_declaration\\_1990.pdf](http://www.who.int/about/agenda/health_development/events/innocenti_declaration_1990.pdf). Retrieved: February 23, 2016

WHO (2005). World Health Organization. The World Health Report 2005: make every mother and child count. [http://www.who.int/whr/2005/whr2005\\_en.pdf](http://www.who.int/whr/2005/whr2005_en.pdf). Retrieved: February 23, 2016

WHO (2008). World Health Organization. Infant and young child feeding: model chapter for textbooks for medical students and allied health professionals. Available at: [http://apps.who.int/iris/bitstream/10665/44117/1/9789241597494\\_eng.pdf?ua=1&ua=1](http://apps.who.int/iris/bitstream/10665/44117/1/9789241597494_eng.pdf?ua=1&ua=1). Retrieved: February 23, 2016

WHO (2012). World Health Organization. WHO Handbook for Guideline Development. Available at: [http://apps.who.int/iris/bitstream/10665/75146/1/9789241548441\\_eng.pdf?ua=1](http://apps.who.int/iris/bitstream/10665/75146/1/9789241548441_eng.pdf?ua=1). Retrieved: February 23, 2016

WHO (2013a). World Health Organization. Under-five mortality. Global Health Observatory. Available at: [http://www.who.int/gho/child\\_health/mortality/mortality\\_under\\_five\\_text/en/index.html](http://www.who.int/gho/child_health/mortality/mortality_under_five_text/en/index.html). Retrieved: August 09, 2013

WHO (2013b). World Health Organization. Infant mortality. Global Health Observatory. Available at: [http://www.who.int/gho/urban\\_health/outcomes/infant\\_mortality\\_text/en/index.html](http://www.who.int/gho/urban_health/outcomes/infant_mortality_text/en/index.html). Retrieved: August 09, 2013

WHO (2013c). World Health Organization. Breastfeeding. Website. Available at: <http://www.who.int/topics/breastfeeding/en/>. Retrieved: August 09, 2013

WHO (2015a). World Health Organization. Global, regional, and national trends in under-5 mortality between 1990 and 2015, with scenario-based projections to 2030: a systematic analysis by the UN Inter-agency Group for Child Mortality Estimation. *Lancet*; 386: 2275-86

WHO (2015b). World Health Organization. Breastfeeding and Work: Let's Make It Work! Available at: <http://www.who.int/mediacentre/commentaries/breastfeeding/en/>. Retrieved: February 24, 2016

WHO (2016a). World Health Organization. Commission on the Social Determinants of Health 2005 – 2008. Available at: [http://www.who.int/social\\_determinants/thecommission/en/](http://www.who.int/social_determinants/thecommission/en/). Retrieved: January 10, 2016

WHO (2016b). World Health Organization. Factsheet: Children: reducing Mortality. Available at: <http://www.who.int/mediacentre/factsheets/fs178/en/>. Retrieved: February 18, 2016

Wilkinson, R.G.; Marmot, M. (eds), (2003). *Social determinants of health: the solid facts*. 2<sup>nd</sup> edition. Available at: [http://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0005/98438/e81384.pdf](http://www.euro.who.int/__data/assets/pdf_file/0005/98438/e81384.pdf). Retrieved: August 09, 2013

Williamson, I.A.; Sacranie, S.M. (2012). Nourishing body and spirit: exploring British Muslim mothers' constructions and experiences of breastfeeding. *Diversity and Equality in Health and Care*, 9:113–23

Wong, G.; Westhorp; G. Pawson, R.; Greenalgh, T. (2013). *Realist Synthesis*. RAMESES Training Materials. Blizard Institute. Barts and The London School of Medicine and Dentistry. Queen Mary, University of London. Available at: [http://www.ramesesproject.org/media/Realist\\_reviews\\_training\\_materials.pdf](http://www.ramesesproject.org/media/Realist_reviews_training_materials.pdf). Retrieved: July 09, 2013

## **ANNEXES**

The annex consists of four parts A-D. Annex A, B and D are available in electronic format only, as well as annex C 1-2. To increase the understandability of results, annex C3 (study descriptions) and C4 (reporting of data) are attached at the end of this thesis.

### **ANNEX A: SEARCH FOR THE REALIST REVIEW (electronic version)**

Annex A1: Key Expert Interviews for all Countries

Annex A2: Search Protocols by Country

### **ANNEX B: SCREENING OF RESULTS FROM THE SEARCH (electronic version)**

Annex B1: Endnote Libraries by Country and Social Determinant with comments for the 1<sup>st</sup> Screening

Annex B2: Tables with Exclusion Criteria by Country and Social Determinant for the Second and Third Screening

### **ANNEX C: ANALYSIS REALIST REVIEW**

Annex C1: Tables with Data Extraction for Study Descriptions by Country (electronic version)

Annex C2: Tables with Data Extraction for Realist Synthesis by Country (electronic version)

Annex C3: Study descriptions by Country and Study Design (print version, attached to thesis)

Annex C4: Reporting of Data by Country (print version, attached to thesis)

Annex C5: Selected Studies per Country

### **ANNEX D: GUIDELINE ANALYSIS**

Annex D1: AGREE II Appraisals by Country and Guideline (electronic version)

Annex D2: BIAS FREE Analyses by Country and Guideline (electronic version)

Annex D3: Original Versions of Guidelines

## **Annex C3: Study Descriptions by Country and Study Design**

In this part of the annex, the study descriptions with the overall assessment from the annex are described. Information was extracted according to study aim, study population, as for the study design sampling strategy, method of data collection and analysis, the social environment, which social determinants were named, outcome of the study including primary and secondary, funding, comments in regards to reporting and conduct of the study, and finally the overall assessment.

First, studies with a quantitative research design are described, and then one study that employed a qualitative research design.

### **Germany: Study Descriptions of an Observational Study Design**

#### *Bergmann et al., 2002*

In 1990, the German Multicenter Atopy Study (MAS), an observational cohort study, was launched. Bergmann et al. (2002) published results on the relationship of breastfeeding and the development of an atopic disease. The aim of the study was to analyze the effect of any breastfeeding (exclusive and non-exclusive breastfeeding) on the development of atopic eczema from birth to age seven. Data were collected from six randomly selected obstetric wards, and subsequently 1,214 infants including 499 high risk infants for atopic disease included in the study. Participants were recruited through convenience sampling. The breastfeeding indicator was not further specified. Breastfeeding duration was a secondary outcome. Data on breastfeeding were collected during hospital stay and follow-up after months 1, 3, 6, 12, 18, and 24 through a parental questionnaire including questions in combination with a structured interview. The determinants of the breastfeeding period were assessed through multivariate linear regression. For the point of data collection at week 1, breast feeders who had stopped by that point in time and non-breast feeders were grouped together. After the first week, 92% participating mothers were breastfeeding, with about half of them (51%) practicing mixed breastfeeding. After one month, the amount of breast feeders was reduced to 69%, after two months to 62%, after three months to 57%, after four months slightly less than half of all mothers (47%) were still breastfeeding,

after five months the amount was 42% and after 6.5 months only 26% of all participants were still breastfeeding.

In this study, the social determinants maternal age at birth and social status highly influenced breastfeeding duration. Social status was calculated according to educational level, occupation, and income of the parent with the highest contribution to household income, represented through the father's income in 90% of cases. Analysis showed positive and statistically significant relationships between the social determinants older maternal age and higher social status and a prolonged breastfeeding period, without providing more specific information. As for reporting, the study was intelligible, but the study design was not described in detail, referring the reader to another publication for further information. Furthermore, it would have been useful if results were explained more in depth. Regarding the conduct, the infant population was not well defined, and participants of slightly higher social status implying a possible selection bias, which moreover was assessed through that of the father and therefore information was not necessarily accurate. The relationship of social status and breastfeeding duration therefore has to be interpreted with caution. Regarding confounders, from those predefined maternal smoking, parity, and early infant-to-breast contact and of the social determinant gender of infant were taken into account. Four out of seven pre-established confounders and 14 out of 16 social determinants were not addressed. Source(s) of funding were not disclosed. The study quality was rated as 'low'.

*Dulon et al., 2001 & Dulon et al., 2003*

In 1997/98 the "Stillen und Säuglingsernährung" (SuSe) study was conducted by Kersting and Dulon, the first nationwide study on breastfeeding in Germany. Two publications presented below were subject to analysis.

The SuSe study consisted of two components, a cross-sectional one where breastfeeding promotion in German hospitals was assessed and an observational cohort design to determine breastfeeding behavior and differences between the former German Democratic Republic (GDR), also termed "East", and Federal Republic of Germany (FRG) called "West". A total of 177 randomly selected hospitals with obstetric care took part in the study, a response rate of 51%. The se-

lection criteria were healthy term babies (>37-week gestational age, > 2500g birth weight, no admission to neonatal unit), maternal fluency in German, and telephone availability at home. Recruitment was carried out by convenience sampling, and from 3,294 eligible subjects, 56.2% agreed to participate. A telephone interview was conducted 14 (+/-2) days after delivery with 1,717 mothers. In the interview, demographic variables and information on the breastfeeding behavior were collected. According to authors, there was no difference between participants and non-participants regarding age, gender of infant, mode of delivery, parity, and birthweight, but more participant mothers had a higher educational level, were of older age, and were more likely to be primiparae. Questionnaires were answered by 1,487 mothers at the end of the 2nd, 4th, 6th, 9th and 12th month postpartum. Breastfeeding was the primary outcome, assessed as full breastfeeding (exclusive and predominant). If the breastfeeding period took place for less than four months, it was defined as short term breastfeeding, and as long term in case of continuation.

*Dulon et al., 2001*

For this publication, a sample of 1,593 mothers of German origin with 80.3% from the former Western Germany/FRG and 19.7% from former Eastern Germany/GDR was analyzed.

Results in percent were all statistically significant and if not, it is stated otherwise. Regarding general breastfeeding behavior, 88.7% of West and 97.1% East German mothers had started breastfeeding at birth. After two weeks, still three quarters of mothers descending both from West and East Germany practiced breastfeeding only (75.2% and 75.5% respectively), 8.4% of women from the former FRG and 14.3% from the former GDR practiced a mixed form feeding breast milk and formula, and 16.4% as opposed to 10.2% did not breastfeed anymore (overall p-value 0.001). At two months, slightly less than two thirds (60.5%) of West German and half (52%) of East German mothers were breastfeeding only, followed by 10% West German and 15% East German women practicing mixed breastfeeding, whereby 29.5% of West German women compared to 33% East German women had stopped breastfeeding. After four months, still half of the mothers from the FRG and one third from the former GDR were breastfeeding

only, followed by 12.6% West German compared to 18.6% from East German descent who did mixed feeding, and slightly more than one third (38.9%) of women as well as half (48.9%), respectively, had stopped. After half a year, still more West German women had continued to only breastfeed (13.4% in comparison to 9.3% for East German), one third (37.4%) West as opposed to 29.6% East German mothers practiced mixed feeding, and almost half (49.2%) of West German mothers, as well as almost two thirds (61.1%) of East German mothers did not breastfeed anymore. Respective values for month 9 and 12 were statistically not significant.

In regards to maternal age, 89.9% of participants from West Germany and 66.7% participants from East Germany were aged up to 25 years, and 10.1% West German and 33.3% East German mothers above 25 years. Results from the multivariate regression revealed that young mothers  $\leq 25$  years were 3.5 times more likely to breastfeed less than four months compared to mothers older than 25 years [95% CI (2.49; 5.06); s.s.]. Women with a low educational attainment ( $< 10$  years of schooling) had a slightly more than 2.5 times elevated probability for short term breastfeeding compared to women with more years of education [OR 2.67; 95% CI (2.01; 3.55); s.s.]. Mothers who lived as a one-parent family had a likelihood almost three times higher (OR 2.79) to breastfeed for less than four months than married women or those living with their partner [95% CI (1.42; 5.43); s.s.]. One fourth (25.5%) of mothers from the former GDR breastfed short term as opposed to 14.5% from the FRG (s.s.) because they had to return to work for most likely economic and/or cultural reasons. For the social determinant geographical location, East German mothers were twice as likely to breastfeed shortly [95% CI (1.55; 2.60); p-value not stated], and the same applies to social networks, where East German mothers were twice as likely as their Western counterparts to experience negative attitude of their partner [OR 2.16; CI 95% (1.28-3.69; s.s.)]. After adjusting for potential confounders (which were not further specified in the publication), East German descent as a factor for short term breastfeeding was not statistically significant anymore.

Regarding reporting, the study is intelligible, but a more focused presentation of the abundant amount of data and results would have enhanced understandability.

In respect to the conduct, the infant population was well defined. A selection bias occurred due to the low response rate of hospitals, where only every second hospital from the original sample was part of the research, but attrition rate was low (90% of mothers still participated in the study after one year). The inclusion criterion of sufficient command of the German language led to the exclusion of migrant mothers not dominating it, which was further reinforced by the necessity to have a telephone at home. As for confounders, from the pre-established ones three out of six were included in the analysis: early breast-to-infant contact, early pacifier use, and supplementary feeding. Only 6 out of 16 social determinants were addressed. The study conduct was supported financially by the Federal Ministry of Health, and the Danone Institute of Nutrition in charge of data analysis. All authors declared that they had no conflict of interests. The study was rated as 'acceptable'.

*Dulon et al., 2003*

The study design was already described above. In this publication, the aim of the study was to examine long-term breastfeeding success according to the degree of breastfeeding promotion at hospitals that were part of the research. For that purpose, a breastfeeding promotion index based on the 'Ten Steps to Successful Breastfeeding', a strategy issued by WHO and UNICEF to support breastfeeding promotion in maternity services, was analyzed. The social determinants maternal age at birth, maternal educational level, and area of upbringing were tested for their predictor value – whether hospital-associated factors or socio-demographic variables had a stronger influence on short or long term breastfeeding. Hospital-associated factors were breastfeeding promotion in the hospital, hospital size, and geographical location of hospital. The variable geographical location was defined as the geographical location of the hospitals that took part in the study, and area of origin was defined as mother's area of upbringing.

Of participants, 9% were aged below 25, and 91% had an age of 25 and above. The crude OR for maternal age and breastfeeding duration was 4.69 for younger age [CI 95% (2.90; 7.58), and still 3.34 [CI 95% (2.03; 5.49)] compared to older mothers after adjusting for confounders. Socio-demographic confounders were educational level and area of upbringing of the mother and breastfeeding promo-

tion index. Hospital-associated confounders were size and geographical location of the hospital.

