



وزارة الصحة  
Ministry of Health

Deputyship of Therapeutic Services  
Deputyship for Support Medical Services  
General Administration of Nutrition

# Assessment of National Breastfeeding Indicators

كفالة  
الرضاعة  
الطبيعية

**Final Project Report 2023**

Version 3

(January 2023-December 2024)





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## 1. Summary

The World Health Organization (WHO) recommends exclusive breastfeeding for the first six months of life, and the introduction of safe complementary foods thereafter, with continued breastfeeding for 2 years of age and beyond. The General Administration of Nutrition is coordinating the national breastfeeding promotion program in the Kingdom of Saudi Arabia (KSA). Despite many achievements in breastfeeding protection, support and promotion across all regions and sectors, breastfeeding patterns remain suboptimal in KSA, based on a review of pertinent literature. It is in this context that the Deputyship of Therapeutic Services at the Saudi Ministry of Health has launched a national project on breastfeeding practices assessment. It was carried out as a monitoring (surveillance) to establish baseline data and follow them up with ongoing and future interventions by the Ministry of Health and other collaborative sectors. In order to standardize the methodology for breastfeeding indicators (monitoring), and allow for direct comparison with data collected from other countries in the world, this project adopted the updated 2021 WHO Infant and Young Child Feeding (IYCF) Indicators. More specifically, the project aimed to evaluate the six breastfeeding indicators proposed by the updated WHO guidelines in a representative sample of the population in KSA and identify population groups at risk for poor breastfeeding practices. The six breastfeeding indicators include: Ever breastfed (EvBF); Exclusively breastfed for the first two days after birth (EBF2D); Early initiation of breastfeeding (EIBF); Exclusive breastfeeding (EBF) under six months; Mixed milk feeding under six months (MixMF); and Continued breastfeeding 12–23 months (CBF).

Based on a cross-sectional design, a national assessment was launched on a representative sample of children born in KSA during the past 2 years (from 20 governorates). The project was initiated in February 2023. Data collection was conducted in 2 phases, and was performed via a phone-based interview with the mothers of infants and young children born in the past 2 years. In phase 1, data was initiated on 24 May, 2023 and completed on 31<sup>st</sup> July 31, 2023. In phase 2, data collection was initiated on October 10 and completed on December 21, 2023. A multi-component questionnaire was developed for the project: the questions related to child nutrition were based on the updated 2021 WHO guidance document. A specific logo was developed for the project as the indicators may be collected by several other projects. Prior to the launch of data collection, training sessions were organized to train the field coordinators (one per region or governorate) and the interviewers on conducting the phone interviews and acquiring the needed skills. The collected data was entered via the MOH self-service platform using SHAHM application in phase 1. Given the various challenges identified with SHAHM portal during phase 1, data entry in phase 2 was performed on a pre-developed Excel sheet. In phase 1, the final sample consisted of 3059 children aged 2 years or below, with a refusal rate of 30.3%. Details related to phase 1 are provided in the *First and Second Quarters Project Report 2023*. In addition, there was a sample of n=384 questionnaires collected in phase 1 that could not be extracted from SHAHM due to technical difficulties. These were later extracted and incorporated in the overall analysis in this report. In phase 2, a total of 6550 were invited to participate in the study. Of those, 656 refused to participate. Hence the refusal rate in phase 2 (10%) was 3 times lower compared to phase 1. Data cleaning further resulted in the exclusion



of 95 questionnaires (e.g. answered by fathers (n=87) or child aged above 24 M). Accordingly, the final sample in phase 2 consisted of n= 5799 children aged 2 years or below.

The project's total sample from both phases is n=9242 infants and children aged less than 24 months. Majority of mothers were housewives (76.35%) and had more than 37-weeks-gestation (88.9%). The proportions of mothers who had high school level education (or less) and diploma/university level education were estimated at 36.8% and 55.04%, respectively. A minority were illiterate (3.83%) or had above university level education (4.32%). The children's sample sex distribution was of 51.6% % for boys and 48.4% % for girls. Majority of the children in the sample had the Saudi nationality (88.9%).

Breastfeeding practices were assessed using the 2021 WHO IYCF guidelines. Analyses were weighted by sample weights using 'svy' commands to account for the stratified sampling design and were conducted using Stata. Based on a sample of n = 9242, the following weighted prevalence estimates were obtained:

- 89.3% for ever breastfeeding;
- 43.4% for early initiation of breastfeeding;
- 31.3% for exclusive breastfeeding for the first two days after birth;
- 15.5% for exclusive breastfeeding under six months;
- 34.9% for mixed milk feeding under six months;
- 19.6% for continued breastfeeding in 12-23 months old children.

The national estimates for the various breastfeeding indicators were lower than the global averages as well as averages for the MENA region (calculated based on the UNICEF database). Further comparison was done with the G20 countries, although data was not readily available for all of these countries in the UNICEF database. Accordingly, KSA ranked as:

- 10 out of 12 G20 countries for ever breastfeeding
- 10 out of 16 G20 countries for early initiation of breastfeeding
- Last out of 6 G20 countries for exclusive breastfeeding for the first two days after birth
- Before last out of 17 G20 countries for exclusive breastfeeding under six months
- Before last out of 11 G20 countries for continued breastfeeding in 12-23 months old children

Based on multiple logistic regression analyses, lower odds of meeting the breastfeeding indicators were observed amongst children of Saudi nationality, those who were the first-borns in their family, or were born via Cesarean-section as well as premature children. Although lower education levels amongst mothers were not associated with lower odds of breastfeeding, maternal employment/student status was associated with higher odds of EvBF, EIBF, and MixMF.

These findings may guide the development of culturally-appropriate interventions aimed at promoting breastfeeding in KSA. These interventions may include: a wider implementation of the WHO ten steps to successful breastfeeding; multi-sectoral interventions targeting the identified risk factors for unsuccessful breastfeeding such as first-time mothers, mothers of preterm infants and those who had Caesarian-Section deliveries; further training of health care





staff attending the delivery to support EIBF; addressing culture-specific barriers or misconceptions related to BF among Saudi women; promoting positive breastfeeding attitudes in the society; and evaluation of their effectiveness.

Several challenges were encountered during the project. The readiness of the directorate for the interviews in terms of staff and phones access was limited and required arrangement internally or externally. Other challenges included technical difficulties encountered while using SHAHM in phase 1 and this is why data entry was performed on a pre-developed Excel sheet in phase 2; absence of mother's phone numbers for some newborns from the birth dashboards; the available contact phone numbers were mostly for fathers (but the interviews are expected to be with the mothers except for special situations like maternal death); Fathers' unwillingness to share the mothers' phone numbers; no response or refusal to participate; time pressure to complete data collection within a relatively short timeframe; low data collection in some governorates; These challenges may be overcome by several measures including enhanced readiness for the project; securing a dedicated team for the project; adopting a friendly online platform for data collection; media communication to build confidence amongst the surveyed families; making sure that phone numbers are available in the MOH portal for children within the target age group (especially mothers' phone numbers); availability of dedicated phone numbers for the project; revisiting the data collection procedure and consider shifting it to other governmental sectors such as General Authority of Statistics or to health care centers (hospital and primary care centers) if feasible.

This survey paves the way for subsequent surveys that use the same methodology to assess the trend over time in breastfeeding practices in KSA. It has also fostered the team's expertise and readiness for the planned Kanz breastfeed 2024 and other future surveys.



## 2. Introduction

The first thousand days of life, covering the period between conception and the child's second birthday, is characterized by high epigenetic plasticity and fast development of organs and systems, including the brain, immune and neural systems as well as the gut microbiome [1]. Hence, this period constitutes a unique window of opportunity to shape growth and lay the foundations for future health and optimal development [2].

The World Health Organization (WHO) recommends exclusive breastfeeding (EBF) for the first six months of life, and the introduction of safe complementary foods thereafter, with continued breastfeeding for 2 years of age and beyond [3]. The adoption of these infant and young child feeding (IYCF) practices does not only affect growth and development of infants' vital organs and systems but also plays a key role in programming future health outcomes such as adult onset non-communicable diseases (NCD), morbidity/mortality risk and the quality of life in adulthood [2]. Breastfeeding has in fact been recognized as key to achieve several of the Sustainable Development Goals (SDGs), contributing to improving nutrition (SDG 2); decreasing child mortality and decreasing the risk of NCDs (SDG 3); and promoting cognitive development and education (SDG 4). Breastfeeding was also described as a potential enabler to promoting economic growth, reducing poverty, and reducing inequalities (SDGs 5 and 8) [4]. The World Health Assembly, in its Resolution 65.6, specified a set of six global nutrition targets for 2025, including to "increase the rate of exclusive breastfeeding in the first 6 months up to at least 50%", in comparison with 2012 levels [5]. The global target for exclusive breastfeeding in the first 6 months for the year 2030 has been set to reach 70% [6].

In spite of these recommendations and the well-established benefits of adequate breastfeeding practices, feeding patterns remain suboptimal in many countries of the Eastern Mediterranean Region (EMR). In the Kingdom of Saudi Arabia (KSA), the General Administration of Nutrition is coordinating the national breastfeeding promotion program. Despite many achievements across all regions and sectors, breastfeeding patterns remain suboptimal in KSA, based on a review of pertinent literature [7-12]. It is in this context that the Deputyship of Therapeutic Services at the Saudi Ministry of Health has launched a national project on breastfeeding practices assessment. A specific logo was developed (**Appendix 1**) for the project indicating its importance by word "kanz" in Arabic meaning treasure. It is carried out as a monitoring (surveillance) to establish baseline data and follow them up with ongoing and further future interventions by the Ministry of Health and other collaborative sectors. Prior to setting the specific project objectives and methodology, a mapping exercise was conducted in February-March 2023 to identify national organizations carrying out regular national breastfeeding indicators assessment. A communication was carried out with possible administrations or programs at the Ministry of Health that are involved in maternal and child health to inquire about periodic surveys or monitoring for breastfeeding indicators. These include breastfeeding promotion, child health, epidemiology, nutrition surveillance, maternity care, statistics, and information programs. The General Authority for Statistics was also consulted. The identified programs are listed in **Appendix 2**.



In order to standardize the methodology for IYCF assessment in KSA (for monitoring), and allow for direct comparison with data collected from other countries, this project adopts the updated 2021 WHO IYCF indicators [13]. In fact, to improve IYCF assessment, support programmatic action and contribute to monitoring, the WHO and the United Nations Children’s Fund (UNICEF) recommend the evaluation of IYCF based on the “current status” of feeding among infants and young children less than 2 years of age (i.e. the current age of the child and a recall of what the infant/child has consumed in terms of food and beverages during the 24 hours preceding the interview) [13].

Besides the evaluation and characterization of local patterns of IYCF, it is also important to understand and identify the determinants of IYCF practices in a given population, as a vital prerequisite for the development of effective culture-specific promotion strategies and interventions [14]. Previous studies examining the factors associated with inadequate feeding practices has suggested an association with certain demographic, socio-economic or lifestyle-related factors [15]. For example, delayed initiation of breastfeeding and the lack of exclusive breastfeeding during the first 6 months were influenced by factors such as maternal age [16], maternal education and employment [16], mode of delivery [16, 17], as well as household wealth status [17]. Acknowledging that nutrition early in life is a vital aspect of young child’s health, this project aims to characterize breastfeeding practices among 0–2-year-old children born in KSA and identify the factors associated with inadequate feeding practices in this population. The collected data will serve as a basis for monitoring purposes and will be used for the development of evidence-based and culture-specific recommendations.

The project is planned over the period of one year (in 2023).

### 3. Scope

Surveillance of breastfeeding indicators was carried out on a sample of infant and young children who were born in Saudi Arabia. Knowing that birth in hospitals is high in the Kingdom, the birth registry data were used to select mothers of children who are below 24 months regardless of region, nationality, or place of delivery of health services (i.e. MOH, governmental (non-MOH), or private sectors). A feasible sample for the surveillance will be calculated for each year quarter considering the population pyramid and literature.

Concomitant projects and activities in breastfeeding promotion from all stakeholders are moving forward, in order to assess their effects, while the monitoring of indicators is in place.

### 4. Objectives

This project aims to characterize IYCF practices early in life, at the national level in KSA in 2023. The main objectives are to evaluate the six breastfeeding indicators proposed by the updated WHO guidelines on IYCF [13] (**Appendix 3**) in a representative sample in KSA and identify population groups at risk for poor breastfeeding practices.

As such this project contributes towards the global, strategic, and operational indicators shown below:



<b>Global health indicators</b>	WHO 100 core indicators: 1-Early initiation of breastfeeding 2-Exclusive breastfeeding below six months
<b>Strategic national indicator</b>	MOH: Promote healthy life
<b>KSA Strategic breastfeeding indicator</b>	Exclusive breastfeeding under six months
<b>KSA operational breastfeeding indicators</b>	Early initiation of breastfeeding Exclusive breastfeeding for the first 2 days after birth

The specific objectives of the project are outlined below:

**Objective 1:** To assess breastfeeding indicators in a representative sample of the population in KSA in 2023:

- 1.1. To determine the proportion of children born in the last 24 months who were ever breastfed (EvBF).
- 1.2. To determine the proportion of children born in the last 24 months who were fed exclusively with breast milk for the first two days after birth. [Exclusively breastfed for the first two days after birth (EBF2D)].
- 1.3. To determine the proportion of children born in the last 24 months who were put to the breast within one hour of birth. [Early initiation of breastfeeding (EIBF)].
- 1.4. To determine the proportion of infants 0-5 months of age who were fed exclusively with breast milk during the previous day. [Exclusive breastfeeding (EBF)]
- 1.5. To determine the proportion of infants 0-5 months of age who were fed formula and/or animal milk in addition to breastmilk during the previous day. [Mixed milk feeding under six months (MixMF)]
- 1.6. To determine the proportion of children 12–23 months of age who were fed breast milk during the previous day. [Continued breastfeeding 12-23 months (CBF)]

**Objective 2:** To compare the data obtained for KSA with that reported by other countries using the standardized WHO methodology:

- 2.1. To compare KSA data related to breastfeeding with data reported by other G20 countries and by countries, using the WHO 2021 approach.
- 2.2. To compare KSA data related to breastfeeding with data reported by other countries worldwide and in the Middle-East and North-Africa (MENA) region, using the WHO 2021 approach.

**Objective 3:** To identify the population groups that are at risk for poor breastfeeding practices:

- 3.1. Investigate the association between demographic factors and breastfeeding practices in KSA.
- 3.2. Investigate the association between socioeconomic factors and breastfeeding practices in KSA.



A secondary objective will be the identification of regions in KSA where breastfeeding practices are relatively poorer compared to other regions (subnational comparisons).

The project’s list of outputs is shown in **Appendix 4**.

## 5. Timeline

The project’s timeline is illustrated in the table below:

**Table 1: Timeline Action Plan 2023**

Task	1 <sup>st</sup> quarter			2 <sup>nd</sup> quarter			3 <sup>rd</sup> quarter			4 <sup>th</sup> quarter		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
KPI card (breastfeeding)	[Green bar]											
Approval of the project		[Green bar]										
Assigning a coordinator		[Green bar]										
Label as “Kans Aradea”- كنز الرضاعة الطبيعية												
Writing the project document												
Situation analysis			[Green bar]									
Formation of central core team												
Assigning of representative of regions directorate of health affairs												
WHO collaboration				[Green bar]	[Green bar]	[Green bar]	[Green bar]	[Green bar]	[Green bar]	[Green bar]	[Green bar]	[Green bar]
Questionnaire development (Arabic & English)												
Poster for families												
Sample size determination			[Green bar]						[Green bar]			
Random sampling and computerized list of participants (newborns and their families contact)												
Meeting for protocol discussion				[Green bar]								
Online Training					[Green bar]	[Green bar]				[Green bar]		
Follow up of the regions				[Green bar]	[Green bar]							
Visits to the regions (2 sites)												
Phone Interviews (data collection)						[Green bar]						
Data entry (SHAHM app)												
Preliminary analysis												
Extension for interviews and data entry												
Feedback report from regions												
Writing the progress report					[Green bar]	[Green bar]						
WHO visit (presentation)												
Formation of volunteering team (Digital city)					[Green bar]							
Feedback to child health program (Wellbaby checklist)												
Feedback to statistics authority (Women & child questionaries, result of October survey)												
Final analysis of data												
1 <sup>st</sup> progress report												
Update in the project portal		[Green bar]	[Green bar]	[Green bar]	[Green bar]	[Green bar]	[Green bar]	[Green bar]	[Green bar]	[Green bar]	[Green bar]	[Green bar]
Deliverables												
Final Presentation												
IRB for research												
Survey on effect of the project												
Research project for publication (2024)												



## 6. Stakeholders

The project was developed and implemented in coordination, consultation and collaboration with various international and national stakeholders, as listed below:

*International Organization:*

- World Health Organization, Eastern Mediterranean Regional Office (EMRO)

*Saudi Non-Ministry of Health Organization:*

- General Authority for Statistics

*Saudi Ministry of Health:*

- E-Health Deputyship (Data administration and Artificial intelligence & SHAHM enterprise)
- Therapeutic services deputyships (Organizational Excellency & Medical Record Administration and Health Information management)
- Regional (governorate) directorate of health affairs (20)
- Public Health Deputyship (Epidemiology Department and Child Health Program)
- General Directorate of Statistics and Information
- Health Volunteering Administration
- International Relation Department
- General management of call centers (937)
- International indicators committee
- Research and study department at MOH (IRB and publication)



**Figure 1: Stakeholders of the project**



## 7. Implementation

### 7.1. Sampling framework

The project adopts a cross-sectional design, based on phone-based interviews, on a target sample of  $n = 10,000$  children from the 20 governorates (Directorate of Health Affairs affiliated to MOH) in KSA. In fact, based on sample size calculations, a **minimum** sample of  $n=6403$  infants and children were needed, assuming a 50% prevalence per breastfeeding indicator, and taking into consideration 4 age groups (0-5.9M; 6-11.9 M; 12-17.9 M; 18-23.9 M), with a 3% error, 95% confidence level and a 1.5 design effect.

Table 2 presents the sample size per district based on the target sample of  $n=10,000$ . A stratified random sampling was adopted, with the strata being the various governorates in KSA. The sampling in the various governorates was based on a probability proportional to size approach, i.e. the number of children to be recruited in the study from each governorate was proportional to the total number of births recorded in the governorate as compared to the total births in the country in 2022.

Based on the birth records, a computerized list was compiled for each governorate. Electronic randomization was then performed to select the sample per district. Oversampling by approximately 30% was implemented in order to account for refusal/non-response rate.

In addition, the sample distribution by age group (0-5.9 months; 6-11.9 months; 12-17.9 months; 18-23.9 months) was aligned with the distribution extracted from the birth records. This was implemented by pulling the governorates' data for all four age groups, filtering the data for each age group separately and generating a random computerized list. The proportion of each age group was based on the 2022 data for the total population and age groups. The proportions for the 4 age groups were therefore determined at 22.3% for 0-5.9 months, 26.1% for 6-11.9 months, 24.4% for 12-17.9 months and 27.2% for 18-23.9 months.

#### ***Inclusion criteria:***

- Infants and young children born in the past 2 years (i.e. born between 20 May 2023 and 20 May 2021 1st phase and (7 November -1 November 2<sup>nd</sup> phase)
- Born in KSA in any hospital (public or private)
- Currently alive or deceased
- Any nationality

#### ***Exclusion criteria:***

- Absence of phone number in the birth record
- Mother and child are currently not living in KSA (and do not have a local phone number)
- Child's age above 23.99 months



**Table 2: Sample size per region or governorate for the national assessment of breastfeeding indicators, 2023**

Region	Governorate	Actual number of newborns in 2022	Estimated sample per governorate for the 2023 national assessment
		(n, %)	
Central	Riyadh	132412 (25.22)	2522 (25.22)
	Qassim	25284 (4.78)	482 (4.82)
	Hail	12859 (2.45)	245 (2.45)
Northern	Northern borders	8380 (1.60)	160 (1.60)
	Al-Jouf	9550 (1.82)	182 (1.82)
	AlGurayat	5704 (1.09)	109 (1.09)
	Tabuk	16664 (3.17)	317 (3.17)
Eastern	Eastern	45268 (8.63)	863 (8.62)
	Alahsa	20276 (3.87)	386 (3.86)
	Hafer Albatin	10641 (2.03)	203 (2.03)
Western	Mekkah	30992 (5.91)	590(5.90)
	Medina	39733 (7.58)	757 (7.57)
	Jeddah	57991 (11.06)	1104 (11.05)
	Taif	20225 (3.85)	385 (3.85)
	Al-Qunfudhah	3932 (0.75)	75 (0.75)
Southern	Al-Baha	6160 (1.17)	117 (1.17)
	Aseer	33311 (6.35)	635 (6.35)
	Bisha	5715 (1.09)	109 (1.09)
	Jazan	25241 (4.81)	481 (4.81)
	Najran	14597 (2.78)	278 (2.78)
Total		524935 (100)	10000 (100)

## 7.2. Respondents

In this project, the interviewing method is based on telephone calls. The respondents are mainly the mothers but may also include other caregivers when needed/applicable.





The questions related to feeding in the first few days immediately after birth (ever breastfed; early initiation of breastfeeding; and exclusively breastfed for the first two days after birth), are asked to the mothers (unless this was not possible because of death, separation etc.).

For the current status indicators, the respondent should be the mother and/or any person who knows most about the current care and feeding of the infant/ child. For this purpose, and in case multiple caregivers have fed the child at different times during the previous day (e.g. a mother and grandmother, or a mother and sister; or mother and babysitter etc.), the mother is encouraged, during the interview, to consult with the other caregivers to provide all the needed information pertinent to the child's feeding. Specific attention should be given to the child's feeding at daycare, if applicable (the mother can obtain this information from the daycare center).

If no respondent is present who knows what the infant/young child was fed during the previous day, several strategies may be followed. The best option is to arrange for a call-back when the mother (and/or somebody who knows what the child was fed is available). If after several trials (usually 3 trials), the same situation occurs, then the participant should be replaced by another one on the list.

### **7.3. Questionnaire development**

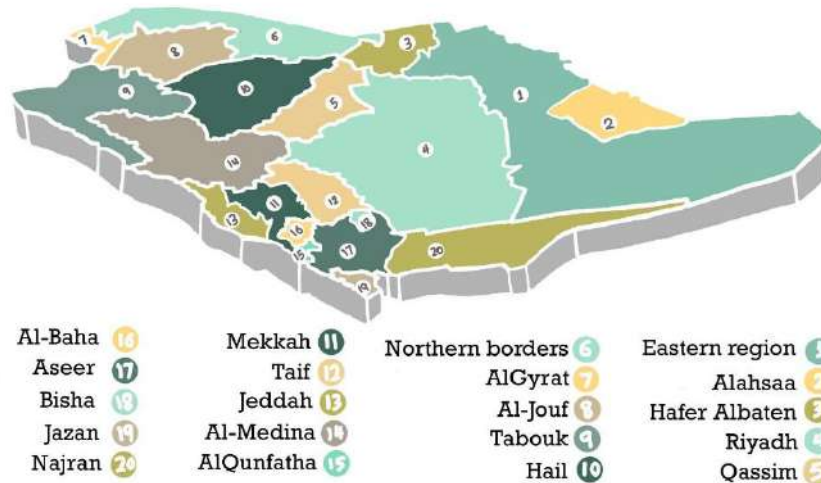
A multi-component questionnaire was developed for the project. It includes sections related to informed consent; maternal characteristics (age; social status; work status; education level); child's demographic characteristics (child's age; gender; nationality; order in the family); birth outcomes (mode of child delivery; gestational age;); child nutrition; and administrative data (governorate name; name of the interviewer; date of the interview; language in which the interview was conducted; and presence of interpreter).

The questions related to child nutrition were based on the updated 2021 WHO guidance document [13]. Except for the indicators 'ever breastfed,' 'early initiation of breast-feeding' and 'exclusively breastfed for the first two days after birth,' the evaluation of the three other indicators was based on current status data, that is information pertinent to the day preceding the interview. For this purpose, the mother (and/or other caregiver) is asked whether the child was breastfed yesterday during the day or at night, and then a series of questions are asked inquiring whether the infant/young child received any additional beverages or food. The list of beverages included in the questionnaire is based on the WHO 2021 questionnaire, while being tailored to the local culture such as adding examples of common brands of infant formula or yogurt drinks consumed in KSA. The questionnaire is shown **in Appendix 5 (Arabic version) and Appendix 6 (English version)**.

### **7.4. Field Coordinators and Interviewers**

The project team consisted of the headquarters team at the Ministry of Health and the fieldwork team.





**Figure 2: Geographical map of 20 health directorates belongs to MOH**

The fieldwork teams consisted of:

- **Field coordinators (Directorate of Health Affairs Coordinators):** One coordinator was appointed per governorate. All coordinators (n = 18 in phase 1, n = 9 in phase 2) were health care practitioners at the Ministry of Health. The duties of the Health Directorate Coordinators are presented **in Appendix 7** and summarized below:
  - Attend all project meetings
  - Draw the plan according to the feasibility (**Appendix 8**).
  - Attend all training sessions (and obtain a certificate of training completion as shown in **Appendix 9**)
  - Form the team of interviewers in the governorate
  - Coordinate with all project stakeholders, when needed
  - Maintain the confidentiality of the collected data
  - Make sure that space and phones are available for the data collectors.
  - Train data collectors (interviewers) on site after they join the unified package of online training.
  - Ensure that data collection is being conducted as per the standard protocol
  - Review a random set of questionnaires filled by each interviewer to check for completion
  - Monitor the number of interviews conducted by each interviewer
  - Submit feedback report (**Appendix 10**)

A document compiling the contact details of the coordinators in each of the governorates was prepared (template shown in **Appendix 11**).
- **Interviewers:** In total of more than 200 interviewers for the 2 phases were recruited for the data collection within the project. The interviewers were:
  - Health care workers at the Ministry of Health in Saudi Arabia or other sectors
  - Females
  - Having access to a personal email
  - Having acquired administrative approval from her direct supervisor to participate as an interviewer in the project



Multiple on-line training sessions have been carried out focusing on theoretical practical and technical areas for data collection and entry (SHAHM portal was used in phase 1 for data entry while in phase 2, an Excel sheet was used for data entry). The interviewers obtained a certificate of training completion as shown in **Appendix 9** prior to their involvement in data collection. All coordinators and interviewers had to sign a confidentiality undertaking before starting field work (**Appendix 12**).