Regarding maternal educational level, two thirds (69%) had received up to 10 years of schooling, and one third (31%) held a higher education degree. Mothers with a lower educational level were more than three times more likely to breast-feed short term [OR 3.20; CI 95% (2.52; 3.97)]. As for area of upbringing, 19% of participants descended from the former GDR and 81% from the FRG. Women from East Germany were twice as likely to breastfeed short term compared to West German participants [OR 1.95; CI 95% (1.49–3.89)] and adjusted OR of 2.27 [CI 95% (1.33; 3.89)]. Therefore, the most prominent result was that socio-demographic data were more predictive of breastfeeding behavior than the level of breastfeeding promotion at a hospital.

Regarding reporting, the study was well described and intelligible. As already stated for Dulon et al., 2001, the infant population was well-defined. In regard to for limitations, there was a selection bias due to convenience sampling leading to an overrepresentation of mothers aged above 25, with a low educational level, brought up in West Germany and having delivered in large hospitals located in West Germany as well as due to the selection criterion of German language ability. A recall bias was introduced by the points in time of data collection, starting with 14 days, and then spread over a period of 12 months. Three out of five pre-established confounders: early breast-to-infant contact, early pacifier use, and supplementary feeding were addressed, as well as 13 out of 16 social determinants. Funding was supplied by the German Federal Ministry of Health. The quality of the study was ranked as 'acceptable'.

#### *Soto-Ramírez et al., 2008*

Aim of this observational, cross-sectional study was to investigate whether use of oral contraceptives (OC) before pregnancy reduces the total duration of breastfeeding. Within a 3-year study of school children that started in 1994, parents of 1,091 second grade school children in 18 urban districts were recruited. The study population consisted of 663 breastfeeding mothers of the index school children residing in Hesse, Central Germany. Children that had been adopted were excluded, and no stillbirths prior to the index child had been reported.

Data were collected through face-to-face interviews with mothers, retrospectively ascertaining health and living conditions using a standardized questionnaire (European Studies on Fertility and Subfecundity). Breastfeeding was assessed as yes/no as well as the period of exclusive breastfeeding, defined as feeding no other source of food as well as the total duration of breastfeeding measured in weeks and grouped into none, 0–2 months, 3–5 months, 6–12 months, and more than 12 months. Breastfeeding was the primary outcome.

Median duration of breastfeeding was estimated through descriptive analysis. The social determinants of interest were maternal age and maternal educational level, and their respective effect on breastfeeding assessed by survival analysis.

Around 80% of breastfeeding mothers aged below 20 years had a median duration of breastfeeding for eight weeks. For the age group 20–24 years, 82.4% of mothers had a median duration for 9 weeks and 81.6% of age group 25–29 years were breastfeeding for an average of 12 weeks. Of mothers aged 30 years and above, 80.1% were breastfeeding for an average of 16 weeks.

Around three quarters of breastfeeding women who had received high school or less education breastfed on average for eight weeks and 80% of those with some college education for 12 weeks and 92.6% college graduates and above practiced breastfeeding for an average of 24 weeks. Hazard ratios for mother's age at pregnancy and breastfeeding duration were statistically not significant for all age groups, in contrary to mothers with a maximum of a high school degree who were 1.4 times more likely to stop breastfeeding prior than mothers with a college degree or above [HR 1.40 (1.15, 1.70)].

The study was well described and intelligible. However, the infant population was not clearly defined in regards to gestational age, and the fact that women were interviewed when their children were aged 5-7 years old implies a recall bias enhanced by the cross-sectional study design. Sampling strategy and inclusion criteria were not disclosed, thus a selection bias cannot be determined for sure. Two predefined confounders, smoking during pregnancy and parity were taken into account, and for social determinants two out of 16, maternal age and maternal educational level. The study was authorized and supported by the Ministry of Environment, Energy, Youth, Family and Health, Hesse, Germany. The authors

declare that they have no competing interests. The study quality was rated as 'low'.

Weißborn, A., 2009

This observational, cohort study aimed at evaluating the current status of breastfeeding as well as to identify which factors influence breastfeeding behavior of mothers in Berlin. It took place at two birth clinics - one tertiary care, one secondary care, both with maximum perinatal services. The research was comprised of three sub-studies, but only the first one was relevant for the analysis at stake. Convenience sampling strategy was employed and data were collected at four points in time starting with day 1 – 5 after birth, and follow-ups at month 2, 4 and 6, starting in 2004. Inclusion criteria for study participants on the infant's side were birth weight not less than 2500g and at least 37 weeks of gestation, no admission to a neonatal unit, and in case of multiple births, the mother's first child would be the reference. On the mother's side, inclusion criteria were sufficient command of German as well as no health problem that might impede breastfeeding. For sub-study 1 that was subject to analysis, 2,537 mother-child pairs were eligible, and 1,552 mother-child pairs had been recruited for the interview, from which 351 had to be excluded because of insufficient command of the German language. A total of 1,201 mother-child pairs fitted eligibility criteria, and 807 mother-child pairs consented to participate in the study. At first a personal interview of the mother at the maternity ward was conducted, and subsequently data were collected through three questionnaires from month two to six after birth. The overall response rate was 70%, whereby loss to follow-up was highest in the interval between the personal interview at the obstetric ward and the first questionnaire to answer. The probability to belong to the group of non-responders was significantly elevated for mothers of foreign nationality, below the age of 25 and with no or a low educational level. A descriptive analysis was carried out, followed by a Chi-Square test to identify statistically significant variables for breastfeeding duration of up to four and six months, which then entered a regression analysis. The following social determinants were subject to research: maternal age, maternal educational level, one-parent family, male gender of infant, and social networks. Breastfeeding was divided into the exclusive breastfeeding, pre-

dominant, full breastfeeding and complementary feeding according to WHO definition and breastfeeding was the primary outcome of the study.

Mothers younger than 25 years had an OR of 5,28 [(CI 95% 2,99; 9,36); s.s.] to breastfeed for less than four months and were four times more likely to breastfeed up to six months [OR 4.07; CI 95% (2.36; 7.03); s.s.] compared to mothers aged 25 to 34, who were one and a half times more likely to breastfeed for less than four and up to six months [OR 1,56, CI 95% (0,99; 2,55); s.s. and OR 1,55, CI 95% (1,01; 2,37); s.s.]. In respect to education, mothers with no/lower secondary educational level were five and a half times more likely to breastfeed for less than four months [OR 5,62, CI 95% (3,20; 9,89); s.s.], and four and a half times to only breastfeed for a period of less than six months [OR 4,57, CI 95% (2,55; 7,61); s.s.] compared to women with higher educational attainment. Mothers who had received secondary education were almost three and a half times more likely to breastfeed for less than four months [OR 3,44, CI 95% (2,22; 5,32)], and slightly more than three times more likely to breastfeed for up to six months [OR 3,11, CI 95% (2,07; 4,66); s.s.] with a high-school degree. Analyzing the effect of maternal age and education on breastfeeding, young mothers aged less than 25 years with a lower educational level had more than a six-fold likelihood to breastfeed for less than six months [OR 6,32 (2,64;15,17); s.s.] as to older women with at least secondary education. For young women of less than 25 years of age and a secondary level of education, they were roughly three times more likely to breastfeed for less than six months [OR 3,18 (1,37;7,35); s.s.] compared to older mothers with high-school level.

Increasing maternal age at birth ( $\geq 25$  y;  $> 35$  y) and lower secondary education resulted in an OR of 2,35 [CI 95% (1,05; 5,25), s.s.) for those mothers and an OR of 2,67 [(1,52; 4,67); s.s.] for women with secondary education to breastfeed for less than six months compared to high educational levels respectively.

The social determinant one-parent family is a statistically significant influencing factor for a shortened breastfeeding period of four months with an OR of 3,91 [CI 95% (2,16; 7,07); s.s.] and an OR of 2,64 [CI 95% (1,12; 6,22); s.s.] for breastfeeding less than six months compared to cohabiting and/or married women. Male infants had an 1,75 times elevated chance to be breastfed for less than four months [CI 95% (1,20; 2,55); s.s.] and were 1,5 times more likely to be breastfed

for less than six months [OR 1,49 (1,05; 2,12); s.s.] than girls. Regarding social networks, women who did not dispose over a functioning social support were three times more likely to stop breastfeeding their infants prior to six months [OR 2,98 (1,23; 7,23); s.s.], but data for four months were statistically not significant. Regarding a negative or no opinion of the partner towards breastfeeding, the odds for a shorter breastfeeding period than four months was 5,69 [CI 95% (2,75; 11,77); s.s.], and for breastfeeding less than six months 3,76 [CI 95% (1,83; 7,75); s.s.] than if partners shared a positive attitude on breastfeeding.

This study is thoroughly described and highly intelligible. Regarding its conduct, the description of the infant population is well defined, but through convenience sampling and the inclusion criterion of sufficient command of German language a selection bias was introduced. The predefined confounders intention to breast-feed, maternal smoking, parity, mode of delivery, early infant-to-breast contact, early pacifier use and supplementary feeding were taken into account, as well as ten out of 16 social determinants.

This study was a doctoral thesis funded by the Bundesinstitut für Risikobewertung/Nationale Stillkommission (Federal Institute of Risk Assessment/National Commission on Breastfeeding). The study quality was rated as 'acceptable'.

### **Germany: Study Descriptions of Interventional Study Design**

#### *Libuda et al., 2014*

The study from Libuda et al. (2014) was nested in the polyunsaturated fatty acid nutrition study (PINGU) study, an intervention study designed as a randomized-controlled trial to evaluate the supplementation of long-chain polyunsaturated fatty acids LC-PUFA, mainly docosahexaenoic acid (DHA) during pregnancy on child health. The major objective of the study from Libuda et al. (2014) was to conduct a survey research using data from the PINGU study in order to investigate the prevalence and the demographic determinants of breastfeeding initiation and continuation of exclusive breastfeeding until the age of four months.

1,804 mothers with children between five to 36 months of age divided into infant age groups 5–12, 13–24 and 25–36 months for equal distribution and mothers with internet access were eligible for the study participation. Out of these, 1,013 mothers and their infants participated, and the final sample of 985 mothers with

children between five and 36 months of age entered data analysis. According to information derived from the study protocol, preterm infants had been excluded. Participants were recruited by convenience sampling. Recruitment data were collected through an access panel operated by Kantar Health GmbH, Munich, Germany. There was a special focus on women with low SES. Eligible mothers received three reminders. All mothers with children between five and 36 months of age were selected for an online survey on their and their children's dietary behavior. The study period lasted from 2010–2013, and data were collected through an online survey. The primary outcome of the study was breastfeeding, which was assessed through WHO indicators for early breastfeeding initiation followed by exclusive breastfeeding for at least the first four months (only breast milk without other liquids, including water or solids).

Data were weighed according to residence of federal state (Bundesland), mother's age at the time of the survey, maternal level of school education, maternal level of professional education, household income, number of persons in the household, and community size. In order to avoid younger children's overrepresentation and to enable analyses of potential time trends, an equal distribution of children's age strata (i.e., 5–12, 13–24 and 25–36 months) was conducted. Data were then processed through multifactorial analyses of potential determinants of breastfeeding in logistic model 1, and model 2 that included community size, but did not contain data from all participants due to lack of information. The following social determinants were relevant for analysis: maternal age, SES, and geographical location. 48% of mothers from age group Q1 (18-29 years) breastfed exclusively for four months, as to 59% in Q2 (30-32 years), followed by the highest in Q3 (33-36 years) with 63%, and again 59% in Q4 (37-50 years).

SES was measured as social class divided into low, medium and high with its index composed of maternal school education, maternal level of professional education, and household income. Approximately one third of all women with a low social class breastfed exclusively for four months, compared to the double amount, two thirds of the highest social class. High social class was also highly protective for the initiation of breastfeeding as opposed to low social class with an OR of 0.372 [CI 95% (0.244–0.569)], as well as for exclusive breastfeeding for

four months with an OR of 0.272 [CI 95% (0.191–0.387)]. Comparing high and middle social classes, higher social class remained protective with an OR of 0.704 [CI 95% (0.510–0.970)]. For model 1, data from all participants were analyzed. Analysis from model 2 including community size rendered almost the same results for initiation and exclusiveness of breastfeeding in mothers from a low versus high social class, but for middle social class they were statistically not significant. Taking into account all variables in a multifactorial analysis, only community size (small vs. large) and maternal social status predicted exclusive breastfeeding significantly. Regarding geographical location, mothers from North versus South Germany were almost 1.5 times more likely not to start breastfeeding compared to those from the North [OR 1.418; CI 95% (1.007–1.997)]. In contrast, residence in East Germany was beneficial for the initiation of breastfeeding [OR 0.563, CI 95% (0.348–0.909)] compared with their counterparts from the West. Values were alike in model 2, but proved statistically non-significant for North versus South Germany.

As for the reporting of the study, it is thoroughly described and highly intelligible. Regarding its conduct, the population was not well described and the study protocol had to be checked for gestational age of infants. The focus on women with a low social class as well as the exclusion criteria for women without an access to internet introduced a selection bias, and the fact that data were recalled after 5 months most likely led to a recall bias. Parity was taken into account as a predefined confounder, and for social determinants SES and geographical location. Thus five predefined and 13 social determinants were omitted as confounders during analysis.

The study was funded with the help of the German Federal Ministry of Education and Research. The University of Dortmund contributed with statistical expertise, and the online survey was organized by Kantar Health GmbH. There was no declaration of conflict of interest. The study quality was rated as 'high'.

## **Germany: Study Descriptions of a Secondary Data Analysis**

Pflüger, M. et al., 2010

This secondary data analysis investigated whether WHO recommendations for breastfeeding were followed in infants with an increased risk for type 1 Diabetes (T1D) and was conducted with data from the BABYDIET Study.