## 7.5. Data collection

Data collection and occurred via *phone-based interviews* using the developed questionnaires. The interviews were conducted with the mothers (and other caregivers when needed/applicable). Each questionnaire necessitated 5-7 minutes for interview completion.

In phase 1 (i.e. the second project quarter), data was initiated on 24 May, 2023, and completed on 31<sup>st</sup> July 31, 2023 for infants and children born between 20 May 2023 and 20 May 2021. Data entry was conducted via the MOH self-service platform using *SHAHM* application (**Appendix 13**).

In phase 2 (i.e. the fourth project quarter), data collection was initiated on October 10 and completed on December 21, 2023 for infants and children born between 12 May 2023 and 1 November 2021 (batch 1); and 6 November 2023 and 1 June 2023 (batch 2). Given the various challenges identified with SHAHM portal during phase 1, data entry in phase 2 was performed on a pre-developed Excel sheet (**Appendix 14**). Table 3 explained the differences in data collections phases.



**Table 3: Data collection in both project's phases**

Data collection	1 <sup>st</sup> phase	2 <sup>nd</sup> phase
Number of field coordinators	18 (+ 2 at medical city)	9 (+4 at medical city)
Number of randomizations with list of selected children	1	2 batches
List for interviews	Majority with fathers' phone numbers	Almost all mothers' phone numbers were made available for interviewers
Trainees in the online course	72	131
Sample	3059 + (384*)	5799
Data entry method	SHAHM electronic portal	Excel sheets send to kanz e-mail (Kanzbf2023@gmail.com)

\* In phase 1, we were not able to extract/retrieve 384 questionnaires (due to a technical glitch with SHAHM). The data stemming from these questionnaires could not be analyzed in phase 1 but were retrieved later and included in the final analysis as mentioned in this report



## 7.6. Quality Control Measures and Training

Training sessions were organized to train the field coordinators and interviewers on conducting the phone interviews, acquiring the needed skills and collecting the data in a standardized manner. A team of experts and a specialized team from the MOH and WHO conducted the training sessions. During the training, all aspects of the project were explained, including objectives, methodology of data collection, measurements of indicators, quality control, data entry, ethical considerations, and confidentiality.

The training sessions were conducted in May 2023 and October 2023 and included several modules including:

- Updates on key indicators for assessing infant and young child feeding practices
- Introduction to the training
- What are the specific indicators that will be collected during the project
- How to conduct telephone interviews
- Specific questions that will be asked in the interview: overview of the questionnaire
- Practice session on the questionnaire administration
- Discussion of challenges
- SHAHM application for data entry (phase 1)
- Data entry on Excel (phase 2)
- Lessons learnt from phase 1
- Quality control measures

The training sessions are all compiled in a training manual (**Appendix 15**) and information posters were disseminated (**Appendix 16**). The posters can be used to be send to phone number as message prior calling to the respondents. It was used in the first phase only.

A mechanism for data collection was developed and shared with the local authorities (**Appendix 17**). Process indicators for data collection were also set, as shown in Tables 4 and 5.

Weekly meetings were held between the project lead team and the Directorate of health affairs Coordinators from the various governorates. During these meetings, difficulties and challenges encountered during data collection were discussed, and remedial measures/solutions proposed. For example, the coordinators and interviewers were instructed to clarify to the respondents that the questionnaire is simple and quick and causes minimum inconvenience. The coordinators and interviewers were also instructed to reassure all respondents that their data will remain anonymous and will not be linked to any of their personal information. In the possibility that the respondent's participation was impeded by time constraints, interviewers were instructed to re-schedule appointments at the participant's convenience. Continuous training was also provided to the coordinators to reinforce the standardization of data collection across sites.

The collected data was also periodically assessed to evaluate the data collection and entry process. Interviews with fathers were noted to be more than the expected. The coordinators were notified and were advised to repeat these interviews if possible. This issue was reduced markedly afterwards. It was limited to special needs only. Fathers were willing to share their



wives' numbers after understanding the objectives of the interview and its content, although some remained cautious.

### 7.7. Data cleaning

The data was periodically assessed and data cleaning was performed, as summarized below:

- Data cleaning revealed errors in the entry of the date of birth of some infants/young children, and hence corrections were introduced by tracking the serial numbers.
- There were mistakes in the serial numbers in some cases. These were corrected later by unifying the use of English Capital letters for consistency purposes
- There were discrepancies in some cases between the serial numbers, the governorate codes, and the interviewers' names. These were revisited and corrected by the respective field coordinators.
- There were questionnaires entered in duplicates, it was related to technical issue in SHAHM application, and these were cleaned (any duplicate was eliminated). In phase 2, data entry was shifted to Excel, and the issue of duplicates was less pronounced. The data cleaning process eliminated any duplicates within Excel sheet.
- There were some mistakes in the date of interviews. These were also cleaned, in collaboration with the field coordinators and interviewers directly.

There were also several observations related to the way data were extracted from SHAHM:

- In phase 1, of the total 6220 questionnaires entered on SHAHM, we were not able to extract/retrieve 384 questionnaires (due to a technical glitch). The data stemming from these questionnaires could not be analyzed in phase 1 but were retrieved later and included in the final analysis as mentioned in this report .
- Upon extraction from SHAHM, the order and sequence of the questions/variables was different compared to the questionnaire (phase 1).
- Data was extracted in a mix of Arabic and English language, which posed difficulty in merging the data (phase 1) Two questions were not featured on SHAHM (yogurt consumption and child's weight) and considered to be missed by the project team (phase 1). These were later included in phase 2 of the project. Therefore, when the indicator for EBF was calculated for the total sample (phase 1 and phase 2), the data pertinent to yogurt drink consumption was considered as missing for children whose data was collected in phase 1 (and who were not available about their consumption of yogurt drink in the previous day).
- Some interviews were conducted with caregivers other than the mother (mainly the grand-mother), but there was no option to enter any description pertinent to the caregiver on SHAHM (phase 1). This was addressed in phase 2.

Other issues that were observed during the data cleaning process:

- Name of the interviewers were not always entered on SHAHM (either because of lack of access to the platform or because of personal preference not to report their names). Hence statistics for number of questionnaires completed per interviewer were not



available for all (phase 1). This issue was addressed in phase 2 since data entry shifted to Excel.

- In some instances, the individuals who performed the data entry were different from those who conducted the interview (due to lack of access to SHAHM amongst some, or due to site-specific task distribution) (phase 1). This issue was addressed in phase 2 since data entry shifted to Excel.
- A number of questionnaires were answered by fathers and these were excluded from the dataset and analysis.
- Data cleaning the second phase was mainly on cleaning the excels, merging them and dates checks.
- Preparing the first data on the same excel template of second phase in order to be analyzed as total.
- Delay of date of interviews was obvious in some regions hinder the age distribution.

## 7.8. Process indicators

The project's process indicators for the project are listed in Tables 4 and 5 below, for phases 1 and 2, respectively.

**Table 4: Process indicators for the national assessment of breastfeeding indicators in KSA (phase 1)**

Directorate	Appointment of the field Coordinator	Attending the Project Protocol Meeting	Attending the Training on Conducting Interviews	Delivering the Executive Plan Specific to the Directorate	Completing Phone Interviews and Data Entry on SHAHM
Al-Jouf	✓	✓	✓	✓	✓
Alahsa	✓	✓	✓	✓	✓
Al-Baha	✓	✓	✓	✓	✓
Aseer	✓	✓	✓	✓	✓
Bisha	✓	✓	✓	✓	✓
Eastern	✓	✓	✓	✓	✓
Hafar Al-Batin	✓	✓	✓	✓	✓
Hail	✓	✓	✓	✓	✓
Jazan	✓	✓	✓	✓	✓
Jeddah	✓	✓	✓	✓	✓
Makkah AlMukarmah	✓	✓	✓	✓	✓
Medina AlMunawara	✓	✓	✓	✓	✓
Najran	✓	✓	✓	✓	✓
Northern Borders	✓	✓	✓	✓	✓
Qassim	✓	✓	✓	✓	✓
AlGurayat	✓	✓	✓	✓	✓
Riyadh	✓	✓	✓	✓	✓
Taif	✓	✓	✓	✓	✓
Digital City (Al-Qunfudhah & Tabuk)	✓	✓	✓	✓	✓



**Table 5: Process indicators for the national assessment of breastfeeding indicators in KSA (phase:2)**

Region	Coordinators meeting	Training		Date of sending Excel output				First day of start the Interviews
		Coordinator	Team	7 NOV	18 NOV	25 NOV	30 NOV	
Riyadh	✓	✓	-	-	-	-	✓	21-11-2023
Qassim	✓	✓	✓	✓	✓	✓	✓	30-10-2023
Tabuk	✓	✓	✓	✓	✓	✓	✓	16-10-2023
Northern borders	-	✓	✓	✓	✓	✓	✓	7-11-2023
Eastern	✓	✓	✓	✓	✓	✓	✓	22-10-2023
Makkah	✓	✓	✓	✓	✓	✓	✓	31-10-2023
Jeddah	✓	✓	✓	-	-	-	✓	4-11-2023
Aseer	✓	✓	✓	✓	✓	✓	✓	11-10-2023
Besha	-	✓	-	-	-	-	✓	14-11-2023
Digital City ( Hail- AlGuyrat - Al-Jouf - Hafar Al-Batin- Medina AlMunawara- Al- Qunfudhah- Al- Baha- Alahsa - Najran- Jazan- Riyadh- Jeddah)	✓	✓	✓	✓	✓	✓	✓	15-10-2023

### 7.9. Calculation of the breastfeeding indicators and statistical analyses

Breastfeeding practices were assessed using the 2021 WHO IYCF guidelines. The definition and calculation method for each of the breastfeeding indicators is included in Table 6. Data analysis was conducted using Stata. For quality control purposes, the dataset was also shared with the General Directorate of Statistics and Information and the analysis was repeated to re-estimate each of the indicators. A letter was received from the General Directorate of Statistics and Information confirming that the same results were obtained for three indicators (among 100 core indicators).

The characteristics of the survey population and breastfeeding practices, were described as frequency and proportions for all the categorical variables.



**Table 6: Calculation of the various breastfeeding indicators as per the WHO 2021 guidance document**

Indicator	Definition	Calculation
Ever breastfed	Proportion of children born in the last 24 months who were ever breastfed.	$\frac{\text{Age in days} < 730 \text{ AND } Q17 = \text{Yes}}{\text{Age in days} < 730} \times 100$
Early initiation of breastfeeding	Proportion of children born in the last 24 months who were put to the breast within one hour of birth.	$\frac{\text{Age in days} < 730 \text{ AND } (Q18 = \text{immediately OR} = \text{less than one hour})}{\text{Age in days} < 730} \times 100$
Exclusively breastfed for the first two days after birth	Proportion of children born in the last 24 months who were fed exclusively with breast milk for the first two days after birth.	$\frac{\text{Age in days} < 730 \text{ AND } Q19 = \text{No}}{\text{Age in days} < 730} \times 100$
Exclusive breastfeeding under 6 months	Proportion of infants 0-5 months of age who were fed exclusively with breast milk during the previous day.	$\frac{\text{Age in days} < 183 \text{ AND } Q20 = \text{Yes AND } Q21A-21K = \text{No}}{\text{Age in days} < 183} \times 100$
Mixed feeding under 6 months	Proportion of infants 0-5 months of age who were fed formula and/or animal milk in addition to breast milk during the previous day.	$\frac{\text{Age in days} < 183 \text{ AND } Q20 = \text{Yes AND } (Q21B \text{ OR } Q21C = \text{Yes})}{\text{Age in days} < 183} \times 100$
Continued breastfeeding 12-23 months	Proportion of children 12-23 months of age who were fed breast milk during the previous day.	$\frac{\text{Age in days} \geq 365 \text{ AND } \text{Age in days} < 730 \text{ AND } Q20 = \text{Yes}}{\text{Age in days} \geq 365 \text{ AND } \text{Age in days} < 730} \times 100$

### 7.10. Sample characteristics

In phase 1, the sample consisted of 3059 children aged 2 years or below. The refusal rate was estimated at 30.3%. Details related to phase 1 are provided in the *First and Second Quarters Project Report 2023*. In addition, there was a sample of n=384 questionnaires collected in phase 1 that could not be extracted from SHAHM due to technical difficulties. These were later extracted with power PI and incorporated in the overall analysis.

In phase 2, a total of 6550 were invited to participate in the study. Of those, 656 refused to participate. Hence the refusal rate in phase 2 (10%) was 3 times lower compared to phase 1. Data cleaning further resulted in the exclusion of 95 questionnaires (e.g. answered by fathers (n=87) or child aged above 24 M). Accordingly, the final sample in phase 2 consisted of n= 5799 children aged 2 years or below.

The total sample from both phases of the project is n=9242, as shown in Figure 3.





**Figure 3: Flow diagram illustrating the sampling and the selection of the total sample for analysis**

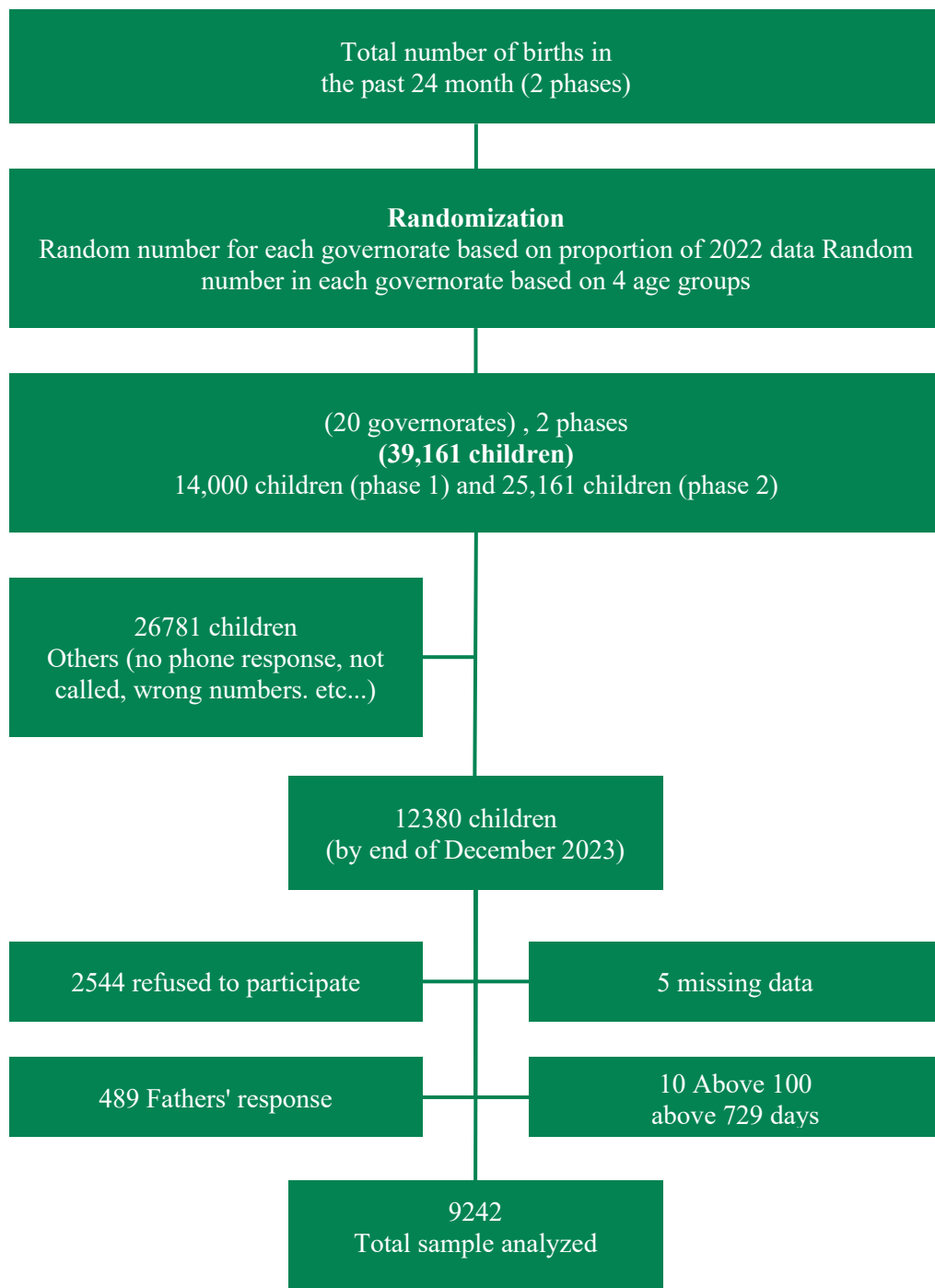


Table 7 shows the age distribution of the sample based on days categorization (in line with the WHO indicators) and in months.

**Table 7: Age distribution of the sample (n=9242), in days and months**

Child's age group (in days)	Sample distribution n (%)
0-182 days	4026 (43.6%)
183-364 days	1771 (19.16)
365-729 days	3445 (37.28)
Child's age group (in months)	Sample distribution n (%)
0-5.9 months	4026 (43.6%)
6-11.9 months	1771 (19.16%)
12-17.9 months	1788 (19.35%)
18-23.9 months	1657 (17.93%)

Table 8 shows the distribution of the sample from both phases as well as the total sample (n=9242) along the 20 governorates of KSA. The recruited sample represents 92.4% of the target sample of n=10,000. In comparison with the target sample shown in Table 2, The sample distribution across the sites shows that sampling was suboptimal in certain governorates, mainly Riyadh, Jeddah, Mekkah and Alahsa.

The demographic and socioeconomic characteristics of the sample are presented in Table 9. Majority of mothers were housewives (76.35%) and had more than 37-weeks-gestation (88.9%). The proportions of mothers who had high school level education (or less) and diploma/university level education were estimated at 36.8% and 55.04%, respectively. A minority were illiterate (3.83%) or had above university level education (4.32%). Approximately, two-third of the deliveries were reported as normal vaginal deliveries, while on-third were reported as Caesarian section deliveries.

The children's sample sex distribution was of 51.6% for boys and 48.4% for girls. Majority of the children in the sample had the Saudi nationality (88.9%). Of the study sample, 21.7% of children were the first born in their family.

The sample was considered representative for national population in terms of the size, involvement five main geographical regions, and involvement of the main three health sectors. The sample data about family income, urban vs rural areas, and living status of the children are missing in this population. When considering the child nationality, child birth for non-Saudi was found to be (23.5%) in 2022 and (26.9%) in 2023 and their distribution was variable in the 20 regions, where it was found to be higher in Riyadh, Jeddah, Mekkah and Eastern regions. KANZ breastfeeding data have only 11% of non-Saudi for unknown reason. The age in month distribution per directorate did not meet the target levels, so weighted analysis was considered.



**Table 8: Distribution of the sample along the various governorates of KSA in phase 1, phase 2 and the total sample (n=9242)**

Region		Phase 1 (July)	Phase 1 with Shahm Data extracted later*	Phase 2 (December)	Total
		n (%)	n (%)	n (%)	n (%)
Central	Riyadh	224 (7.32)	227 (6.59)	1192 (20.56)	1419 (15.35)
	Qassim	291 (9.51)	296 (8.60)	276 (4.76)	572 (6.19)
	Hail	77 (2.52)	78 (2.27)	139 (2.40)	217 (2.35)
Northern	Northern Borders	46 (1.50)	68 (1.98)	68 (1.17)	136 (1.47)
	Al-Jouf	116 (3.79)	149 (4.33)	162 (2.79)	311 (3.37)
	AlGurayat	27 (0.88)	27 (0.78)	21 (0.36)	48 (0.52)
	Tabouk	55 (1.80)	55 (1.60)	536 (9.24)	591 (6.39)
Eastern	Eastern	454 (14.84)	575 (16.70)	873 (15.05)	1448 (15.67)
	Al-Ahsa	62 (2.03)	62 (1.80)	86 (1.48)	148 (1.60)
	Hafer Al-Batin	121 (3.96)	154 (4.47)	119 (2.05)	273 (2.95)
Western	Mekkah	8 (0.26)	9 (0.26)	410 (7.07)	419 (4.53)
	Medina	119 (3.89)	120 (3.49)	412 (7.10)	532 (5.76)
	Jeddah	279 (9.12)	295 (8.57)	481 (8.29)	776 (8.40)
	Taif	218 (7.13)	247 (7.17)	307 (5.29)	554 (5.99)
	Al-Qunfatha	33 (1.08)	42 (1.22)	23 (0.40)	65 (0.70)
Southern	Al-Baha	70 (2.29)	92 (2.67)	96 (1.66)	188 (2.03)
	Aseer	338 (11.05)	393 (11.41)	232 (4.00)	625 (6.76)
	Jazan	209 (6.83)	210 (6.10)	161 (2.78)	371 (4.01)
	Bisha	69 (2.26)	69 (2.00)	151 (2.60)	220 (2.38)
	Najran	243 (7.94)	275 (7.99)	54 (0.93)	329 (3.56)
Total		3059 (100)	3443 (100)	5799 (99.98)	9242 (99.98)

\* There was a sample of n=384 questionnaires that could not be extracted from SHAHM due to technical difficulties. These were later extracted and incorporated in the overall analysis.



**Table 9: Demographic and socioeconomic characteristics of the sample**

Sample characteristics	Phase 1 (July) n (%)	Phase 1 with Shahm Data extracted later n (%)*	Phase 2 (December) n (%)	Total n (%)
<i>Sector</i>				
Other Government	614 (20.07)	722 (20.97)	118 (19.29)	1840 (19.92)
Ministry of Health	1615 (52.80)	1792 (52.05)	2912 (50.24)	4704 (50.91)
Private sector	830 (27.13)	929 (26.89)	1766 (30.47)	2695 (29.17)
<i>Mother's social status</i>				
Divorced/widow	17 (0.55)	21 (0.61)	39 (0.67)	60 (0.65)
Married	3042 (99.44)	3422 (99.39)	5757 (99.33)	9179 (99.35)
<i>Mother's work status</i>				
Housewife	2498 (81.66)	2805 (81.47)	4244 (73.31)	7049 (76.35)
Student	94 (3.07)	115 (3.34)	147 (2.54)	262 (2.84)
Working woman	467 (15.27)	523 (15.19)	1398 (24.15)	1921 (20.81)
<i>Mother's education</i>				
Illiterate (cannot read or write)	148 (4.84)	161 (4.68)	193 (3.33)	354 (3.83)
High school or less	1299 (42.46)	1469 (42.67)	1931 (33.32)	3400 (36.80)
Diploma and university	1496 (48.90)	1689 (49.06)	3396 (58.60)	5085 (55.04)
Above university	116 (3.79)	124 (3.60)	275 (4.75)	399 (4.32)
<i>Type of birth</i>				
Caesarean section	1060 (34.65)	1201 (34.88)	2231 (38.48)	3432 (37.14)
Normal Vaginal Delivery	1999 (65.35)	2242 (65.12)	3567 (61.52)	5809 (62.86)
<i>Gestational age at birth</i>				
Less than 37 weeks	288 (9.41)	517 (15.02)	500 (8.63)	1017 (11.01)
More than 37 weeks	2771 (90.59)	2926 (84.89)	5293 (91.37)	8219 (88.99)
<i>Child's sex</i>				
Boy	1597 (52.21)	1800 (52.28)	2967 (51.2)	4767 (51.60)
Girl	1462 (47.79)	1643 (47.72)	2828 (48.8)	4471 (48.40)
<i>Child's nationality</i>				
Saudi	2716 (88.79)	3054 (88.73)	5154 (89.02)	8208 (88.91)
Non-Saudi	343 (11.21)	388 (11.28)	636 (11.02)	1024 (11.02)
<i>Child's order in the family</i>				
The First	690 (22.56)	771 (22.39)	1197 (21.25)	1968 (21.69)
Other	2369 (77.44)	2672 (77.61)	4435 (78.75)	7107 (78.31)

\*There was a sample of n=384 questionnaires that could not be extracted from SHAHM due to technical difficulties. These were later extracted and incorporated in the overall analysis.



## 8. Outcomes (KPI breastfeeding)

The breastfeeding indicators were calculated as per the WHO guidelines (2021). The results are summarized in Table 10-A and described below by phase in Table 10-B, and for the total population. In addition, analyses were weighted by sample weights using ‘svy’ commands to account for the stratified sampling design and were conducted using Stata.

Additional sensitivity analyses were performed to address the oversampling of infants aged 0-182 days. Accordingly, a random subsample of 0-182 days was taken from the total sample (leading to the inclusion of n=1624 infants aged 0-182 days out of the 4026 infants available in the sample; and a total sample of n=6840 instead of n=9242). Accordingly, the prevalence estimates obtained were very similar to the ones determined on the overall sample (the prevalence estimates were as follows: EvBF: 89.8%; EIBF: 43.2%; EBF2D: 30.6%; EBF: 14.2%; Mixed milk feeding: 35.6% and CBF: 20.4%.