The BABYDIET study was an intervention study researching whether delayed exposure to gluten has an impact on developing T1D in infants with a first degree relative having a T1D condition. Study participants were infants representative of the German Caucasian population at high risk of T1D. Of 169 newborn fulfilling eligibility criteria, 150 (i.e., 88.8%) were recruited, among which 75 had a mother and 75 had a father/sibling with T1D. Infants were randomized to a group either exposed to gluten at six or 12 months. All families received the WHO recommendations on breastfeeding, but no further feeding recommendations aside from the introduction of gluten at 6 or 12 months, respectively. Breastfeeding was assessed through whether a mother had breastfed at all (yes or no), and for how long infants were fully breastfed (measured in weeks), whereby definition followed WHO standard (infant received breast milk with or without supplementation with water or water-based drinks, vitamins, and medicines, but without formula or other milk or solids) and any breastfeeding obtained through daily food records. Additional data for the current analysis were obtained either from the child's pediatric records as date of birth, length centile, gestational age, mode of delivery, Apgar-score or from birth and 3-month questionnaires investigating parental T1D status, mother's age at delivery, maternal smoking during pregnancy, and diet during pregnancy. Data from 144 infants entered analysis, which was conducted using a Chi-Square test to assess differences in adherence to WHO breastfeeding recommendations, followed by applying an event analysis. Breastfeeding was the primary outcome.

The multivariate analysis conducted by multiple regression revealed that the relationship between maternal age at birth and age of infant when complementary food was introduced was of interest. Young mothers aged 20-29 years introduced solid food at the infants' average age of 4.2 months ( $p$ -value  $< 0.0001$ ), followed by mothers aged between 29.1 - 31 years at an average of 5.8 months, and age

group 32.1 to 35 years as well as older women between 35.1–42 years at an average of 6.0 months. Statistically significant factors determining breastfeeding were young mothers and smoking during pregnancy.

The intelligibility of the publication was partly limited because the BABYDIET study and actual secondary data analysis was not always very well distinguished, and English sometimes difficult to understand. As for the conduct, the population was not well described regarding gestational age at birth and had to be cross-checked with the BABYDIET study protocol. A selection bias was introduced since only German Caucasian infants participated, whereby authors did not further define the term and were most likely referring to ethnic German children. An information bias was most likely reduced since information was obtained through daily food records over a minimum period of six months. From the predefined confounders, maternal smoking had been taken into account, and for social determinants only maternal age.

The study was funded by the Deutsche Forschungsgemeinschaft (German Research Association) and the Stiftung “Das Zuckerkranken Kind” (Foundation for children with diabetes). The study quality was ranked as ‘low’.

### **Germany: Study Description of a Qualitative Study Design**

#### Wehrstedt, C., 2014

This Master Thesis elaborated in English language was an observational study employing a qualitative research design and explored women’s rationale for breastfeeding beyond infancy in the study area of Bavaria, Germany. A purposive sampling strategy was applied to increase the likelihood of involving key individuals. Recruitment took place through the online forum [www.stillen-und-tragen.de/forum/](http://www.stillen-und-tragen.de/forum/) and a non-governmental organization advocating for breastfeeding, the LaLecheLeague Germany. Sample size was case-oriented in order to assure that the limited amount of data increased effectiveness of analysis, and the first eight subjects willing to participate were selected. Inclusion criteria were to be a Bavarian mother having breastfed her child for longer than 1 year. Exclusion criteria were mothers who were trained health professionals and were experienced in breastfeeding consultation, as well as mothers that had been cared for by the researcher, a trained midwife. Data were collected by audio-recorded, one-

to-one interviews conducted in German employing an interview guide with open and probing questions. Grand tour questions covered subtopics of the research question, and mini tour questions were asking for details. Interviews were conducted in German and took place at private homes of participants lasting approximately 42 to 72 minutes. Results were then translated into English. The type of analysis applied was inductive thematic analysis and Realist Synthesis.

Eight mothers and one additionally for the pretest participated in the study. Regarding their socio-demographic characteristics, women's age ranged from 29-37 years, and half of them had lower educational levels, the other half held a high school degree. They spent 0–25 hours per week on employment, had 1–6 children, and area of residence was the rural area as well as the capital of Bavaria, Munich. All participants were married and cohabiting with their husbands. Approximately one third had delivered their infants through Cesarean Section. Breast-feeding was the primary outcome.

Mothers had breastfed their infants for 18–33 months. The two social determinants social networks and culture were researched. Referring to the first one, mothers reported that breastfeeding after birth was highly valued from the social environment, but turned into the opposite when their child grew older. The husband's attitude and his practical support were regarded as indispensable for successful breastfeeding. Regarding the culture of the environment, breastfeeding was considered a normative value, but socially accepted only for a maximum duration of one year.

This study was highly intelligible and very well described. Regarding the conduct, the infant population was not defined in regards to gestational age. Selection bias was reduced by including the first eight candidates. An information bias was introduced through the fact that the researcher is a reproductive health professional, and through translating results from German to English, esp.in the view of cultural nuances. Infant age at point of interview was not reported implying a recall bias. Possible other social determinants were neither researched nor discussed. The study was conducted as a Master Thesis at the Glasgow Caledonian University and further information regarding funding was not disclosed. The study was rated as 'acceptable'.

### **United Kingdom: Study Descriptions for Quantitative Research Designs**

Bishop et al., 2008

In their study, Bishop et al. (2008) applied a cross-sectional research design and sought to examine which external factors impact on the mother's decision regarding the infant feeding method. The area where recruitment took place belonged to the top five most deprived regions according to the Index of Multiple Deprivation (Northern Ireland Statistics). A purposive sampling strategy was employed by contacting managers from mother-and toddler groups in West Belfast. They informed their members about the study, and eight groups consented to participate. The managers distributed information on the study and the respective consent forms. A pilot study was conducted with 22 women randomly selected from the sample followed by 170 questionnaires distributed in the eight groups. Finally, 120 mothers with infants aged under five months actually participated, whereby no information was provided on their gestational age at birth. The total response rate was 70.5%, and no information was available on non-respondents. Authors did not reveal how they conducted the data analysis. The primary outcome was breastfeeding, defined as infant ever being put to breast, whereas never breastfed was defined as bottle feeding.

In total, three quarters of all study participants had attended ANC. Among breastfeeding mothers, three quarters had attended ANC services, while this was the case for 73.1% of bottle feeding mothers. As for obstetrics, 33.8% of mothers that were breastfeeding rated the information they had received from the maternity ward nurse as excellent, 27.9% as very good and 30.9% as good, while 9.6% of bottle feeding mothers rated the information as poor, and 9.6% as merely satisfactory. About 30% of bottle feeding mothers had rated the information as good, approximately 17% as very good and about 2% as excellent. As for the information received from the community midwife, around half of breastfeeding mothers appraised it as good, and 44.1% as very good compared to only 15.4% of bottle feeding mothers, among whom 7.7% assessed it as poor. Regarding the actual breastfeeding behavior, 57% of the study participants had started to breastfeed, out of which 29% did so exclusively, and 71% practiced a mixed feeding. For the maximum duration of one week the share of 14.7% of mothers were

breastfeeding, 19% between one and two weeks, 14.7% three to four weeks, 23.5% one to two months, and 14.6% up to six months.

The social determinants maternal age, SES, one-parent family, social networks, culture and parental leave were subject to analysis. Mothers were divided into four age groups with different breastfeeding rates. Among mothers aged 20–24 years, 16.6% breastfed and 83.3% bottle fed; among those aged 25–29 years, 64% were breastfeeding and 35.8% were not; for the maternal age group 30–39 years, 58.3% of infants were fed on breast milk, compared to 41.6% who received formula, and finally among women aged 40–50 years, around 57.1% were breastfeeding, and 42.8% were not. The social determinant SES was measured as occupational class, defined as I professional, II managerial and technical, III skilled non-manual, III skilled manual, IV partly skilled, and VI unskilled. Around 40% of the study participants belonged to class IV and VI. As for mothers belonging to class I (1.7%) represented by two mothers, both were breastfeeding and none was bottle feeding, whereas in class II (3%), no mother was breastfeeding, and all were feeding formula to their infants. In class III (skilled non-manual, 15.8%), 68.4% were breastfeeding compared to 31.6% who did not. In class III skilled manual (29.2%), 62.8% were breastfeeding opposed to 37.1% bottle feeders. For class IV (21.7%), 69.2% of women breastfed and 30.7% did not, and in class VI unskilled (18.3%) 36.3% were breastfeeding compared to 63.6% bottle feeding mothers. Regarding students (1.7%), one mother was breastfeeding, and one not, and finally among unemployed mothers (9.2%), 53.6% were breastfeeding, compared to 46.4% who did not.

Approximately 15% of participating mothers were living as one-parent families, and 22.2% were breastfeeding, compared to 77.8% women bottle feeding their offspring, whereas 62.7% of married/cohabiting mothers were breastfeeding, and 37.7% bottle feeding.

The social determinant, 'social networks', was operationalized as the influence of the personal environment on the infant feeding method. From the sample, 81.2% of respondents who named their mothers as an influencing factor on their infant feeding choice were breastfeeding, and 18.7% who did not, compared to the group that named their partner as most influential, where 58.3% were breastfeed-

ing and 41.6% bottle feeding. Those that mentioned other relatives like a sister or other siblings, 18.2% were breastfeeding and 81.8% were not. For those citing their friends as well as mothers who did not know who influenced their decision, none was breastfeeding, but all bottle feeding.

Culture was translated into questions about whether the perception of “the norm” and/or the tradition had influenced the breastfeeding outcome. Out of those mothers indicating that the norms for breastfeeding had influenced their decision, none was breastfeeding and all were bottle feeding, and of those that named tradition, 71.4% were breastfeeding and 28.6% bottle feeding. It has to be noted here that multiple answers were possible.

In regard to the reporting style, the study suffers from some shortcomings, but in general it is intelligible. The main study limitation is that the data collection period and the data analysis method were not mentioned. As for the conduct, gestational age at birth was not defined for the infant population, and due to the purposive sampling method in highly deprived areas, a selection bias might have been introduced. Though the study employed a retrospective assessment, a recall bias was reduced since the recall period was limited to five months. From the pre-established determinants, intention to breastfeed, and of the social determinants six out of 16 were taken into consideration. No information on study funding, nor a declaration regarding a potential conflict of interests of the authors was provided. The study quality was appraised as ‘low’.

#### *Brown et al., 2010*

Aim of the cross-sectional study was to research the relationship between level of deprivation and breastfeeding outcome in English and Welsh women. In total, 216 mothers with infants aged six to 24 months and a mean age at the point of data collection of ten to 12 months participated, with 144 English and 74 Welsh mothers, and 8.5% of the English as well as 9.5% of the Welsh samples living in the most deprived 10% of the areas of the respective countries. Study participants had been recruited in day care centers, postnatal groups, Mother and Baby groups and Community Centers in Swansea and the surrounding area, as well as from online parenting forums based in the United Kingdom. No significant differences were observed regarding age, educational level and breastfeeding dura-

tion between mothers recruited from groups versus online. Respective deprivation level was determined through home postal code, and data were collected retrospectively with the aid of a questionnaire. However, due to the fact that deprivation scales were not comparable, the samples from England and Wales had to be analyzed separately. The data analysis was conducted by estimating the correlation between SES and the corresponding Indices of Deprivation, as well as with breastfeeding duration. A multivariate linear regression was carried out subsequently to establish socio-economic factors that independently predicted breastfeeding duration. Breastfeeding was assessed as initiation and duration of breastfeeding measured in days/weeks and was the primary outcome. A share of 82.4% of mothers from both samples had started to breastfeed, and almost one third continued for one week, another third pursued breastfeeding for a period of six weeks, and about 28% for 26 weeks.

Although no specific information was provided in respect to maternal age and years of education, authors stated that mothers who breastfed for a longer time were significantly more likely to be older and more educated. Regarding SES, mothers with a higher income, who owned their own house and had a partner with a managerial or professional employment displayed a significantly longer breastfeeding period. As a consequence, a low SES was inversely associated with breastfeeding duration. The Index of Multiple Deprivation - measured as income deprivation, employment deprivation, health deprivation and disability, education, skills and training deprivation, barriers to housing and services, living environment deprivation and crime- was a statistically significant predictor of breastfeeding duration in both samples. An increased level of deprivation was associated with a shorter breastfeeding period. Authors state that the Index of Multiple Deprivation was a useful tool to predict breastfeeding duration. In conclusion, there were no substantial differences between initiation and duration of breastfeeding in English and Welsh mothers, and in both areas older women with a higher educational level living in their own homes and being married were less likely to live in a deprived neighborhood and more likely to breastfeed for a longer time.

The study was thoroughly described and highly intelligible. However, the infant population was not defined in relation to gestational age at birth, nor was the time of data collection reported. The convenience sampling strategy might have incurred a selection bias, and the nature of the cross-sectional design a recall bias. Of the pre-established confounders, intention to breastfeed and parity were taken into account, and from the social determinants twelve out of 16 social determinants were neglected. As for funding, A. Brown had received an Economic and Social Research Council Doctoral Fellowship, and authors declared no conflict of interests. The study quality was ranked as 'low'.

*Brown and Lee, 2011*

The study from Brown and Lee set out to investigate the attitudes as well as experiences of mothers that breastfed their infants exclusively for six months following WHO recommendations by applying a qualitative research design.

Study area was the City and County of Swansea, Wales. A purposive sampling technique was employed by snowball sampling via participants who had consented to take part in the study. Recruitment took place through advertisement in organizations like breastfeeding support groups in day care centers, postnatal groups, and Mother and Baby groups, as well as online through internet-based parenting forums that support a delayed introduction of complementary food. Finally, community groups were identified and contacted in areas that differed in their levels of social deprivation. Women who contacted the researchers were then screened for eligibility, with the single selection criterion being exclusive breastfeeding for six months according to WHO definition (no liquid aside breast milk, no complementary food, only vitamin drops and medications). One third of mothers with children between six and 12 months were finally recruited and took part in the study. Semi-structured interviews were carried out face-to-face or over the phone after having sought consent, and were audio-recorded and subsequently transcribed. Data were analyzed with content analysis by identifying categories that were then grouped into key themes and subthemes, which was practiced until saturation was reached. Aside from the researcher, two reviewers examined the transcripts independently, and in more than 90% of cases discrepancies on coding were resolved. Breastfeeding was the primary outcome.

The mean age of mothers who participated in the study was 27.63 years, with several younger mothers having a lower level of education. From the results authors gained the impression that other than demographic characteristics it is the attitudes and beliefs that exercise a stronger influence on breastfeeding behavior. Regarding social networks, every mother knew at least one person in her near social environment who had breastfed for a longer time than usual, mostly the child's maternal or paternal grandmother. This knowledge was like an ascertainment for the participant to be behaving in a "normal way" if she was breastfeeding for an extended period of time. At the same time, mothers who breastfed exclusively until six months were confronted with a variety of negative comments and even rejection of their behavior from their social environment like other family members or peers/friends. The content of quotes cited along with participants' age support the authors' conclusion that self-determination is the main influencing factor for deciding on exclusive breastfeeding. However, the sample of women was small with a high share of skilled mothers, who are known to practice prolonged breastfeeding more frequently.

The study was well described and intelligible, however it sometimes lacked a more elaborated explanation of the qualitative findings. Information on gestational age and weight at birth from the mothers was available. The purposive snowball sampling technique most likely introduced a selection bias enhanced by the recruitment through internet, which targets older, more educated, middle-class mothers. Infant age up to twelve months might have led to a recall bias. No information was provided on the period of data collection. None of the pre-established determinants had been addressed, and for the social determinants four out of 16 were taken into consideration. Authors declared to have not received any funding support, and that there were no competing financial interests. The study quality was rated as 'acceptable'.

Cooper et al., 1993

In this cohort study, Cooper et al. (1993) investigated the association between psychiatric as well as social factors and the early suspension of breastfeeding. Study participants were recruited from two sites during ANC. For information on the sampling procedure, the authors referred to another publication. At recruitment site no. 1, John Radcliffe Hospital/Oxford, a representative sample of 483 women were examined antenatally and were followed up for twelve months. Three months after delivery mothers were interviewed for their breastfeeding behavior. At the second site, Rosie Maternity Hospital in Cambridge, eligibility criteria were on the mother's side to be primiparous, between 20–40 years old, living in a partnership (married/cohabiting), and on the infant's side gestational age at birth 37–42 weeks, birth weight of at least 2,500g, and having no major congenital malformations. 702 women and their infants met the inclusion criteria, and 695 agreed to participate in the study. Six weeks after birth they were screened for depression with the aid of the Edinburgh Postnatal Depression Scale, and 674 women returned their questionnaires. All mothers who had scored high, 78% of those who had an intermediate score and some randomly selected women with low scores were medically examined for depression. Out of this sample, a final sample was selected consisting of 58 mothers who had a minor or major depression, and 55 who had not. Interviews on their breastfeeding behavior were conducted two to three months postpartum at either recruitment site. Additionally, data on demographic characteristics and social support were collected. Breastfeeding was operationalized as a dichotomous variable, in breastfeeding initiation and stop prior to eight weeks and no breastfeeding initiation.

Data analysis was conducted for both samples individually. Univariate analysis (Chi Square tests) was carried out to assess factors that were associated with disruption of breastfeeding. A logistical regression was then run to find out the relationship between predictive factors. An additional analysis with a randomly selected sample was run for the Oxford group to make sure that the sampling strategy did not incur biased results. Breastfeeding was the primary outcome.

Out of the 243 mothers from the John Radcliffe Hospital/Oxford hospital, 200 initiated breastfeeding and 54 had stopped before eight weeks. Of the Rosie Ma-

ternity Hospital/Cambridge, 102 out of 113 women started breastfeeding and 40 mothers did not continue until eight weeks after delivery. Maternal age was divided into two groups, aged below or above 25 years. Younger women who were middle class and of the Oxford sample were more likely to stop breastfeeding prior to eight weeks compared to women older than 25. Results from the Cambridge sample revealed that a lower educational level was significantly associated with a breastfeeding period of less than eight weeks. Educational level was measured as A-level (German Abitur) or below, and in the Cambridge sample women who had achieved less than an A-level were significantly more likely to breastfeed for less than two months. In regard to SES, social classes were calculated without further specification. Working class mothers were significantly more likely to breastfeed less than eight weeks, regardless of their age, while middle class women younger than 25 years were less likely to breastfeed compared to those aged above 25 years. Another factor that had a negative impact on breastfeeding duration was an episode of depression after delivery.

The reporting of the study had some shortcomings in regard to in-depth explanation (e.g. regarding recruitment at the Oxford site, or composition of indicators like social class), but in general it was intelligible. The infant population was well defined. In respect to biases, supposedly a representative sample was recruited, however there were no further details available, but the measure of quality control through randomization implies that selection bias was reduced. As for information bias, it remained unclear by whom and where the interviews were conducted, and a possible recall bias incurred since data on breastfeeding were only collected at one point in time. However, the period of data collection was not disclosed. From pre-established confounders, parity had been taken into account. As for the social determinants, maternal age, maternal educational level and SES were considered. The Oxford study was funded by the Mental Health Foundation and the Oxford Regional Health Authority, the Cambridge study by the Winnicott Trust and the Medical Research Council, and Dr. A. Stein had received a Wellcome Trust lectureship, as well as support for recruitment and statistical analysis from colleagues. The study quality was rated as 'acceptable'.

Lawton et al., 2012

In this cohort study with a quantitative research design, four aims were pursued. First, the predictive utility of an extended two-version Theory of Planned Behavior to predict the intention to breastfeed and actual breastfeeding initiation and maintenance was to be estimated. The second aim was to determine whether differences exist between White British and South Asian mothers in regard to the above mentioned intention, start and sustainment of breastfeeding after six months postpartum. Lastly, the third objective was to assess whether established differences between the two ethnic groups are matched in the differences of the Theory of Planned Behavior variables, and elaborate advice on social cognitions that should be addressed in order to influence intention, start and sustainment of breastfeeding at six months. Study participants were recruited from the BiB 1000 longitudinal study (Born in Bradford). In total, 736 pregnant women were recruited by the care team of ANC services during the last trimester with an anticipated birth date between January and July 2009. The research team differed from the care team. A convenience sampling strategy was employed, and each selected woman was contacted by phone. In case the phone call was not successful, the next woman was approached. The telephone interviews were conducted in Urdu, Mirpuri and English. The research instrument was a standardized script developed in English and translated and transliterated into Urdu and Mirpuri. A sample of 250 women participated in the telephone interview, the sample being representative of the original BiB cohort, including the fact that women from South East Asia, mainly Pakistani, were overrepresented. Six months after birth women were interviewed for their actual breastfeeding behavior either during a clinic visit or at home. Non-responders had a lower intention to breastfeed. Breastfeeding was the primary outcome and was assessed through the dichotomous indicators (yes/no) for start of breastfeeding (yes/no) and breastfeeding at six months.

The data analysis was not further described, but from the results tables it could be concluded that descriptive statistics, correlations and a moderated logistic regression was run to determine associations between predictor variables and start as well as maintenance of breastfeeding.

Maternal educational level was measured as the highest educational qualification represented by an O level/GCSE degree (Fachabitur). Women of a lower educational level had more than a four times higher likelihood not to initiate breastfeeding [OR 4.14, CI 95% (1.53; 11.27); s.s.], but the determinant was not statistically significant in relationship to breastfeeding for six months. In the moderated logistic regression, the OR for low maternal educational level and initiation of breastfeeding was 8.27 [CI 95% (2.20; 31.06); s.s.] and 2.45 in respect to breastfeeding for six months [CI 95% (1.04; 5.75); s.s.]. As for ethnicity, White British mothers were three times more likely not to start breastfeeding [OR 3.02, CI 95% (1.29; 7.05); s.s.], and had an OR of 2.41 [CI 95% (1.08; 5.36); s.s.] in relationship to breastfeeding for six months. Ethnicity was not statistically significant for the calculation of step 2 of the moderated logistic regression. The social determinant culture was operationalized as affective attitudes towards breastfeeding and entered the moderated logistic regression as a predictor variable only for step 2. Mothers with a positive attitude were almost two times more likely to start breastfeeding [OR 1.90; CI 95% (1.05; 3.43); s.s.] and four and a half times more likely to breastfeed for six months [OR 4.54; CI 95% (1.70; 12.10); s.s.].

The study was thoroughly reported, but intelligibility was at times limited by the abundance of data, and the lack of a clear description of how the analysis was conducted. The population was not defined in the publication, but fit the applied selection criteria after verifying the information on the respective website. The convenience sampling strategy might have incurred a selection bias. The interviewers were not further described, and mismatched in ethnicity might have introduced an information bias. Of the pre-established determinants, parity and intention to breastfeed were addressed, as were 13 out of 16 social determinants. Sources of funding were not disclosed and there was no declaration in regard to conflict of interests. The study quality was rated as 'acceptable'.

#### Oakley et al., 2014

The cohort-study conducted by Oakley et al. (2014) aimed to establish which factors are linked to the termination of breastfeeding in the first six weeks. The study area was England. Data for recruitment were derived from a national survey that had been carried out in the study area in 2010 collecting information on

women's encounter with maternity services, their health status and well-being three months after childbirth. 10,000 women aged 16 with their infants born in a specific fortnight in 2009 were randomly selected. They received a questionnaire and information on the study in different languages approximately three months postpartum. A reminder letter and another mail with a questionnaire were sent after two and four weeks respectively. From those contacted, 5,333 women (55.1%) returned a questionnaire that entered the analysis. Infants from multiple births and/or gestational age below 37 weeks were excluded, and finally 4,872 mothers participated in the study. Breastfeeding indicator was breastfeeding initiation in the first days (infant received any breast milk, either exclusively or in combination with formula) practiced either for ten days or six weeks. The two dates were considered as key points in time, because after ten days midwifery care usually ends, and a routine health check for the baby normally takes place after six to eight weeks.

All variables that entered the analysis were self-reported values collected from the survey except for ONS data on the Index of Multiple Deprivation value of participants. Responders to the questionnaire differed from non-responders in their Index of Multiple Deprivation, thus analysis was weighted according to quintile. A three-step logistic regression was conducted. First, unadjusted ORs were calculated for the respective explanatory variable and termination of breastfeeding on day 10 and week 6, then adjustment of the results with variables from the same group, i.e. socio-demographic characteristics, antenatal and postnatal support, and finally adjustment of all variables together. Only variables that proved to be independently associated with breastfeeding termination entered the subsequent step for further analysis. Moreover, population attributable fractions were calculated for variables of breastfeeding support that were independently linked to breastfeeding termination.

From the sample 3,840 mothers (79%) had started breastfeeding, and 13% had stopped at day 10. From the 3,354 women that had continued after day 10 around 17% stopped at week 6, so roughly more than half were still breastfeeding then. Women who had stayed in obstetric care for one to two days were one

and a half times more likely to end breastfeeding at day 10 [OR 1.42, CI 95% (1.08; 1.88); s.s.], compared to those who stayed for three to four days.

Maternal age was measured in six age groups. For young mothers aged 16–19 years adjusted values to stop breastfeeding by day 10 after birth were statistically not significant. Women of age group 20–24 were one and a half times more likely to breastfeed only until day 10 compared to mothers from older age groups [OR 1.51, CI 95% (1.04; 2.19); s.s.], and mothers of age group 35–39 years were twice as likely to breastfeed until day 10 [OR of 0.66, CI 95% (0.48; 0.91); s.s.] and beyond until week 6 [OR of 0.55, CI 95% (0.40; 0.75); s.s.] compared to their younger counterparts. Values for mothers aged 40 and above were statistically not significant.

The social determinant SES was operationalized as Index of Multiple Deprivation and measured from Quintile 1 to Quintile 5, with Quintile 1 the least deprived and reference group, Quintile 5 the most deprived, and no further specification for the other quintiles. Values for mothers from Quintile 2 were statistically not significant. Women from Quintile 3 were about one and a half times more likely to stop breastfeeding at day 10 [OR 1.46, CI 95% (1.07; 2.01), s.s.], as well as between day 10 and week 6 [OR 1.49, 95% CI (1.11; 2.01), s.s.], however, the adjusted OR for cessation at day 10 was statistically not significant. Women from Quintile 4 were one and a half times more likely to stop breastfeeding at day 10 as well as from this point in time until week 6 compared to mothers from the other Quintiles (OR of 1.45 [CI 95% (1.03; 2.03), s.s.]). As for mothers from the most deprived quintile, adjusted OR was 1.84 [CI 95% (1.27; 2.68), s.s.] and for ceasing breastfeeding between day 10 and week 6 was 1.79 [CI 95% (1.25; 2.57), p-value s.s.] opposed to women from the other groups.

The third social determinant subject to research was ethnicity and grouped into white and non-white, with the latter one representing the reference group. White women were three times more likely to stop breastfeeding at day 10 [OR 3.02, CI 95% (1.74; 5.22), s.s.]. As for continuing breastfeeding from day 10 to week six, white mothers were two and a half times more likely to stop in that period [OR 2.49, CI 95% (1.63; 3.80), s.s.].

The study from Oakley et al. (2014) was very well reported and intelligible except for the section about population attributable fractions and the population well defined. A selection bias might have occurred due to the response rate of 55.1% since responders differed from non-responders in their Index of Multiple Deprivation, but this was amended through weighting. Since it is a large study, it has a highly statistical power and can be considered as fairly representative. One out of the pre-determined confounders, mode of delivery, was considered in analysis, as well as three out of 16 social determinants. Authors declared the research to be an independent study sponsored by the Policy Research Program in the Department of Health and that there was no conflict of interests. The study was rated as 'high-quality'.

*Sittlington et al., 2007*

The research conducted by Sittlington et al. (2007) employed a cross-sectional design and intended investigating infant-feeding attitudes of mothers in Northern Ireland and their influence on the actual uptake of breastfeeding. Study participants were recruited through convenience sampling by approaching all women who attended ANC services at the Royal Victoria Hospital in Belfast three days per week from February to May 2003. All but two women that were contacted participated in the study, and a sample of 200 pregnant women filled the questionnaire on Iowa Infant Feeding Attitude Scale and demographic data. In order to relate data to the actual feeding method after birth, data were collected from the Northern Ireland Maternity System in February 2004. Younger mothers were overrepresented in comparison to older mothers. Breastfeeding was the primary outcome, assessed through the indicator feeding outcome at discharge from the Royal Victoria Hospital and measured as artificial versus breastfeeding.

Analyses were performed as follows: one-way analysis of variance (ANOVA) in order to find out how scores from the Iowa Infant Feeding Attitude Scale are linked to sociodemographic variables, and a post-hoc analysis subsequently to explain the main effects accompanied by independent sample t-tests to determine the differences in the infant-feeding attitudes of mothers in comparison to the actual feeding behavior.