The analysis on this subsample was also repeated with sample weights. The prevalence estimates for the various indicators were similar for all indicators but was slightly higher for EBF (EvBF: 88.9%; EIBF: 43.3%; EBF2D: 31.7%; EBF: 17.9%; Mixed milk feeding: 32.86% and CBF: 19.6%). Additional analysis was conducted amongst infants aged 0–5 months specifically, given that mothers’ recall of breastfeeding practices may be more precise in this age group. The results were very similar to those obtained for the total sample (EvBF, EIBF, and EBF2D were estimated at 90.5%, 43.7%, and 31.3%, respectively).

The data is further presented for the five main regions of KSA, in Tables 11 and Figures 4 and 5, for the total population,

The Eastern Region had the highest prevalence of early initiation of breastfeeding, while both Eastern and Western Regions had the highest rates of exclusive breastfeeding for the first 6 months and continued breastfeeding at 12-23 months. The highest rates of exclusive breastfeeding during the first 2 days were observed in the Northern Region, and the highest prevalence of mixed milk feeding was observed in the Southern Region of the KSA.

**Table 10-A: Proportions of children meeting each of the six breastfeeding indicators of the total sample (based on weighted analyses\*)**

Indicator	Total, weighted*
Ever breastfed (EvBF) <sup>a</sup>	89.3%
Early initiation of breastfeeding (EIBF) <sup>b</sup>	43.4%
Exclusively breastfed for the first two days after birth (EBF2D) <sup>c</sup>	31.3%
Exclusive breastfeeding under six months (EBF) <sup>d</sup>	15.5%
Mixed milk feeding under six months (MixMF) <sup>e</sup>	34.9%
Continued breastfeeding 12-23 months (CBF) <sup>f</sup>	19.6%



**Table 10-B: Proportions of children meeting each of the six breastfeeding indicators of the WHO in quarter 2, quarter 4 and the total sample (based on unweighted and weighted analyses\*)**

Indicator	1 <sup>st</sup> Quarter	2 <sup>nd</sup> Quarter	3 <sup>rd</sup> Quarter	4 <sup>th</sup> Quarter	Total	Total, weighted*
Ever breastfed (EvBF) <sup>a</sup>	-	86.2%	-	92.2%	89.9%	<b>89.3%</b>
Early initiation of breastfeeding (EIBF) <sup>b</sup>	-	43.0%	-	44.3%	44.1%	<b>43.4%</b>
Exclusively breastfed for the first two days after birth (EBF2D) <sup>c</sup>	-	31.7%	-	30.2%	30.3%	<b>31.3%</b>
Exclusive breastfeeding under six months (EBF) <sup>d</sup>	-	9.4%	-	15.6%	14.4%	<b>15.5%</b>
Mixed milk feeding under six months (MixMF) <sup>e</sup>	-	39.5%	-	35.9%	36.6%	<b>34.9%</b>
Continued breastfeeding 12-23 months (CBF) <sup>f</sup>	-	24.3%	-	16.9%	20.4%	<b>19.6%</b>

<sup>a</sup> Ever breastfed: percentage of children born in the last 24 months who were ever breastfed

<sup>b</sup> Early initiation of breastfeeding: percentage of children born in the last 24 months who were put to the breast within one hour of birth

<sup>c</sup> Exclusively breastfed for the first two days after birth: percentage of children born in the last 24 months who were fed exclusively with breast milk for the first two days after birth

<sup>d</sup> Exclusive breastfeeding under 6 months: percentage of infants 0-5 months of age who were fed exclusively with breast milk during the previous day

<sup>e</sup> Mixed milk feeding under six months: Percentage of infants 0-5 months of age who were fed formula and/or animal milk in addition to breast milk during the previous day

<sup>f</sup> Continued breastfeeding 12-23 months: Percentage of children 12–23 months of age who were fed breast milk during the previous day

# Total sample=9242 children aged below 2 years in KSA

\* Analyses were weighted to account for the stratified sampling design

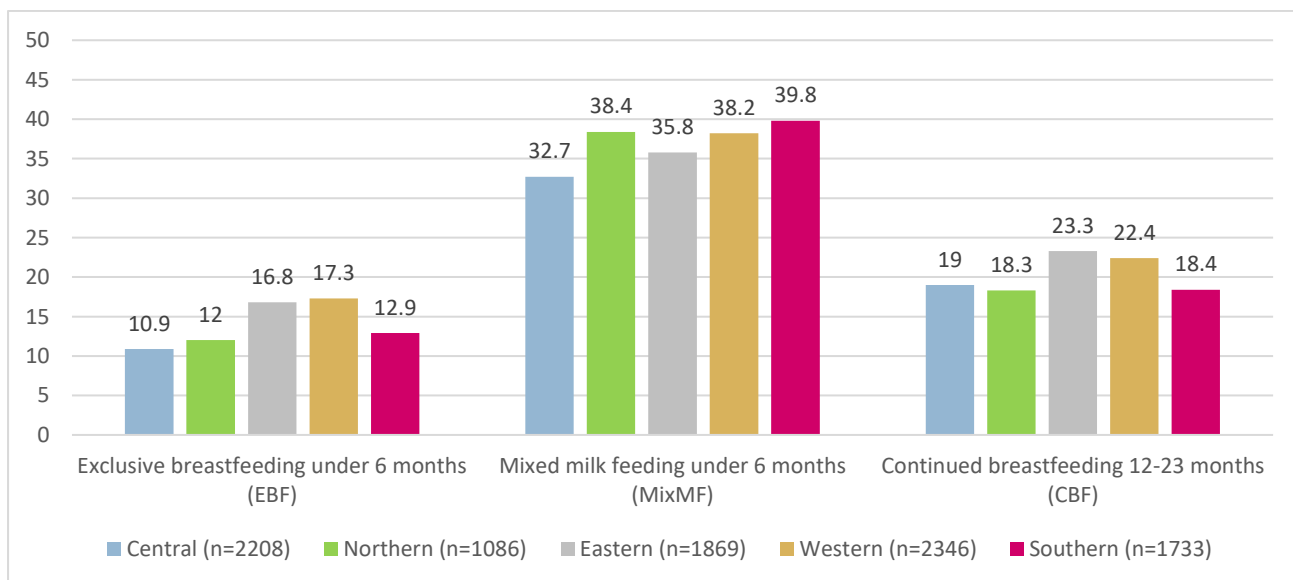
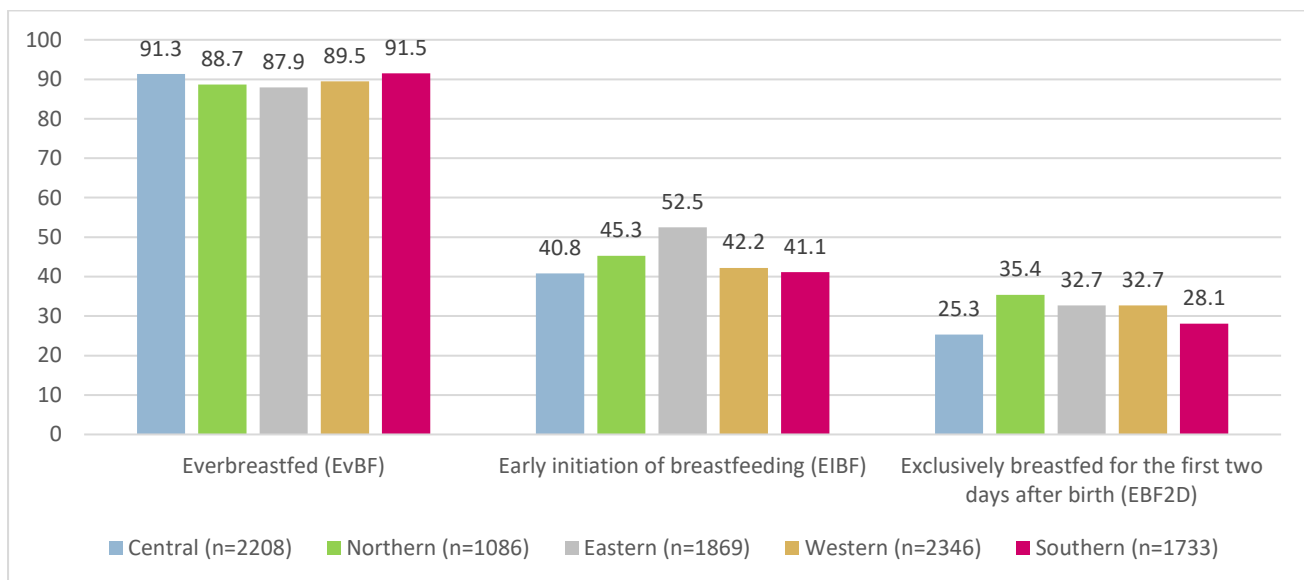
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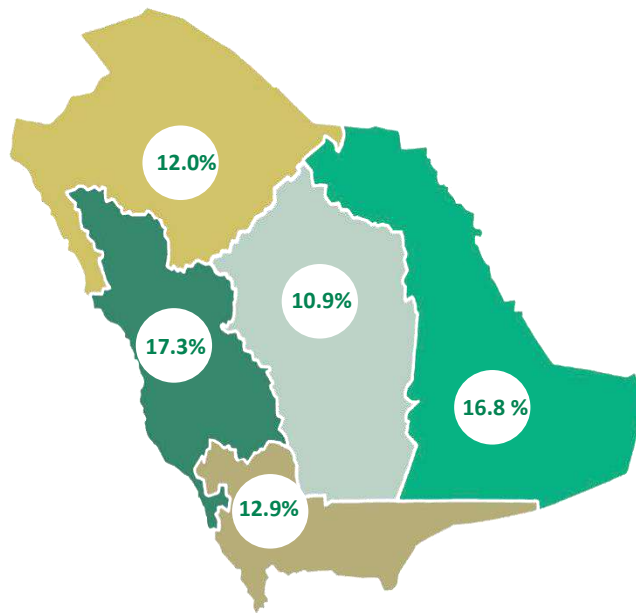
**Table 11: Proportions of children meeting each of the six breastfeeding indicators of the WHO by region, based on unweighted analyses**

Indicator	Proportions				
	Central (n=2208)	Northern (n=1086)	Eastern (n=1869)	Western (n=2346)	Southern (n=1733)
Ever breastfed	91.3%	88.7%	87.9%	89.5%	91.5%
Early initiation of breastfeeding	40.8%	45.3%	52.5%	42.2%	41.1%
Exclusively breastfed for the first two days after birth	25.3%	35.4%	32.7%	32.7%	28.1%
Exclusive breastfeeding under 6 months	10.9%	12.0%	16.8%	17.3%	12.9%
Mixed milk feeding under 6 months	32.7%	38.4%	35.8%	38.2%	39.8%
Continued breastfeeding 12-23 months	19.0%	18.3%	23.3%	22.4%	18.4%



**Figure 4: Prevalence of ever breastfeeding, early initiation of breastfeeding and exclusive breastfeeding for the first 2 days, exclusive breastfeeding (under 6 months), mixed milk feeding under 6 months and continued breastfeeding (12-23 months) in the various regions of KSA**





**Figure 5: Map of Exclusive breastfeeding under 6 months at KSA by region, 2023**

Table 12 and Figure 6 show infant feeding patterns amongst those aged less than 6 months, by age group (expressed in months), in comparison with the WHO ideal feeding patterns. The prevalence of exclusive breastfeeding, as well as the proportions of infants receiving breast milk in addition to other types of milk or solids were found to decrease with age, while the proportions of non-breastfed infants tended to increase. In the 0-5.9-month-old age group, the proportion of those receiving breastmilk + plain water was estimated at 2.6%.