Of the 200 mothers who participated in the study, 42.7% of women intended to breastfeed, one third (32.3%) planned to feed their infants on formula, and 25% were undecided.

Half of all women had started breastfeeding in the hospital and among them 40.1% were exclusively breastfeeding and 59.9% of the women were feeding their infants formula. The social determinant subject to analysis was culture, measured as attitude towards breastfeeding. Of the mothers who had favored breastfeeding during pregnancy, 91.5% had started breastfeeding after childbirth, and 78% were still breastfeeding at hospital discharge, whereby 22% had changed their mind and fed formula. Among women who had planned to feed their infant on formula, 95.2% did so, but 8.1% started breastfeeding postpartum, and 4.8% were still breastfeeding when they left the hospital. Among undecided mothers, 37.5% had started breastfeeding, and 79.2% were formula feeding. In general, an attitude that is favorable to breastfeeding had a positive impact on the actual behavior and could be predicted by the Iowa Infant Feeding Attitude Scale.

The study was well reported, but intelligibility was impaired by an abundance of text information in combination with numbers. The infant population was not defined, and a selection bias might have been introduced by the convenience sampling method. Additionally, the study sample was relatively small and had a reduced statistical power. From the predefined determinants, intention to breastfeed was taken into account, as well as 15 out of 16 social determinants. The study was funded by the Department of Education and Learning, Northern Ireland, and supported by Medela AG (Baar, Switzerland). Authors declared not to have any conflict of interests. The study quality had been rated as 'acceptable'.

### **United Kingdom: Study Descriptions for Qualitative Research Design**

#### *Dykes et al., 2003*

The research from Dykes et al. (2003) aimed at finding out what adolescent breastfeeding mothers experienced and what kind of support they needed to establish a successful breastfeeding situation by employing a multi-method qualitative research design. The study area was North-West of England and data was collected from 09/2001 to 10/2002. The research was conducted in three stages:

first focus group discussions were conducted with adolescent mothers in order to collect information on experiences with breastfeeding. Second, four vignettes were developed out of the results and presented to midwives as well as members of the Breastfeeding Network. Information from both research steps were then elaborated for the semi-structured interviews held with adolescent mothers. Study participants for research phase 3 were recruited through convenience sampling by the hospital staff. Inclusion criteria were that mothers had to be aged 13 to 19 years, be able to communicate in English, and had delivered a healthy term baby. Mothers with known learning difficulties, mental health problems, a sick neonate and/or one who was admitted to neonatal care were omitted from the study. In total 26 women were approached, and 24 consented to participate. Finally, 13 mothers were interviewed in their homes by two researchers. They were all aged between 14–19 years, of white ethnicity, twelve women primiparae, and one having delivered her second child with infants aged between six to 10 weeks at the time when the study was conducted. The semi-structured interviews were audio-recorded and transcribed verbatim. The breastfeeding indicator was the primary outcome, despite not being further specified.

The interview transcripts were analyzed line by line. They were then subject to thematic network analysis through identifying basic themes that were grouped according to themes in two stages. Field notes, memos and reflections were additionally used to further the analysis. Two researchers performed the analysis independently, and for each phase of theme identification consensus was reached.

The social determinant under investigation was maternal age, which was reflected in the assembly of the study sample. Eight of the study participants had been breastfeeding for up to two weeks, one mother up to three weeks, and four mothers up to six weeks. Results revealed five types of support: emotional, esteem, instrumental, informational and network support. Neither type of support could be accepted unless esteem support was rendered at first.

The study was thoroughly described and highly intelligible. The population was well defined. The purposive sampling method introduced a selection bias, enhanced by the fact that all study participants had started breastfeeding. An infor-

mation bias might have been introduced through the interviewers, whose characteristics were not further specified. However, the development of the interview guide by means of participatory research reduced the information bias. From the pre-established determinants, parity and supplementary feeding were addressed, as was one out of 16 social determinants, i.e. maternal age.

Funding for the study was not disclosed, nor was a declaration on conflict of interests issued. The study quality was rated as 'acceptable'.

### Earle, 2002

The qualitative study of Earle (2002) applied a prospective research design and aimed at investigating aspects that impacted on starting to breastfeed in 19 women. For this purpose, 21 women were recruited during their first pregnancy during ANC in twelve clinics located in the West Midlands. A total of 19 women aged 16–30 years were of a white ethnicity except one who categorized herself as Asian, with a broad range of occupations participated in the study. In-depth, unstructured interviews were conducted three times at participants' homes, at two occasions during pregnancy, and one six to 14 weeks postpartum. They were all audiotaped and transcribed verbatim. Breastfeeding was the primary outcome and was assessed as breastfeeding initiation. All interviews were conducted by one researcher, who also performed the analysis.

A grounded-theory approach was applied to analyze the transcripts using a system of open coding. Categories were developed accordingly, and from those themes were generated. Though participants had been offered to read the final manuscript, there was no request issued in this respect.

Out of the 19 women, twelve were formula feeding, and seven had started to breastfeed, out of which one stopped after day 3 postpartum. Although women reported to have received advice on breastfeeding in health services, the majority of them had already taken the decision before conception or in the early period of pregnancy. Data analysis revealed that the decision on either way of infant feeding was taken at an early stage and irrespective of the social class of participants. Historically, breastfeeding had been experienced as a common and everyday behavior, which was then subject to change and is viewed in a very different way in contemporary society. Women emphasized that it was not breastfeeding per se

which was seen as a problem, but the performance in front of others and in public since breasts are not perceived as an element of nurturing an infant anymore, but as a sexual symbol. Thus the social determinant culture has gained a substantial importance in impacting on breastfeeding behavior.

This study was very well described and highly intelligible. However, the infant population was not defined, and no information provided on how the research instrument was developed. Regarding biases, the purposive sampling method introduced a selection bias, and the fact that all interviews had been conducted by the same researcher possibly led to an information bias. The likeliness of a recall bias was substantially reduced due to the fact that women were interviewed three times. No other pre-established determinants except for intention to breast-feed were addressed, and out of the 16 social determinants one, culture, was considered. The study was rated as 'acceptable'.

#### Gatrell, 2007

In her qualitative research published in 2007, Gatrell aimed at understanding the experience of women who combine work and breastfeeding. Data were collected from 1999 to 2002 through a snowball sampling technique in London, Merseyside, Greater Manchester, Durham, Essex and Cheshire in order to protect study participants from being identified by employers and other professional agencies. The author considered this as a very important measure since the disclosure of the maternal status could impede women's success for their careers.

Participants were selected to resemble members of contemporary society in the United Kingdom who are breastfeeding. Finally, 20 qualified mothers holding at least one educational degree, employed and living in a partnership (either married or cohabiting) with infants below age 5 years and 18 fathers were recruited. Results from the analysis of data obtained from fathers were not presented. Semi-structured, in-depth interviews of mothers and fathers were conducted separately. Breastfeeding was assessed as breastfeeding initiation and duration, and was the primary outcome. 19 mothers had initiated breastfeeding, of whom 16 continued for less than four weeks, and one had breastfed exclusively for five months.

Themes from each interview were identified and subsequently compared with corresponding literature on breastfeeding, motherhood and work. As for the social determinant culture, one employed woman reported being dismissed while breastfeeding her child in a café she had supported previously as part of her job. In respect to workplace regulation, mothers stopped breastfeeding at work because they were afraid that their physical appearance could be “impaired” due to breast milk leakage, and felt the pressure to “fit in”, which prevented them from expressing and storing milk. One major challenge mentioned was no provision of appropriate places to breastfeed or express milk. A woman reported that she sometimes even had to use the lavatory. As for parental leave, women reported that they enjoyed longer periods off work than usual, but none had the opportunity to stay at home and breastfeed exclusively for six months. One woman who had just started a new job returned to work after only three weeks postpartum in order to secure her employment.

The study was well reported, but sometimes limited in its intelligibility since results and their interpretation were presented together. The infant population was not well defined, and no information was provided on the development of the research instrument. In respect to the data analysis, information was limited. Due to the snowball/purposive sampling procedure, a selection bias was introduced. With regard to an information bias, information on the interviewer and the interview location is missing. None of the pre-established determinants was addressed, and out 16 of the social determinants, three were addressed. Funding sources or declaration of competing interests was not disclosed. The study quality was rated as ‘low’.

Williamson & Sacranie, 2012

Williamson and Sacranie (2012) strived to gain insight on British Muslim mothers' concepts about and experiences with breastfeeding after having received specific information both through the biomedical system and the Islamic religion. In order to explore this matter, a qualitative phenomenological research methodology was applied. No information was provided about the point in time when the data collection took place. Study participants were recruited through snowballing from Islamic communities residing in the Midlands in a culturally diversified city. A purposive sampling strategy was applied to identify women who met the inclusion criteria for this research, namely having British nationality; breastfeeding, regardless of parity; and considering themselves to be active Muslims, especially practicing the usual five prayers per day.

Six women participated in the study with ages from 32 to 42. All of them were married, had a further or higher educational level, that was not specified, were fluent in English, and originated from India, Malawi, Kenya and South Africa, with two of the women being first generation immigrants, and four second generation immigrants. Two interviews were conducted with each of the 6 participants in their homes. At the time of the first interview, three mothers had one child, and every other mother had 3, 5, and 6 children respectively. Data were collected through semi-structured interviews with open, non-leading questions. All interviews were conducted by one researcher, who was native to the community under research and knowledgeable in the languages in which the interviews were conducted. At the time of the first interview, women were breastfeeding their infants aged between three and twelve months, and the second interview was scheduled for a point in time when the infant was not breastfed anymore. All interviews were audio-recorded and transcribed completely. Study participants received a copy thereof shortly after the interview had been conducted with the possibility to add information, if necessary. Breastfeeding was the primary outcome of the study.

In regard to the analysis, an interpretative phenomenological method was applied. For the analysis, researchers aimed at creating a meaning through the information the women disclosed about their breastfeeding experiences. Each in-

interview was considered as a case study, and after having coded them individually, transcripts were analyzed together. Double hermeneutic coding was developed, based on themes that were then transformed into master themes accordingly. Regarding the researchers, one identified as an insider of the target population being a Muslim woman who had breastfed her daughter, and the other one was a non-Muslim, childless man.

Study participants had breastfed their children between 3.5 months and 24 months, with the majority of them over a year. Religion was the social determinant of interest and was operationalized as Muslim faith. Study participants reported that breastfeeding is the norm in Islam. Breastfeeding signifies 'spiritual nourishment' of the child and that it has a nutritious, as well as moral value. The breastfeeding mother gets accredited for breastfeeding. Regarding the period recommended for breastfeeding, both the WHO and Muslim religion advocate for two years. No information was provided about the other two indicators, onset and period of exclusive breastfeeding.

The study was very well described and highly intelligible. However, gestational age at childbirth and the period of data collection were not well defined. The purposive sampling strategy introduced a selection bias. None of the pre-established determinants were addressed, and only one out of 16 social determinants, was considered. Authors did not disclose funding resources, but declared that there was no conflict of interests. The study was rated as 'acceptable'.

## **Ghana: Study Description for a Quantitative Research Design**

### *Aidam et al., 2005*

The observational, cross-sectional study of Aidam et al. (2005) was conducted from May to August 2000 with the aim to investigate which determinants influence exclusive breastfeeding behavior in mothers and their infants attending welfare clinics in Ablekuma, Greater Accra. Recruitment was conducted by convenience sampling, and took place at 13 Mother-Child-Health clinics. Selection criteria for study participants were biological mother of an infant aged up to six months, having no medical conditions that might impair breastfeeding (e.g. HIV/AIDS). After seeking consent, 376 mothers took part in the study, and none of them reported any medical problem. The outcome measure of interest was the infants' age at the time when complementary food was introduced, such as mushy or solid foods (e.g. plain water, sugar solution, juices, herbal teas, other teas, baby formula, other liquids, solid/marshy foods). The assessment was conducted in two ways, retrospectively for the entire breastfeeding period and by 24-hour recall. The research instrument was a questionnaire adapted from the LINKAGES project (Academy for Educational Development) and filled out with the support of an interviewer fluent in the main languages spoken in Ghana, i.e. English, Ga, Twi and Ewe. The data were analyzed through univariate and multivariate regression applied in two models. Breastfeeding was the primary outcome. All but three mothers had attended antenatal care and received advice on breastfeeding, and almost all had heard about exclusive breastfeeding with 80% of women being aware of at least three out of six breastfeeding recommendations. Women stated that in general breastfeeding support at the maternity ward was stronger than during pre- and postnatal care. Results from the multivariate analysis demonstrated that women who had delivered at a hospital/polyclinic were almost twice as likely to practice exclusive breastfeeding from birth [OR 1.96, CI 95% (1.08; 3.54), p-value < 0.05 s.s.] as well as in the last 24 hours [OR 2.11, CI 95% (1.10; 4.05), p-value < 0.05 s.s.] compared to those having delivered at a maternity/private clinic or at a TBA's home. Approximately half of the mothers from the study sample had exclusively breastfed from birth, 70.2% in the previous 24 hours, and, comparing both indicators, a total of 51.3% were exclusively breast-

feeding. The social determinants maternal educational level, wealth index and social networks were significantly associated with exclusive breastfeeding. For the 24-h recall, women with a secondary education (model 1) were more likely to have exclusively breastfed their child [OR 1.79, CI 95% (1.11; 2.86), s.s., model 1] compared to those with less than secondary education. Women's wealth index/SES was operationalized as house and car ownership and was positively associated with exclusive breastfeeding. In this respect, mothers owning a car were almost twice as likely to breastfeed exclusively [OR 1.94, CI 95% (1.12–3.36) s.s., model 1] than mothers who did not own a car. Car ownership lost its statistical significance in the second model, whereas women owning a house were almost four times more likely to breastfeed exclusively [OR 3.96, CI 95% (1.02; 15.49), s.s., model 2] than those who rent an apartment. Mothers whose partner supported the current infant feeding method had an OR of 2.18 [CI 95% (1.26; 3.79), s.s., model 1] for exclusively breastfeeding compared to mothers lacking partner support in this respect, but the association did not prove significant in the multivariate analysis.