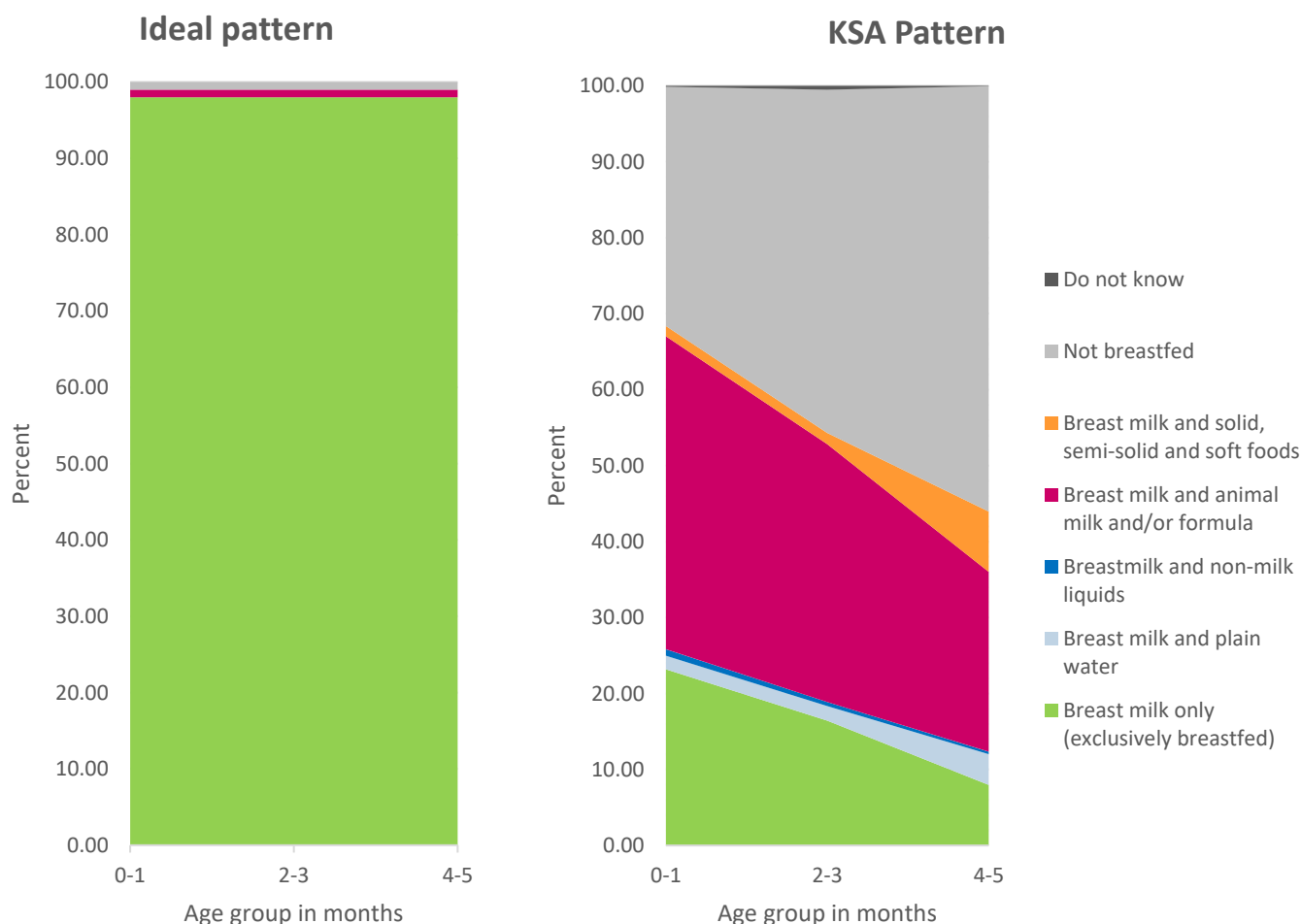




**Table 12: Area graph patterns of infant feeding practices by age group for under 6 months children (n=4026)**

n	Month	Do not know	Not breastfed	Breast milk and solid, semi-solid and soft foods	Breast milk and animal milk and/or formula	Breastmilk and non-milk liquids	Breast milk and plain water	Breast milk only (exclusively breastfed)	
1064	KSA	0-1	0.13	31.49	1.35	41.20	0.84	1.80	23.19
1585		2-3	0.51	45.18	1.46	33.93	0.56	1.91	16.43
1377		4-5	0.04	56.00	7.94	23.66	0.33	4.05	7.97
4026		0-5	0.26	45.03	3.55	32.53	0.56	2.58	15.49

**Figure 6: Area graph patterns of infant feeding practices by age group in infants under**



**6 months children: the pattern observed in KSA in comparison to the ideal pattern**



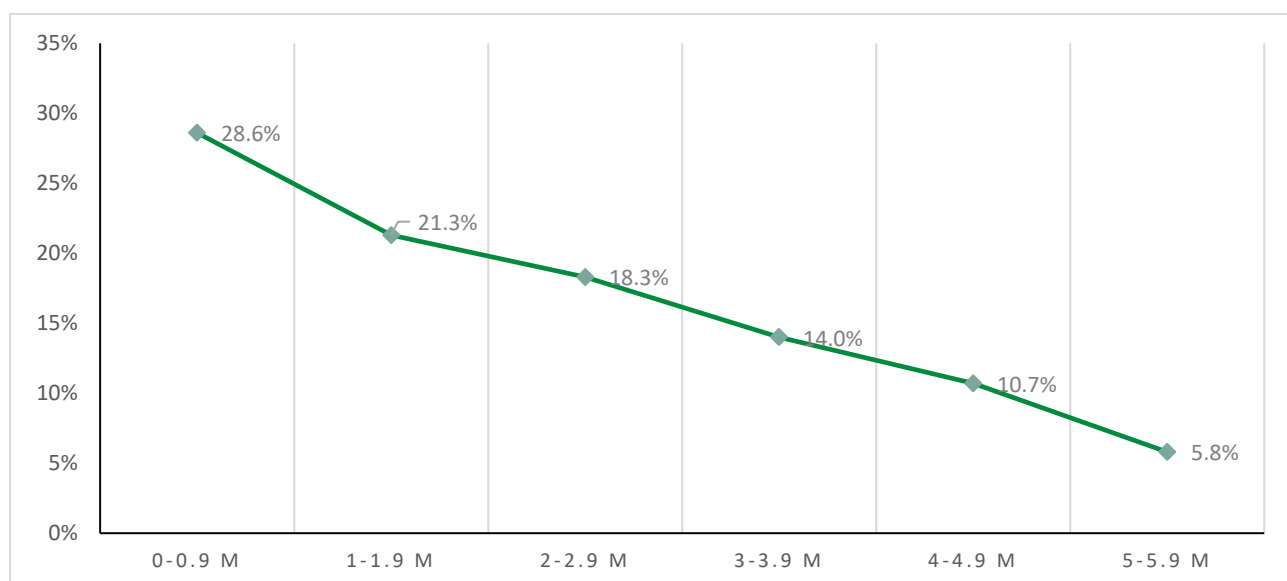
Table 13 and figure 7 show that the proportions of exclusively breastfed infants decreased consistently with age, whereby the weighted prevalence was estimated at 28.6% in infants aged less than one month, reaching as low as 5.8% in those aged 5-5.9 months.

**Table 13: Proportions of infants being exclusively breastfed by 1 month age intervals, in KSA**

Proportions (%) of infants receiving EBF				
Age group	Phase 1*	Phase 2	Total (unweighted)	Total (weighted)
0-0.9 m	7/38= 18.4%	74/276= 26.8%	81/314= 25.8%	<b>28.6%</b>
1-1.9 m	19/149= 12.7%	111/583= 19.0%	130/732= 17.8%	<b>21.3%</b>
2-2.9 m	28/152= 18.4%	102/560= 18.2%	130/712= 18.3%	<b>18.3%</b>
3-3.9 m	12/137= 8.8%	105/696= 15.1%	117/833= 14.1%	<b>14.0%</b>
4-4.9 m	11/187= 5.9%	62/567= 10.9%	73/754= 9.7%	<b>10.7%</b>
5-5.9 m	10/222= 4.5%	37/459= 8.1%	47/681= 6.9%	<b>5.8%</b>

\*Includes additional extracted data from SHAHM

**Figure 7: Proportions (%) of infants receiving EBF, by age group based on one month intervals**



## 9. Factors Associated with inadequate breastfeeding practices in KSA

Association of the sample's demographic and socioeconomic characteristics with breastfeeding practices were examined using simple and multiple logistic regression analyses, where each breastfeeding practice indicator was treated as a dependent variable, expressed as “yes” or “no”. Unadjusted Odds Ratio (OR) with 95% confidence intervals (CI) were calculated. Multiple logistic regression using backward stepwise selection, removing terms with  $p \geq 0.2$  and adding those with  $p < 0.1$ , was then conducted to compute the adjusted ORs. Weighted analyses were carried out by sample weights using ‘svy’ commands to account for the stratified sampling design and were conducted using Stata (StataCorp. 2019. Stata: Release 16. Statistical Software. StataCorp., LLC). A p-value less than 0.05 was considered statistically significant.

Results of the multiple logistic regression analyses are presented in Table 14 (while results of the simple regression analyses are shown in Appendix 18). There were higher odds of EIBF amongst girls compared to boys. Compared to non-Saudis, Saudi children had lower odds of EvBF, EBF2D, EBF, MixMF and CBF. In contrast, children who were not the first-born child in their respective families had higher odds for all investigated breastfeeding indicators.

Children whose mothers were students/employed had higher odds of EvBF, EIBF and MixMF as compared to housewives. Compared to mothers with diploma/university degree or higher, illiterate mothers had higher odds of EIBF and CBF, while those with a high-school degree or lower had higher odds of EIBF, EBF2D, and MixMF, and lower odds of EBF.

Compared to children born in MOH facilities, those born in other governmental facilities had lower odds of EvBF but higher odds of EIBF. Those born in private sector facilities had lower odds of EBF2D and MixMF. Premature children and those born via Cesarean-section delivery had lower odds of EvBF, EIBF, EBF2D, and EBF.

These results suggest that children of Saudi nationality had lower odds of meeting breastfeeding indicators. Several culture-specific factors may explain these observations, including Saudi women's perception of low milk supply, their lack of awareness about the safety of contraceptive methods during lactation as well as returning to work, all of which were previously described as the main reasons behind breastfeeding cessation amongst Saudi women [26]. Children who were not the first-borns in their families had higher odds of meeting all the breastfeeding indicators. These findings are in line with those reported from Lebanon [15], which showed that children with a higher birth order had higher odds of EvBF and EBF2D. This may be due to the fact that first-time mothers may have more difficulties in initiating and establishing breastfeeding and tend to be more anxious in comparison with mothers who had previous breastfeeding experiences [16].

In line with previous studies [27] children born via Cesarean-section were less likely to meet several breastfeeding indicators. Cesarean-section delivery, along with the related maternal and newborn complications, has been reported to impede skin-to-skin contact after birth and delay the initiation of breastfeeding, thereby affecting breastfeeding behavior and its duration [28]. In our study sample, 37.1% of delivery were via Caesarean-section, which is comparable to previous estimates from KSA [29]. It is therefore important to establish hospital-based



protocols to support mothers after Caesarian-section deliveries, such as increasing maternal awareness on the benefits of BF, allowing 24-h rooming-in, and/or bringing the infant for night feeds [27]. In our study, the observation that premature children had lower likelihood of BF (EBF, EIBF, EBF2D, EBF and CBF) is worrisome given that preterm infants who are given breast milk from own mother, wet nurse or donor milk (with milk kinship consideration ) instead of formula have lower risk of infections and necrotizing enterocolitis, and better neurological, cognitive, and visual development [30]. Health professionals and mothers can benefit from a better understanding of the factors that hinder mothers from transitioning their preterm infants to breastfeeding and their potential consequences. Finally, although lower education levels amongst mothers were not associated with lower odds of breastfeeding, maternal employment/student status was associated with higher odds of EvBF, EIBF, and MixMF. This suggest that, although it is commonly perceived that breastfeeding is less convenient than formula feeding for working mothers in KSA[9], employment/studying may not always be an impediment against breastfeeding.

These findings may guide the development of culturally-appropriate interventions aimed at promoting breastfeeding in KSA. These interventions may include: a wider implementation of the WHO ten steps to successful breastfeeding; multi-sectoral interventions targeting the identified risk factors for unsuccessful breastfeeding such as first-time mothers, mothers of preterm infants and those who had Caesarian-Section deliveries; further training of health care staff attending the delivery to support EIBF; addressing culture-specific barriers or misconceptions related to BF among Saudi women; promoting positive breastfeeding attitudes in the society; and evaluation of their effectiveness.