The study was very well reported and highly intelligible. Regarding its conduct, the infant population was well defined. A selection bias was introduced through the convenience sampling method. Information bias was enhanced by the cross-sectional study design, but was reduced by minimizing recall bias, as data were cross-checked with the 24-hour recall. The fact that questionnaires were answered with the support of an interviewer might have led to an interviewer bias. Two out of six pre-established confounders (intention to BF and mode of delivery/home or clinic birth) as well as three out of 18 social determinants (maternal educational level, wealth index and social networks) were taken into consideration. Funding sources were not disclosed, and authors did not declare any conflict of interests. The study quality was rated as 'acceptable'.

#### Danso, 2014

Danso (2014) conducted an observational, cross-sectional study to examine the exclusive breastfeeding behavior of professional working mothers in the Kumasi Metropolis. Study participants were identified through purposive sampling, and among them 1000 mothers were randomly selected. Selection criteria for mothers

were: age up to 40 years, full-time employment in the Kumasi Metropolis, and their infants' age ranging from six to 24 months. Preterm children, multiple births, infants with a birth defect or a chronic disease were excluded. The research instrument was a questionnaire with uniform instructions and explanations to be filled in a confidential setting. Frequencies (in %) were calculated. Regarding the area of employment, mothers were working in the following sectors: 17% in ministries, 13% in education, 12% in health, 11.5% in banking, finance and insurance, 9% in civil societies, 8.5% in media/information as well as security agencies, 5.5% in telecommunication and 8% in other areas. Exclusive breastfeeding practice was the primary outcome.

All mothers were familiar with the WHO definition of exclusive breastfeeding (infant receiving solely breast milk and no other liquids/water/solids except oral rehydration solution, drops/syrups containing vitamins, minerals or other medicines). About half of respondents had breastfed their child exclusively. Regarding employment status, 90.5% of respondents stated that their work status was the main barrier to exclusive breastfeeding. Half of the mothers confirmed that their child had to be cared for at home due to pressure at work, and almost a third answered that there was not enough time to breastfeed their infant at work. The fact that employers did not provide a space to breastfeed was an additional barrier at the workplace for 17.5% of the mothers. As a consequence of the obstacles described above, mothers either have to go home or family members bring the child to their workplace to be breastfed.

The study was well reported and intelligible, and the infant population adequately defined. Due to the purposive sampling strategy a selection bias occurred, that was diminished by the subsequent randomization of participants. An information bias was introduced due to the fact that children were six to 24 months old, the period where exclusive breastfeeding is usually not practiced anymore and the cross-sectional study design. The possibility to fill the questionnaire in a confidential setting reduced the selection bias. However, the place of recruitment was neither further specified, nor further details disclosed regarding the research instrument. The period of data collection had to be concluded from the data presented in Table 1, where the source was given as "field survey, 2013" on p. 9. No

confounders were addressed due to the fact that analysis was restricted to the calculation of frequencies. Neither research funding sources, nor the presence of a conflict of interests were disclosed. The study quality was rated as 'low'.

Gladzah, N., 2013

The third of the observational, cross-sectional studies was a Master Thesis elaborated for the University of Ghana and aimed at identifying factors that are associated with exclusive breastfeeding in female health workers in the Greater Accra Region. Data were collected from May to June 2012, and recruitment took place via purposive and subsequently convenience sampling at two hospitals. The original selection criteria aimed at including physicians only, but due to the low participation rate among this professional group, eligibility for study inclusion was extended to the entire health staff employed in the hospital, consisting of pharmacists, nurses, health care assistants, administrators, laboratory technicians, radiologists, and physiotherapists. Regarding the infant population, at first only children until age five should be included, but the inclusion criterion for child age was increased to ten years in order to raise the sample size. Finally, 163 health workers aged 15 - 49 years with children aged between six months and ten years old could be included in the study. The data collection took place in two hospitals, with roughly twice as many study participants being recruited from Hospital no. 2 compared to Hospital no. 1. The research instrument was a pre-tested questionnaire that could be filled in with the support of an interviewer. Filled questionnaires were collected every evening at 5.00 pm, and the option to send it via email to the researcher was not used. Exclusive breastfeeding was defined as to whether mothers had not fed any liquid or semi-solid or solid food except breastmilk in the first six months after birth and was primary outcome of the study. Frequencies (in %) were calculated, followed by Chi-Square tests and logistic regression to determine the factors with the strongest influence on exclusive breastfeeding.

Almost one third of respondents had breastfed exclusively for less than six months, and two thirds for the period of six months respectively. Among mothers with secondary education, 86.1% breastfed exclusively compared to 13.9% who did not exclusively breastfeed for half a year. Two thirds of mothers with tertiary

education breastfed exclusively, compared to one third who did not exclusively breastfeed (s.s.). However, mothers with a tertiary education were not statistically significantly less likely to exclusively breastfeed compared to their peers with a secondary education. As for wealth index/SES, almost three quarters of women gaining a salary of less than 1000 Ghana Cedi were exclusively breastfeeding for six months, and 28% of the same income group did not (s.s.). Half of women earning more than 1000 Ghana Cedi per month practiced exclusive breastfeeding for six months, and the other half did not (s.s.). Mothers with a higher income level were less likely to breastfeed exclusively compared to those earning less. As for working conditions, 55.8% of women reported that their work schedule was not compatible with exclusive breastfeeding. Regarding workplace regulation, 65.4% of respondents stated that there was no proper space available for breastfeeding, and 71% to not dispose of a one-hour break for breastfeeding during work.

The study was very well described and highly intelligible. Regarding its conduct, the population of infants was not described in detail. A selection bias might have occurred with both sampling methods, as well as an information bias since the recall period was up to ten years. Three out of seven pre-established confounders were taken into account, namely parity, mode of delivery and supplementary feeding, as well as eight out of 18 social determinants. There was no further information on funding support or conflict of interests and the study quality was rated as 'acceptable'.

## **Ghana: Study Description for Qualitative Research Design**

Aborigo, et al., 2012

The observational study with a qualitative research design was conducted by Aborigo et al. in 2012 and aimed at exploring mothers' experiences with breast-feeding initiation and supplementation, as well as whether there are cultural practices that impact on infant feeding in the first seven days after birth. The study area was the Navrongo district located in Northern Ghana, from which one region was randomly selected resulting in two ethnic groups being included in the study, i.e. the Kasem and Nankani. The area is predominantly rural. Data collection took place from July to November 2010. In order to keep with explorative methodology, no sample size calculation was performed and a sampling strategy was developed to maximize the diversity of participants' characteristics. From the information given it is presumed that a purposive sampling strategy was used. Key community informants selected a sample of 35 mothers based on a list of members with newborn infants aged four to eight weeks, which was further divided into two groups. The first one consisted of mothers with newborn babies aged one month, and the one was selected according to literacy, place of delivery, and number of previous deliveries to increase the diversity of mothers. Among the first group, women were selected who could be contacted immediately after their child reached 29 days of age, while the other group consisted of women with early neonates aged seven days. In-depth interviews were conducted with both groups of the entire sample, and an additional eighteen in-depth interviews with community leaders, thirteen with formal health care providers (physicians, nurses, midwives, medical assistants) and eight with traditional health care providers (TBAs, herbalists). Moreover, focus group discussions were conducted with community members as follows: eight focus group discussions with grandmothers having at least one grandchild born in the previous year, two with compound heads and eight with head of households. Interviewers had been trained before, and were mostly Ghanaian students not from the area, but fluent in the local languages, besides two students from the United States of America. Interview guides had been pretested, and all interviews took place in participants' homes. The interviews with mothers lasted approx. 45 to 60 min. Analysis was conducted

through "in vivo" coding by developing an initial coding structure and a codebook. Data were then analyzed with the qualitative software analysis NVivo 9.0. The initial coding served as a coding basis, and four students coded individually until saturation was reached. Meetings were held on a regular basis to resolve discrepancies. Breastfeeding indicator was onset of breastfeeding, and the primary outcome.

In formal healthcare settings, most women started breastfeeding 30 to 60 minutes after delivery, whereas in a home birth setting initiation of breastfeeding was delayed for 72 to 96 hours postpartum. Regarding the social determinant gender of infant, for first time mothers' breastfeeding initiation was delayed for three days for male, and four days for female babies. As for social networks, delivering outside the hospital was an obstacle for women to immediately start breastfeeding or maintaining exclusive breastfeeding in the face of competing advice from TBAs, grandmothers, and other community members, although all of them demonstrated good knowledge of breastfeeding recommendations and the importance of breast milk. Besides, first time mothers had to undergo a ritual test of their colostrum, and if the result was negative, the colostrum was not allowed to be fed. The newborn was either fed by a wet nurse or herbal teas, but community members expressed their anxiety because of the risk to possibly transmit a disease through infected breast milk.

The study was well described, but not very intelligible. Regarding the infant population, gestational age was not disclosed, and the purposive sampling strategy introduced a selection bias. An information bias was possibly introduced because interviewers were strangers to the area. The validation of the research instrument was not described. Four pre-established determinants were addressed, i.e. parity, mode of delivery (home or clinic birth), early infant-to-breast contact, and supplementary feeding, and six out of 18 social determinants. The study quality was assessed as 'acceptable'.

Otoo et al., 2009

The observational, qualitative study conducted by Otoo et al. (2009) investigated the knowledge and attitudes towards breastfeeding as well as actual breastfeeding behavior among women in the Manya and Yilo Krobo district located in the Eastern region of Ghana, an area with peri-urban communities, where income is generated through farming. Participants were recruited at three antenatal clinics in the Manya Krobo district, where voluntary counseling and testing for HIV during pregnancy was offered through the “Research to Improve Infant Nutrition and Growth (RIING)” project for improving child health/nutrition in HIV affected communities. In total, 35 women with infants below four months of age who had partly received information on exclusive breastfeeding beforehand were included into the study, with seven HIV positive mothers, twelve HIV negative and 16 with unknown HIV status among them. Four focus group discussions (FGDs) were conducted each Monday in June 2006 with seven to ten women per group. The interviews took place at the office of the RIING project. The interview guide had been pretested with a population sharing the characteristics of the study participants, and addressed the following major topics: knowledge on exclusive breastfeeding, sources of information received in ANC, and expected consequences of early cessation of exclusive breastfeeding. Aside from that, participants’ perceived benefits, incentives and barriers to exclusive breastfeeding were researched. With the purpose to reduce social desirability bias, women explained the breastfeeding behavior of other mothers in the community. The research team consisted of the study coordinator, the moderator and the facilitator fluent in the local languages Krobo and Akan, an interpreter fluent in Ewe, as well as a technical assistant and another assistant who took care of infants during interview sessions. The breastfeeding indicator was time of introduction of solid foods, and was primary outcome. FGDs lasted approximately two hours and were audio-taped, then transcribed verbatim and translated into English. Results were analyzed using the Microsoft software WORD and EXCEL. Coding was carried out according to a codebook that had been developed beforehand. Codes displaying similarities were arranged together in order to identify the themes that came up during the FGDs. Similar concepts were then aligned to develop common themes. Each statement subject to coding was analyzed according to social

context, occurrence, precision and amount of answers, and how often similar words or phrase had been recorded.

From the sample, 35 mothers were aged 19-49 years, and 32 women were employed, while 17 were traders and three unemployed. They had 3.6-7.2 years of education, and 30 of them were cohabiting with a partner or spouse. Working mothers proved to be well knowledgeable about the definition and importance of exclusive breastfeeding, having received that information at ANC services. Regarding the social determinant social networks, mothers reported to be exposed to conflicting messages about infant feeding from their family members, friends and peers, especially if they were present during breastfeeding. As a consequence, exclusive breastfeeding was interrupted by the feeding of water. Concerning culture, women reported that they are hesitant to breastfeed in public. As for workplace regulation, they also reported that it was difficult for them to exclusively breastfeed since they did not dispose of enough time and an appropriate location to breastfeed at their workplace, especially for women who made their living by selling products at the market and have to advertise for them. Formally employed mothers complained that maternity leave was too short to reach the period of six months of exclusive breastfeeding.

In respect to reporting, the study was very well described and highly intelligible. Concerning the conduct, the infant population was not well described, and the sampling strategy remains unclear as to whether it was convenience or purposive sampling, but in either case it might have led to a selection bias. The ethnicity of the research staff was not disclosed and might have introduced an interviewer bias. Transcripts had to be translated into English, possibly leading to a loss of information. The internal validity was increased by reducing the social desirability bias. Four out of 18 social determinants had been addressed in this study, and none of the pre-established ones. Funding resources were not disclosed, and there was no declaration regarding authors' conflict of interests. The study quality was rated 'acceptable'.

Tawiah-Agyemang et al., 2008

The observational study conducted by Tawiah-Agyemang et al. (2008) had a qualitative research design applying formative research. It aimed at investigating the reasons for recent mothers to start breastfeeding early or late after birth in Ghana, who influences the decision and what kind of supplements are fed when onset is delayed. Data were collected from March to June 2005 in the study area of the Kintampo district, which is located in the Northern part of Ghana and is highly rural. Study participants had been recruited from the ObaapaVitA study, a large community-based, cluster-randomized, placebo-controlled trial exploring the impact of weekly vitamin A supplementation on maternal mortality that started in 2000. A sample of 246 women were selected through convenience sampling after two months postpartum, and out of them 52 mothers were chosen purposively on the basis of timing of onset of breastfeeding, and variations in factors like place of birth, parity and ethnicity in order to increase the diversity in study participants' characteristics. Data collection was done iteratively, since the interview guide had been developed through eight FGDs held with women of child-bearing age, conducted from March to May 2005 in order to collect data on cultural norms regarding breastfeeding. In June 2005, trained fieldworkers conducted semi-structured interviews in the local language Twi with 52 recent mothers having an infant up to two months of age. In August 2006, 13 semi-structured interviews with health workers, policy makers and implementers were conducted. Transcripts were subsequently translated into English and field notes transformed into English transcripts. For the data analysis, two lead researchers independently identified themes in a systematic way. Results were then discussed until discrepancies had been resolved. Breastfeeding indicator was the onset of breastfeeding, reported at maximum eight weeks after birth.

Five out of 50 women who had attended ANC services had received information on early initiation of breastfeeding, and 35 mothers had fed colostrum after birth, 9 mothers had squeezed it out, and for eight mothers no classification was possible. As for the social environment, advice for early initiation was given to two women by friends and/or family, but usually only to first-time mothers. Furthermore, both mothers and health-workers reported that the delay in onset of breast-

feeding occurred due to "lack of breast milk, post birth activities, baby not crying for milk, mother needed rest."