**Table 14: Determinants of the six WHO breastfeeding practice indicators using stepwise logistic regression analyses†**

Sample characteristics	EvBF (N=9242)	EIBF (N=9242)	EBF2D (N=9242)	EBF (N=4026)	MixMF (N=4026)	CBF (N=3445)
Adjusted OR (CI)						
<b>Child's sex</b>						
Boys	Reference	Reference				
Girls	1.11 (0.96, 1.27)	<b>1.16 (1.06, 1.27)***</b>				
<b>Child's nationality</b>						
Non-Saudi	Reference	Reference	Reference	Reference	Reference	Reference
Saudi	<b>0.67 (0.52, 0.87)**</b>	0.90 (0.78, 1.04)	<b>0.78 (0.67, 0.91)***</b>	<b>0.43 (0.33, 0.55)***</b>	<b>0.80 (0.65, 0.99)*</b>	<b>0.49 (0.38, 0.64)***</b>
<b>Child's order in the family</b>						
First-born child	Reference	Reference	Reference	Reference	Reference	Reference
Other	<b>1.52 (1.29, 1.80)***</b>	<b>1.13 (1.01, 1.27)*</b>	<b>1.25 (1.11, 1.40)***</b>	<b>1.40 (1.10, 1.78)**</b>	<b>1.20 (1.01, 1.43)*</b>	<b>1.29 (1.04, 1.61)*</b>
<b>Mother's age</b>						
Under 30 years	Reference	Reference			Reference	
30 years or older	0.88 (0.75, 1.03)	<b>0.90 (0.82, 0.99)*</b>			<b>1.19 (1.03, 1.37)*</b>	
<b>Mother's occupation status</b>						
Housewife	Reference	Reference	Reference		Reference	
Student/Working	<b>1.24 (1.05, 1.47)*</b>	<b>1.15 (1.03, 1.29)*</b>	1.12 (0.99, 1.25)		<b>1.20 (1.02, 1.40)*</b>	
<b>Mother's education</b>						
Diploma, university, or higher		Reference	Reference	Reference	Reference	Reference
High school or lower		<b>1.13 (1.03, 1.25)*</b>	<b>1.12 (1.01, 1.24)*</b>	<b>0.68 (0.55, 0.84)***</b>	<b>1.25 (1.07, 1.45)**</b>	
Illiterate (cannot read or write)		<b>1.33 (1.06, 1.68)*</b>	1.20 (0.95, 1.52)	1.50 (0.97, 2.32)	1.30 (0.91, 1.86)	<b>1.75 (1.20, 2.55)**</b>
<b>Sector related to place of delivery</b>						
Ministry of Health (MOH) facilities	Reference	Reference	Reference	Reference	Reference	Reference
Other governmental facilities	<b>0.72 (0.61, 0.84)***</b>	<b>1.38 (1.24, 1.55)***</b>		0.82 (0.63, 1.07)		
Private facilities			<b>0.81 (0.73, 0.90)***</b>	1.21 (0.98, 1.51)	<b>0.85 (0.73, 0.98)*</b>	<b>1.34 (1.10, 1.63)**</b>
<b>Type of delivery</b>						
Vaginal delivery	Reference	Reference	Reference	Reference		Reference
Caesarean section	<b>0.67 (0.58, 0.77)***</b>	<b>0.28 (0.26, 0.31)***</b>	<b>0.50 (0.45, 0.55)***</b>	<b>0.68 (0.55, 0.83)***</b>		<b>0.81 (0.67, 0.97)*</b>
<b>Gestational age at birth</b>						
Term	Reference	Reference	Reference	Reference	Reference	Reference
Premature	<b>0.52 (0.43, 0.62)***</b>	<b>0.57 (0.49, 0.67)***</b>	<b>0.56 (0.47, 0.66)***</b>	<b>0.61 (0.43, 0.87)</b>	<b>0.72 (0.58, 0.90)**</b>	0.78 (0.57, 1.06)

†Results are based on adjusted analyses; Empty cells indicate that the variables were not retained in the final model.

\*p <0.05, \*\*p <0.01, \*\*\*p<0.001

Abbreviations: CBF: Continued Breastfeeding; CI: confidence interval; EBF: Exclusive Breastfeeding Under Six Months; EBF2D: Exclusively Breastfed For The First 2 days After Birth; EIBF: Early Initiation of Breastfeeding; EvBF: Ever Breastfed; MixMF: Mixed Milk Feeding under six months; MOH: Ministry of Health; OR: odds ratio; WHO: World Health Organization.



The proportion of births per regions were estimated in the table 14 for 2023 where the higher non-Saudi births were at Riyadh, Mekkah, Jeddah, Eastern regions were the highest proportion in KSA, but Mekkah was the highest in terms of percentage of non-Saudi Birth within Mekkah regions. This can correlate with data for exclusive breastfeeding and mixed feeding below six months of age.

**Table 15: Distribution of births per nationality within the 20 regions for 2023**

Region	Saudi	Non-Saudi	Total	% of non-Saudi within total	% of non-Saudi within region
Qassim	21061	3360	24421	2.42%	13.75
Eastern	33198	11466	44664	<b>8.26%</b>	<b>25.6</b>
Riyadh	88840	45510	134350	<b>32.77%</b>	<b>33.8</b>
Tabouk	13988	2220	16208	1.60%	13.69
Mekkah	15612	18310	33922	<b>13.19%</b>	<b>53.93</b>
Al-Baha	4763	611	5374	0.44%	11.3
Al-Jouf	8659	1316	9975	0.95%	11.3
Northern Borders	6977	1209	8186	0.87%	14.76
Medina	29472	8764	38236	6.31%	22.9
Jazan	18215	5948	24163	4.28%	<b>24.61</b>
Hail	10800	1648	12448	1.19%	13.29
Aseer	26563	4933	31496	3.55%	15.66
Najran	10983	4154	15137	2.99%	27.44
Al-Ahsa	17018	2249	19267	1.62%	11.67
Al-Taif	16374	2728	19102	1.96%	14.28
AlGurayat	5479	637	6116	0.46%	10.41
Qunfatha	3181	498	3679	0.36%	13.53
Jeddah	37867	20461	58328	<b>14.74%</b>	<b>35.17</b>
Hafer Al-Batin	8059	2228	10287	1.60%	21.65
Bisha	4606	607	5213	0.44%	11.64
Total	381715	138857	520572	100%	-

The proportions of children meeting each of the breastfeeding indicators are shown in Table 15, by nationality. Compared to Saudi nationals, the proportions of children meeting the indicators were higher amongst other nationalities, for all the indicators. In particular, the proportions amongst Saudis were almost half compared to non-Saudis for EBF (12.8% and 25.8%, respectively) and CBF (18.8% and 34.6% respectively).



**Table 16. Proportions of children meeting the six WHO breastfeeding indicators by nationality**

Indicator	Nationality	
	Saudi children n=8208	Non-Saudi children n=1034
Ever breastfed	7348/8208= <b>89.5%</b>	960/1034= <b>92.8%</b>
Early initiation of breastfeeding	3627/8208= <b>44.2%</b>	449/1034= <b>43.4%</b>
Exclusively breastfed for the first two days after birth	2459/8208= <b>30.0%</b>	341/1034= <b>33.0%</b>
Exclusive breastfeeding under 6 months	457/3558= <b>12.8%</b>	121/468= <b>25.8%</b>
Mixed milk feeding under 6 months	1285/3558= <b>36.1%</b>	187/468= <b>40.0%</b>
Continued breastfeeding 12-23 months	582/3092= <b>18.8%</b>	122/353= <b>34.6%</b>

## 10. Comparison with other countries

The standardized WHO methodology applied in the estimation of the breastfeeding indicators allowed for comparison with data generated by other countries using the same approach. For this purpose, the UNICEF database on breastfeeding indicators was consulted, whereby the most recent indicator estimate per country was retained.

As shown in Table 15, the national estimates for the various breastfeeding indicators are lower than the average estimates at the global level (calculated based on the UNICEF database) and for the G20 countries (calculated based on the UNICEF database and additional data sources). The prevalence of early initiation of breastfeeding in KSA is similar to the average for MENA countries (calculated based on the UNICEF database), while the prevalence of exclusive breastfeeding for the first 2 days and under 6 months in KSA are lower than the region's average estimates. There was no data on mixed milk feeding indicator in the UNICEF database.



**Table 17: Comparison of the KSA estimates with global, G20 and MENA regional estimates**

Indicator	KSA	MENA*	G20 countries&	Global*	Global#
Ever breastfed (EvBF) <sup>a</sup>	<b>89.3%</b>	92.7%	92%	94.3%	--
Early initiation of breastfeeding (EIBF) <sup>b</sup>	<b>43.4%</b>	43.3%	56.1%	53%	47%
Exclusively breastfed for the first two days after birth (EBF2D) <sup>c</sup>	<b>31.3%</b>	45.2%	64.9%	68%	67%
Exclusive breastfeeding under six months (EBF) <sup>d</sup>	<b>15.5%</b>	27.7%	35.1%	41%	48%
Continued breastfeeding 12-23 months (CBF) <sup>f</sup>	<b>19.6%</b>	39.4%	41.8%	51.4%	--

\*Calculated based on the UNICEF database, while selecting the most recent estimate for each country featured in the database [18-20]

&Data was not available for all the G20 countries in the UNICEF database. Hence additional data sources were consulted.

# Published estimates [21]

Globally, the ranking for KSA was as follows:

- Ever breastfed: rank 122 out of 136 countries
- Early initiation of breastfeeding: rank 96 out of 136 countries
- Exclusive breastfeeding for the first 2 days after birth: rank 108 out of 112 countries
- Exclusive breastfeeding under 6 months: rank 127 out of 137 countries
- Continued breastfeeding: rank 123 out of 131 countries

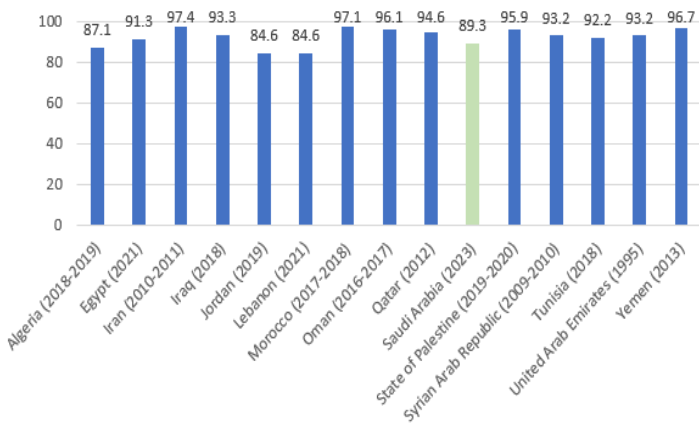
The comparison is further displayed by country in Figures 8 and 9 for the MENA and the G20 countries, respectively. The country-specific data were extracted from the UNICEF database [18-20], whereby the most recent available estimate was used per country.





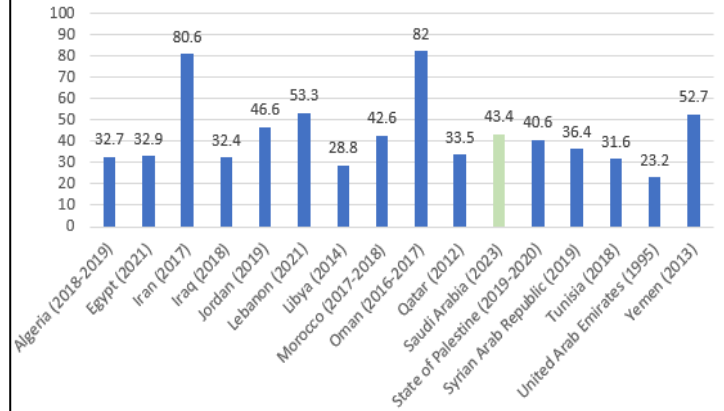
**Figures 8: Breastfeeding indicators (%) in KSA in comparison with other MENA countries based on UNICEF database**

**Ever breastfed – comparison with the MENA countries**



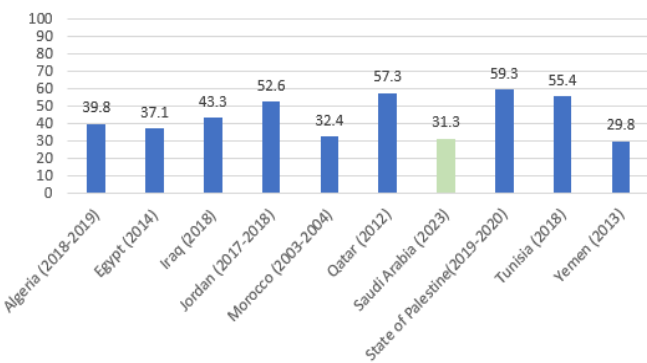
Data for the MENA countries were retrieved from the UNICEF database

**Early initiation of breastfeeding – comparison with MENA countries**



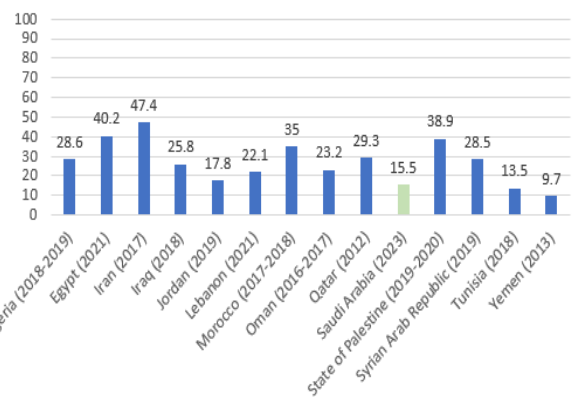
Data for the MENA countries were retrieved from the UNICEF database

**Exclusive breastfeeding for the first 2 days after birth – comparison with MENA countries**



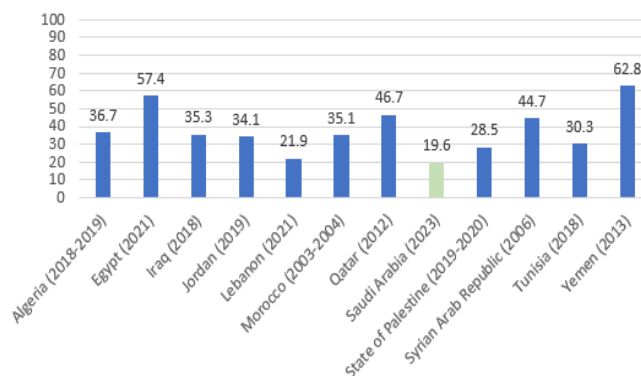
Data for the MENA countries were retrieved from the UNICEF database