Regarding the social determinant maternal age, one fourth of mothers were aged below 20 years, a third between 21 and 30 years, and 42% 31 to 45 years. Very young mothers had a delayed onset of breastfeeding in both health services and home delivery. As for the social determinant social networks, it was mainly the family members that exercised an influence on early onset, especially in the case of first-time mothers. A woman who had delivered before was not given advice because she was considered to be experienced. The main result for the social determinant culture was that in the Northern region beliefs like there "is no milk" or that colostrum is not good for the newborn are particularly strong, and thus breastfeeding usually does not start until three days after birth.

Regarding reporting, this study was very well described and highly intelligible. The population of infants was not well defined, and a selection bias was introduced through the convenience and subsequently purposive sampling method. A recall bias was reduced because mothers were interviewed up to eight weeks after delivery, and the internal validity of data was enhanced through the iterative development of the interview guide. The three (out of seven) pre-established determinants parity, mode of delivery (clinic versus home birth) and supplementary feeding were addressed, as well as eight out of 18 social determinants. Sources of funding were not disclosed, but Z. Hill had been working for the Gates foundation as a consultant, and B. Kirkwood was granted financial aid from DFID, USAID, Saving Newborn Lives, WHO, and had participated in the Vikram Patel Welcome Trust Senior Clinical Research Fellowship in Tropical Medicine and the Dominique Behague Welcome Trust Research Development Fellowship. All other authors declared no conflict of interests. The study was rated 'high quality'.

## **Annex C4: Reporting of Data of Results by Country**

### **Country 1: Germany**

#### **Micro level**

#### **Question 1: How does maternal age influence the breastfeeding period in the given social context in Germany?**

None of the studies provided information on the social context.

#### **Bergmann et al., 2002**

Maternal age influenced breastfeeding with a positive relationship between increasing age and breastfeeding duration. There was no information provided as to which age groups are defined as older, nor a specific explanation offered except that other factors also exercise an influence (eczema of one or both parents, a high social status of the mother and that the mother did not smoke during pregnancy as one among them).

#### **Dulon et al., 2001**

Younger mothers below the age of 25 years were 3,5 times more likely to breast-feed shorter than four months compared their older counterparts.

#### **Dulon, M.; Kersting, M.; Bender, R., 2003**

Mothers below 25 years have an OR of 4.69 to breastfeed shorter than older mothers.

#### **Libuda, L.; Stimming, M.; Mesch, C.; Warschburger, P.; Kalhoff, W.; Koletzko, B.; Kersting, M., 2014**

As for exclusive breastfeeding, almost half of mothers aged 18–29 years breast-fed exclusively for four months, compared to about 60% in the age group of 30–32 years, women aged 33–36 years had the highest share of 63%, followed by 59% in the last age group 37–50 years. It is important to note that mother's age did not predict initiation of breastfeeding after inclusion of social status.

Pflüger, M.; et al. 2010

Children of younger mothers were exposed to solid foods earlier than children of older mothers. Women aged 20–29 years had an average of breastfeeding duration of 4.2 months, followed by 5.8 months of age group 29.1–32 years, and both age groups of 32.1–35 and 35.1–42 years had an average duration of full breastfeeding for six months. The sample consisted of infants born to either a diabetic mothers or who have a diabetic father/sibling. It is known that diabetic mothers have shorter breastfeeding periods in general, as well as higher smoking rates.

Soto-Ramírez & Karmaus, 2008

Mothers below 20 years had a median duration of breastfeeding for eight weeks, age group 20–24 years nine weeks, age group 25–29 years twelve weeks, and those aged over 30 years had a median of 16 weeks. Authors explain the effect partly by the use of hormonal contraceptive interacting as an endocrine disrupter leading to a shortened breastfeeding period or lifestyle-related factors.

Weißborn, 2009

Young maternal age at birth is associated with a breastfeeding period below four months. Young women aged up to 25 years were 5.28 times more likely to breastfeed less than four months, and four times more likely to not continue breastfeeding for more than 6 months compared to older women.

**Question 2: How does maternal educational level influence the breastfeeding period in in the given social context in Germany?**

None of the studies provided information on the social context.

Dulon et al., 2001

Maternal educational level was associated with short term breastfeeding under four months, with mothers who received ten years of schooling at most being more than 2.5 times more likely to breastfeed short term compared to mothers with a higher educational level.

Dulon et al., 2003

Women with a secondary educational level were three times more likely to breastfeed for less than 4 months compared to mothers with a high educational level.

Weißborn, 2009

Mothers with a lower secondary education were about 5.5 a half times more likely to breastfeed for less than four months compared to mothers with a secondary educational level, who were still 3.5 times to breastfeed shorter than more educated women. As for a breastfeeding period of six months, mothers with no or primary schooling were 4.5 times more likely to not breastfeed for that period compared to those with a secondary education, who were three times more likely to not breastfeed for that period compared to those who had received a higher education.

**Question 1 and 2: relationship of maternal age and maternal educational level**

Women younger than 25 years with a lower secondary educational level were six times more likely to breastfeed for less than six months, and those with a secondary educational level still three times. This effect is enhanced by little or no previous breastfeeding experiences. Thus, young maternal age at birth is associated with shortened breastfeeding periods exacerbated by low educational status.

**Question 3: How does SES influence the breastfeeding period in the given social context in Germany?**

None of the studies provided information on the social context.

Bergmann et al., 2002

The higher the social status of a mother, the more likely she was breastfeeding for a longer time. Social status was calculated through education, occupation and household income, but in 90% that of the father.

Libuda et al., 2014

Women with a high social class were most likely to start breastfeeding and to breastfeed exclusively for up to four months, followed by those with a middle social class who were more likely to breastfeed exclusively compared to those with a low social class, were least likely to start and to breastfeed exclusively. Social class was calculated through level of maternal school and professional education, as well as household income.

**Question 4: How does the status of one-parent family influence the breastfeeding period in the given social context in Germany?**

None of the studies provided information on the social context.

Dulon et al., 2001

Mothers who lived as one-parent families were almost three times more likely to stop breastfeeding prior to four months compared to those who were married/cohabitating, whereby mothers from the Eastern regions in that study were more likely to be single parents. One reason suggested was not enough time spent on infant–mother interaction, which is essential to sustain breastfeeding.

Weißborn, A., 2009

Mothers living as one-parent families had an almost four-fold elevated odds to breastfeed less than four months, and those who reached that period still had an 3.5 times increased chance to stop breastfeeding before six months compared to married/cohabitating women. One-parent family poses a highly significant risk factor regarding the duration of breastfeeding.

**Question 5: How does employment status influence the breastfeeding period in the given social context in Germany?**

The study did not provide information on the social context.

Dulon et al., 2001

East German mothers displayed a shorter breastfeeding period than West German mothers, which is most likely caused by the fact that due to employment policy in the former GDR mothers used to return to work soon after birth in general and possibly for economic reasons originating in the income gap.

**Question 7: How does gender of infant influence the breastfeeding period in the given social context in Germany?**

The study did not provide information on the social context.

Weißborn, 2009

Male infants were 1.75 times more likely to be breastfed for less than four months 1.5 times for less than six months compared to female infants.

**Question 10: How does geographical location influence the breastfeeding period in the given social context in Germany?**

None of the studies provided information on the social context.

Dulon et al., 2001

Mothers of East German upbringing displayed higher rates for onset of breastfeeding, but lower rates in exclusive breastfeeding and were twice as likely to breastfeed short-term compared to their West German counterparts.

The reasons stated by mothers were insufficient breast milk and the need to return to work soon after birth. Other reasons might result from the fact that newborns had later breast-to infant contact in the former GDR, and there were higher rates of supplementary feeding and of pacifier use in East German hospitals.

Libuda et al., 2014

Comparing the geographical areas of Germany, 88% East German mothers compared to 75% West German mothers.

### Meso level

#### **Question 11: How do social networks influence the breastfeeding period in the given social context in Germany?**

One study provided information on social context.

##### Wehrstedt, 2014

Social context: home environment

Essential for successful breastfeeding beyond one year is support through the husband.

*He has always supported me, and helped me lots, particularly in the beginning with all that trouble.*

Having breastfed for approximately one year, the significant members of the social environment express their disregard regarding prolonged breastfeeding.

*Most of my environment is rather against it and argues this is spoiling the child, attaching the child too much to the mother, and that it is "unhealthy" for the mental state of the child.*

##### Dulon et al., 2001

Mothers with an upbringing in West Germany were almost 2.5 times more likely to breastfeed for less than four months if their partners had a negative attitude towards breastfeeding and were not willing to support them in regards to breastfeeding compared to East German mothers.

##### Weißborn, 2009

Mothers whose partner's attitude towards breastfeeding was unclear or negative had an increased chance of 5.69 to practice short term breastfeeding compared to those being assured of their partner's supportive attitude, and those who managed to surpass that period were at increased odds of 3.76 to stop breastfeeding prior to six months.

### **Macro level**

**Question 13: How does culture influence the breastfeeding period in the given social context in Germany?**

Wehrstedt, 2014

Social context: health services

The medical culture represented by health professionals such as pediatricians might oppose breastfeeding beyond a year.

*My doctor lately said I would have to wean both kids immediately, as it will disturb their psychological development. He was shocked when I told him that I still breastfeed both kids, and said it is a psychological disturbance on the mother's side to breastfeed that long, and that the children would not need it any more.*

## Country 2: United Kingdom

### Micro level

#### **Question 1: How does maternal age influence the breastfeeding period in the given social context in the United Kingdom?**

One study provided information on the social context.

#### Dykes et al., 2003

Social context: health services

Adolescent mothers were in need of five types of support in order to establish a successful lactation: emotional, esteem, instrumental, informational, and network. The last one is not presented here, but under question 11 (social networks).

The type of support that was conditional for the others to be acceptable was esteem support. These are examples for provision of support types in health services:

**Emotional support:** *the expression of empathy, caring, and concern toward the person*

*I wasn't asked how I was feeding. I was asked how many ounces is he having . . . then when I said I was breastfeeding they like looked and said "oh you're breastfeeding" and I was like . . . "yes" and they said "oh . . . that's good".*

**Esteem support:** *positive regard for the person, encouragement and agreement with the individual's ideas or feelings.*

*They (midwives) said "you're doing really really well" and that's when I really wanted to persevere with it.*

*If they had encouraged me a bit more when I was thinking about putting him on the bottle . . . like said why don't you give it another day I would have carried on . . . but they were just well . . . it's up to you.*

**Instrumental support:** *direct assistance of a practical nature*

*It was a bit pushy. I think they were coming in every half an hour to check, trying to get me to breastfeed a lot. There was a lot of pressure. I didn't get much help with the practical side of it at all.*

*They helped me get him on and then they were gone again.*

Bishop et al., 2008

Mothers from younger age groups (20-24) were much less likely to breastfeed compared to other age groups.

Brown et al., 2010

Mothers that breastfed for a longer time were likely to be of older age.

Oakley et al., 2014

The older the women, the more often and the longer they were breastfeeding. Compared to older age groups, younger mothers (16-19 years) started breastfeeding less often, and if yes, were more likely to cease at ten days. Those that breastfed beyond that period also stopped breastfeeding more often at six weeks.

Brown & Lee, 2011

Attitudes and beliefs towards breastfeeding seemed to be of more importance than maternal age of mothers at birth.

*I feel proud of myself and pleased that my baby has had the best possible start in life. But I also feel sad that I feel proud - it should be the norm not the exception.*

Cooper et al., 1993

Mothers with a working class background had shorter breastfeeding durations irrespective of their age, compared to middle class women where mainly younger women breastfed for a shorter time. A strong influence on a shortened breastfeeding period occurred if the mother had an episode of depression after childbirth.

**Question 2: How does maternal educational level influence the breastfeeding period in the given social context in the United Kingdom?**

None of the studies provided information on the social context.

Brown et al., 2010

Mothers that breastfed for a longer time had a higher educational level.

Cooper et al., 1993

Mothers that held less than an A-level school graduation diploma (Abitur) from school were less likely to breastfeed for a shorter period.

Lawton et al., 2012

Mothers that had an educational level below O-level school graduation diploma (Fachabitur) were significantly less likely to not start breastfeeding at all, and if yes, to breastfeed for a shorter period independent of their ethnicity (White British/South Asian).

**Question 3: How does SES influence the breastfeeding period in the given social context in the United Kingdom?**

None of the studies provided information on the social context.

Bishop et al., 2008

The higher the occupational level of a woman, the more likely she was to breastfeed.

Cooper et al., 1993

Working class' mothers breastfed for shorter periods compared to middle class women, where mainly young mothers had shorter breastfeeding periods.

Brown et al., 2010

The duration of breastfeeding was inversely associated with a low SES as well as a high level of the Multiple Deprivation Index.

Oakley et al., 2014

The more a mother was deprived according to Multiple Deprivation Index, the less likely she was to initiate breastfeeding, and in case she did, breastfed for a shorter period compared to less deprived women.

**Question 4: How does one-parent family influence the breastfeeding period in the given social context in the United Kingdom?**

None of the studies provided information on the social context.

Bishop et al., 2008

Mothers living in a partnership had a higher tendency to breastfeed more often compared to mothers that lived in a one-parent family.

**Question 6: How does ethnicity influence the breastfeeding period in the given social context in the United Kingdom?**

None of the studies provided information on the social context.

Lawton et al., 2008

Mothers of White British ethnicity were three times less likely to start breastfeeding compared to South Asian women, and if yes, two times to breastfeed for less than six months. However, this effect was mediated by the intention to breastfeed that was more pronounced in mothers from South Asia compared to their White British counterparts.

Oakley et al., 2014

Ethnic white women were less likely to initiate breastfeeding, and if they started, less likely to continue.

### **Meso level**

#### **Question 11: How do social networks influence the breastfeeding period in the given social context in the United Kingdom?**

One study provided information on the social context.

Brown & Lee, 2011

Context: home

Mothers that had breastfed exclusively for six months pointed out that they would not have been successful without the support of their family members.

*My family were always supportive, more than that, it was just regarded as the normal way to feed my baby.*

A strong emphasis was laid on the partner's support:

*My husband was very supportive. He often tells me how proud he is. When it was hard at the start he did everything else for baby and in the house to allow me to concentrate on feeding and recovering from birth.*

Bishop et al., 2008

One third of breastfeeding mothers confirmed that their own mothers had exercised the highest influence on their choice of infant feeding. Regarding non-breastfeeding mothers, the highest influence was due to lack of awareness. In respect to health services, health professionals were less often considered as important.

#### **Question 1 and 11: relationship of maternal age and social networks**

Context: home

Dykes et al., 2003

Network support: *provides a feeling of membership in a group of people who share interests and social activities*

The adolescent mothers received the strongest and most effective support from their own families, especially their own mothers. On the other side, they reported that they felt watched and judged.

*I think that you always feel that you're being watched to see whether you're able to look after your baby. It puts you in a position of being so nervous about whether you're doing it right 'cause the older people are looking at what you're doing. They don't expect you to be able to do it because you're so young.*

### **Macro level**

#### **Question 13: How does culture influence the breastfeeding period in the given social context in the United Kingdom?**

Two studies provided information on the social context. Culture as a social determinant entailed the following six different dimensions:

##### **Social non-acceptance of breastfeeding:**

###### Earle, 2002

Social context: public

In contemporary society, breastfeeding has turned into a private matter that should be hidden from the public:

*The actual action of doing it wouldn't bother me at all. I would feel embarrassed in front of his family, I would say. Say I was in the middle of town and you get all these mothers that formula feed their babies, or even breastfeed them, I couldn't breastfeed a baby in the middle of town.*

###### Gatrell, 2007

Social context: public

Women report that it was not possible for them to breastfeed in public. Estelle was made so unwelcome that she was asked to leave public spaces.

*Jack brought the baby to me and I used to go into this cafe´ which I had previously supported. But one day I breastfed my baby daughter in there. And they asked me to leave and not to come back...*

### **The norm to formula feed:**

Bishop et al., 2008

More than two thirds of mothers answered that “the norm” to formula feed had influenced them in regards to their infant feeding decision represented through public attitudes and public facilities. When divided into breast and bottle feeding mothers, out of those who reported “the norm” to be influential on their infant feeding method, all mothers were bottle feeding compared to those that mentioned tradition as influential, where almost three quarters were breastfeeding.

Earle, 2002

Women felt that historically breastfeeding had been normal, an “ordinary everyday experience”, which has been replaced by formula feeding.

*My mum breastfed all of us, I was 12 when my brother was born, so actually I had some experience of seeing a baby and it being breastfed.*

### **Positive attitude of the mother towards breastfeeding:**

Lawton et al., 2012

Mothers having a positive affective attitude towards breastfeeding in combination with enhanced intention to breastfeed were more likely to start breastfeeding. This was more pronounced in women from South Asia, who expressed that already in pregnancy they perceived breastfeeding as a pleasant, enjoyable, and convenient thing to do.

Sittlington et al., 2007

Women with an attitude favorable towards breastfeeding had higher breastfeeding rates after childbirth (90%), as well as at discharge from obstetric care (78%), as opposed to one fifth that formula fed their infants. Mothers favoring formula feeding practiced this actually to a high extent (95.2%), and only a small minority (8.1%) tried breastfeeding directly after birth, that diminished to half at discharge (4.8%). Among those mothers that had not decided yet upon the infant feeding method of their child, only one third of mothers actually breastfed compared to two thirds that bottle fed.

**Family culture:**

Brown & Lee, 2011

Women having exclusively breastfed for six months reported that they had at least one family member who has breastfed for a longer period of time. In most cases, this was the mother or mother-in-law.

**Body culture:**

Earle, 2002

Social context: public

In present-day society, breasts have turned into a sexualized symbol, and do not represent a source for infant feeding anymore.

*I wouldn't do it in public. I couldn't get my body out anywhere for anybody. It is more private, isn't it?*

Gatrell, 2007

Social context: work

Mothers that were breastfeeding and returned to work stopped because of the challenges they felt not to be able to cope with. This was due to several reasons, among others the need of *managing their lactating bodies, especially leakage of milk*.

*When I first went back to work, I wanted to return initially for 3 days per week so I could breastfeed, but permission was refused. I think they thought this would stop me breastfeeding, which they said was 'unsuitable' at work. I think they were worried about leakage and I was anxious about this as well, it's like: 'how do you control all this milk?'*

**Medical culture:**

Gatrell, 2007

Social context: health services

Women narrate about their unexpectedly unpleasant birthing experience in health services impairing lactation, about which they express their emotional concern.

*I had this dreadful, shocking hospital delivery, then enormous problems breast-feeding him, so I didn't enjoy and gave up. But I felt so guilty [...].*

**Question 14: How does religion influence the breastfeeding period in the given social context in the United Kingdom?**

Williamson & Sacranie, 2012

Social context: health services

A woman reported that she received information provided in ANC which were identical with information that she had received attending religious services.

*I went for these antenatal classes where they [midwives] gave me leaflets on breastfeeding with diagrams (...) They were promoting breastfeeding a lot now as well as talking about the same benefits that I knew from going to the mosque.*

**Question 15: How does workplace regulation influence the breastfeeding period in the given social context in the United Kingdom?**

Gatrell, 2007

Social context: work

There was no provision of an appropriate space to breastfeed and/or express and store breast milk:

*Breastfeeding? In school? Putting breastmilk in the staff fridge? You're joking. You can smell the testosterone when you walk in the door and you have to fit in, which obviously you can't do if you're breastfeeding [...].*

*Diana, a television news producer, returned to employment when her daughter was almost 5 months old, having breastfed exclusively until this point. There was nowhere in the newsroom to accommodate the expressing of breastmilk and she found it difficult to 'hide somewhere'.*

*Estelle recounted how, when she was running clinics, there were no facilities for breastfeeding. Nobody enquired how she was managing to combine work with new motherhood and Estelle took this as a sign that she should breastfeed secretly.*

**Question 16: How does parental leave influence the breastfeeding period in the given social context in the United Kingdom?**

Gatrell, 2007

Social context: work

The period of legal maternity leave in the UK does not cover the recommended period of six months to breastfeed exclusively. Women reported that on returning to their workplace, they had to stop breastfeeding.

*[...] I hated giving up and [baby] cried because she wanted me, but I had to get back to work and the Head was not best pleased with me anyway, being off on maternity leave. So I needed to work at fitting back in, so breastfeeding was out of the question.*

Though employers eventually grant extra (unpaid) time off for maternity leave, six months were not reached.

*I had a terrible few weeks trying to prepare myself. I had four months maternity leave and when you have this little person and you're breastfeeding exclusively, it's a wonderful sort of bonding thing, it's very intimate and I didn't want to leave him. [...] it took me months to adjust and stop feeling resentful against them because they had made me give up breastfeeding.*

Due to the increased economic pressure, one woman was even reluctant to take the legally granted period for maternity leave.

*Estelle, a psychotherapist, also continued to feed her baby directly from the breast during the working day. When her daughter was born, Estelle was in a new post in which vocational training was an integrated part. Estelle feared that taking maternity leave would compromise her chances of continuing as a psychotherapist and she thus returned to work when her daughter was 3 weeks old.*

### **Country 3: Ghana**

#### **Micro level**

**Question 1: How does maternal age influence the breastfeeding period in the given social context in Ghana?**

Tawiah-Agyemang et al., 2008

Context: home

A 15-year old woman who gave birth at home had started breastfeeding 54 hours after her delivery.

*The breast was flat and she realized that nothing came out of it.*

In rural/traditional areas, mothers with newborns follow the advice of either nurse or traditional health staff/family members, whereby young women seem to be a risk group for delayed onset especially in a home birth setting. Health facility delivery had a positive impact on early onset in general.

**Question 2: How does maternal educational level influence the breastfeeding period in the given social context in Ghana?**

None of the studies provided information on the context.

Aidam, et al., 2005

Mothers with less than secondary education were about half as likely to exclusively breastfeed as compared to those with at least secondary education.

Gladzah, 2013

Health workers with a tertiary education seem less likely to exclusively breastfeed than health professionals with a secondary education.

**Question 3: How does wealth index/SES influence the breastfeeding period in the given social context in Ghana?**

None of the studies provided information on the context.

Aidam et al., 2005

Women who own a house were four times more likely to exclusively breastfeed compared to those renting an apartment.

Gladzah, 2013

The relationship between income level and the practice of exclusive breastfeeding was as such that the higher the income level of the mothers employed as health workers, the less likely they practiced exclusive breastfeeding.

**Question 5: How does employment status influence the breastfeeding period in the given social context in Ghana?**

The study did not provide information on the social context.

Danso, J., 2014

Having received information from health care professionals at PNC services, study participants were well knowledgeable about the WHO recommendations of breastfeeding and the importance of exclusive breastfeeding. Non despite, they have difficulties practicing the entire period of six months with 90.5% of the full-time working mothers stated that their work status was the main barrier.

**Question 7: How does gender of infant influence the breastfeeding period in the given social context in Ghana?**

Aborigo et al., 2012

Social context: home

In the given context of traditional worshippers, onset of breastfeeding was delayed in first-time mothers according to gender of infant. Tradition required that ritual cleansing of the recent mother had to be performed before starting to breastfeed, which lasts three days in the case of male infants, and four days for female infants. Moreover, there was an overlap with another cultural practice in

first-time mothers where the colostrum is subject to a test and in case of a negative test result yet another cleansing has to be performed. Newborns were then nurtured on the basis of tea or through a wet nurse from the neighborhood.

### **Meso level**

#### **Question 12: How do social networks influence the breastfeeding period in the given social context in Ghana?**

Two studies provided information on the social context.

##### Aborigo et al., 2012

Social context: health services

A mother of a newborn who had two or more deliveries said that

*When you deliver in the hospital, you breastfeed and continue at home.*

However, delivering outside the hospital may prevent women from immediately breastfeeding or maintaining exclusive breastfeeding in the face of competing advice of TBAs, grandmothers, and other community members. Members from the social network, especially the paternal grandmother of the child had significant influence in regards to decision-making about how the infant will be fed.

*They have told us that the baby should not drink water until six months but some will ignore that and still give the baby water.*

##### Tawiah-Agyemang et al., 2008

Social context: home

On the other side, a second-time mother having delivered at home started breastfeeding 54 hours after birth reported that

*I didn't get any advice this time because I was old enough to know what to do with my baby.*

Aidam et al., 2005

Mothers who enjoyed their partner's support for the current infant feeding method were more than twice as likely to breastfeed exclusively, but still the attitude of the infant's mother had a stronger influence.

Otoo et al., 2009

Mothers knew from ANC services about the importance of exclusive breastfeeding and were familiar with the WHO definition. But breastfeeding in the presence of family members was reported as challenging since mixed feeding was the norm in the older generation. Conflicting messages from family members and friends could lead to interrupting exclusive breastfeeding and feeding water. The most influential person was represented by the grandmother.

**Question 13: How do working conditions influence the breastfeeding period in the given social context in Ghana?**

Danso, 2014

Social context: work

Although mothers were aware of the importance to exclusively breastfeed, half of the full-time formally employed mothers explained that they were not able to continue this practice after resumption of work, since their infant had to stay at home because of stress levels at the workplace. Women were employed in a variety of areas as education, health, banking/finance/insurance, telecommunication, media/information, civil societies, NGOs, ministries, security agencies, among others.

Gladzah, 2013

Context work:

Among health professionals employed in two hospitals, 6% that had a work load for less than four hours a day compared to 89%, who were working between four and eight hours a day. Half of these mothers stated that their schedule at work was incompatible with practicing exclusive breastfeeding, aggravated by the fact

that colleagues at work would not tolerate them closing earlier from work to breastfeed their infants.

**Question 2, 3 and 13: relationship of maternal educational level, SES and working conditions**

Women with a tertiary education have higher income levels, and are more likely to hold managerial positions, which do not offer the job flexibility to continue with exclusive breastfeeding.

**Macro level**

**Question 14: How does culture influence the breastfeeding period in the given social context in Ghana?**

Aborigo et al., 2012

Social context: home

As already explained under Question 7, first-time mothers had to undergo a ritual cleansing. Aside from that, their colostrum was tested. Both procedures delayed onset of breastfeeding.

*If it is the first time the woman delivers. They will press out the woman's breast milk into a container and put some ants inside it. If the ants die, it means the breast milk is bitter and not good for the baby but if the ants don't die then they will allow it to suck the breast milk.*

The newborns were either fed by a wet nurse or with herbal teas. The first option was considered as challenging, since

*There are so many diseases with us so they (mothers) don't allow other nursing mothers to breastfeed the babies.*

Tawiah-Agyemang et al., 2008

Context: home

During home deliveries the negative beliefs about colostrum could incur a delay in onset and ultimately impede the feeding of colostrum. *She doesn't give the first breast milk to the baby on the first day after birth. She gives the breast milk to the baby the next day after birth when the first breast milk has mixed with the second breast milk.*

*She squeezed the first breast milk away until the white milk came because the former wasn't good. Then she breastfed the baby with the white milk.*

**Question 15: How does religion influence the breastfeeding period in the given social context in Ghana?**

Aborigo et al., 2012

Social context: home

Religion was important regarding the selection of the birth setting as well as adherence to breastfeeding recommendations. During home birth, traditional spiritual leaders were gatekeepers for the decision when an infant was allowed to be breastfed. According to them, on the first day the newborn should not receive anything because the Gods have to be consulted first. Christian communities confirmed that they adhere to breastfeeding recommendations, which they called *the new law*.

**Question 16: How does workplace regulation influence the breastfeeding period in the given social context in Ghana?**

Danso, 2014

Social context: work

Almost one fifth of the full-time, formally employed mothers stated that there was no proper location provided at the workplace to breastfeed their child. Thus, they had either the option to go home during their regular break to breastfeed, or a family member would bring the child to the workplace, so it could be fed there.

Gladzah, 2013

Social context: work

Regarding the workplace regulation at two hospitals, 71% of mothers confirmed that they were entitled to a one-hour break to feed their children. However, 65.4% answered the reason why they discontinued exclusive breastfeeding was the fact that there was no provision of a place suitable for breastfeeding.

Otoo et al., 2009

Social context: work (formal and informal)

The main barrier to exclusive breastfeeding was considered maternal employment. Working mothers stated that they did not have enough time to breastfeed their infants exclusively because of the inability to find a convenient feeding location, especially in the case for mothers who hawk their products or are busy trading in the market.