**Exclusive breastfeeding (under 6 months) - comparison with MENA countries**



Data for the MENA countries were retrieved from the UNICEF database

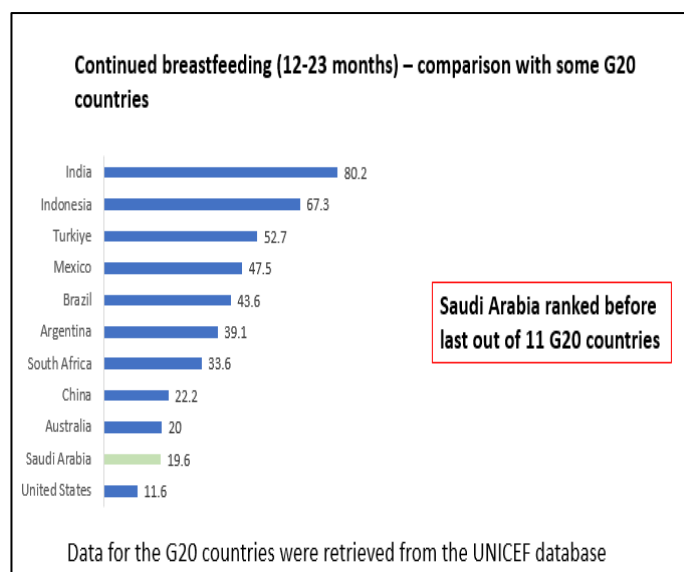
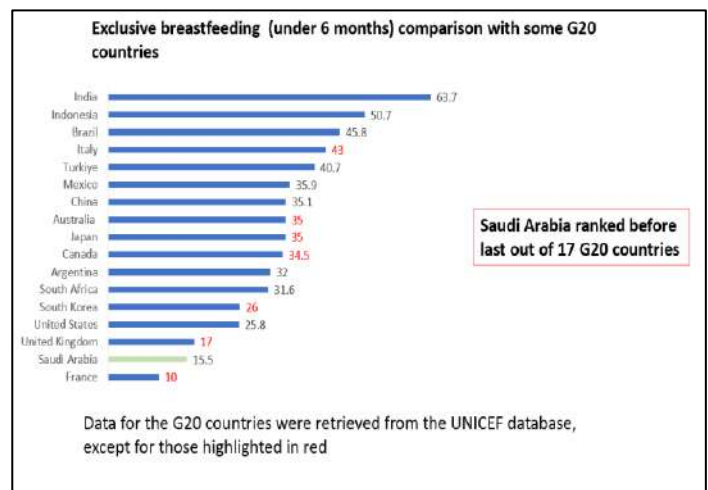
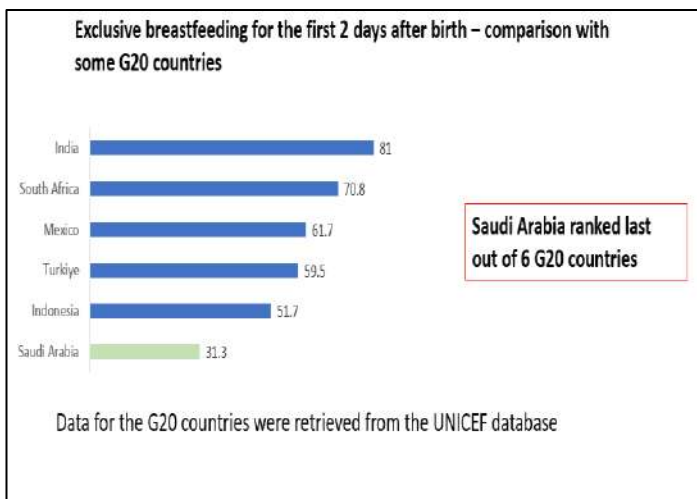
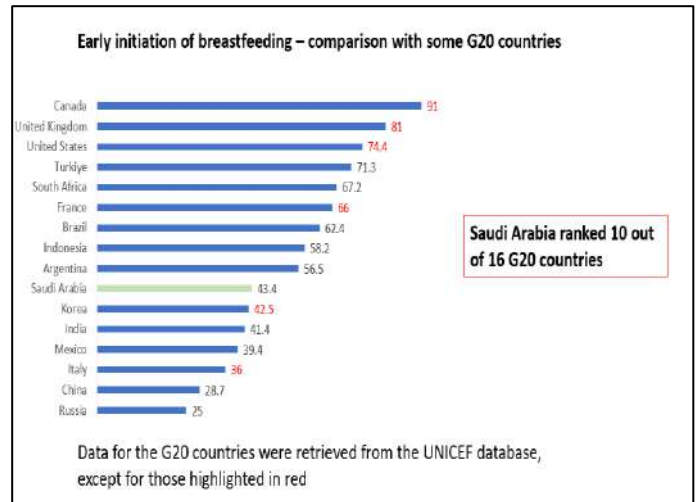
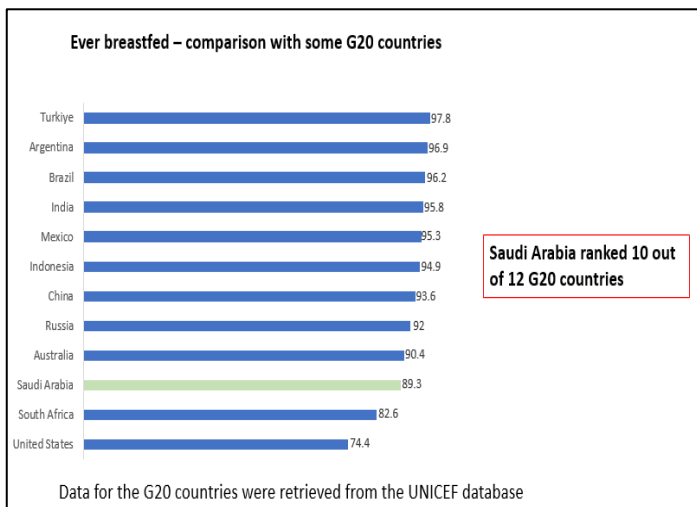
**Continued breastfeeding (12-23 months) – comparison with MENA countries**



Data for the MENA countries were retrieved from the UNICEF database



**Figures 9: Breastfeeding indicators (%) in KSA in comparison with other G20 countries based on the UNICEF database, and additional data sources for countries that were missing in the database (these are shown in red font)**



## 11. Comparison with previous studies in KSA:

A comparison was made with estimates reported in the scientific literature (year 1987 onwards). These are compiled in Table 16. A wide range of estimates can be noticed. It is important to caution that the definitions of the various indicators may vary between studies, which may limit the comparability of the generated estimates. For instance, the prevalence of exclusive breastfeeding under 6 months tends to be overestimated when using retrospective recall methods as compared to the WHO recommended approach focused on “current” feeding practices.

There are national breastfeeding practice data and reports from nutritional surveillance for many years till 2019, and general authority for statistics, they indicate the downwards trends in breastfeeding duration and tending for mixed feeding. Yet, the methodology may not fit the international comparison.

### UNICEF database:

No published data for KSA

### World Bank data base:

Based on the World Bank database, which seems to refer to a survey conducted in 1996 in KSA, the prevalence of exclusive breastfeeding was reported at 31% [22]. This figure was actually represented both exclusive and predominant breastfeeding under 4 months of age based on the older definition for exclusive breastfeeding

### Infant nutrition data from National Nutrition Surveillance:

The infant nutrition data was organized collectively by general administration of nutrition and epidemiology departments. The latest data 2015-2020 were carried out from five regions through primary care centers affiliated to MOH. The sample in the surveillance did not include data from other health services, however, children vaccination is not restricted to these services and open for children in Saudi Arabia including visitors. The indicators on infant nutrition are valuable, however it is not per WHO methodology. The sample size for children below 2 years is not recorded.

**Table 18: Infant nutrition data in a National Nutrition Surveillance 2020**

Year	Sample size (children less than 5 years)	% of breastfeedi ng birth to 24 months	Mean duration of breastfeeding	% of bottle feeding in the first month	% mixed (breastfeeding and breast milk substitutes)
2015	6890	15.3	5.7	75.6	69.3
2016	4797	23	6.2	65.5	68.2
2017	7822	21.9	6.1	68.7	60.6
2018	6887	9.4	5	79	75.4
2019	6374	16.4	5.6	75.9	71.5



<b>2020- COVID</b>	2912				
	(Alhessa 66%, Hail 14.6%, Medina 9.3%, Qassim 7.4%, Northern borders 2.6%)	13.4	5.8	84.3	76.1

Source: Lamy AL Hamdan (coordinator of Nutrition surveillance)

#### General authority of Statistics:

General authority of statistics is regularly carrying out multiple indicator cluster survey (MICS) which is currently carried on yearly basis. Breastfeeding practice survey is included within women health and reproductive survey. The methodology and questionnaire for breastfeeding indicators were under review and update. The data of Breastfeeding Indicator data from general authority of statistics was studied and also compared to the Kanz breastfeeding 2023 as seen in table 19.

For survey of 2018, the definition of exclusive breastfeeding in the report was focused on absence of adding the milk formula only. The questionnaire was reviewed and the definition was focused on breastfeeding, milk formula and mixed (breastfeeding and milk formula). This doesn't apply to precise nutrition definition of exclusive breastfeeding and WHO methodology. There was no data on early initiation of breastfeeding in this survey. Exclusive breastfeeding under six months may have overestimate if other food was not considered.

For survey 2023, breastfeeding indicators were part of women and reproductive health survey. The were five questions about breastfeeding within women health survey. The sample size of 2023 survey may be small. The question of exclusive breastfeeding is not similar to WHO methodology and difficult to compare. However, the question on early initiation was good, but is preferable to mentions the choices of time for more accuracy.

For 2024 survey, several meetings to update the question of breastfeeding. The data of breastfeeding indicators in 2024 data was discussed. The question on early initiation was good but the figure may be overestimated if never breastfeeding are not included in the denominator. Bottle with teat use was present nicely taken and was above 70%.

**Table 19: Comparison of Kanz breastfeeding 23 and GASTAT for international indicators\*.**

Breastfeeding Indicators	Kanz BF 23	GASTAT (year)
Early initiation of breastfeeding	<b>43.4%</b>	- Not available in 2018 - 56.9% in 2023 - high in 2024
Exclusive breastfeeding under six months	<b>15.5%</b>	- 42% in 2018
Bottle use with teat	<b>NA</b>	-75.8%



**Table 20: Summary of national data from previous published studies at KSA**

Source	Date and Location	Sample size	Ever (or Any) breastfeeding	Early Initiation of Breastfeeding	Exclusive Breastfeeding (6 Months=M)
<b>Present Project (unpublished)</b>	2023, national	9242 children	89.3%	43.4%	15.5%
<b>Alahmed et al 2023 [9]</b>	Meta-analysis of randomized clinical trials and cross-sectional studies		---	31.5%	<2 M: 57.2% at 6 M: 15.15%
<b>Ahmed and Salih 2019 [9]</b>	2019, national, Saudi,	1700 mothers	91.7%	43.6%	-
<b>KSAWHS [9]</b>	2019, national	-	85.7%	37.7%	-
<b>Al Juaid et al [7]</b>	National, 2014	Several cross-sectional studies	above 90%	decline in duration of breastfeeding -	
<b>El Mouzan et al 2009 [23]</b>	2004-05, National	5339 women with children aged less than 3 years	91.6%	23.2%	At Birth: 70.8% At 1 M: 39% At 4 M:16.4% At 6 M: 8%
<b>Al-Jassir et al 2006 [24]</b>	2002-03, National	4872 mothers and their youngest child	> 91.9%	-	23.9%
<b>Khoja et al 2000 [25]- World bank</b>	1996, National	6665, children born in the last 3 years	87%	18% (36% exclusive & predominant)	Exclusive & Predominant < 4 M:31%
<b>Alshehri et al 1995 [29]</b>	1995, National	6308	95%	-	Breastfeeding < 5 M:53%
<b>Al-Mazrou. et al 1994 [25]</b>	1987, National	6131	90%	-	at 0-1 M: 55% at 2-3 M:36% at 4-5 M: 37%

**Publication plan:**

The main project lead team proceeded for research approval and ethical IRB in the middle of 2023. This was followed by extension of some of team work in 2024 to continue studying and writing the results, and arrange publication in scientific journal in 2024. A list of authorship points was made by the core group and invited members who may fulfill the criteria of authorship for scientific based on the evaluation was undertaken. The directorate members were informed about the points in Septembers 2023 meeting to clarify the authorship per research ethics and allow a chance for all to learn and contribute, appendix 20.

All selected invited authors for scientific publication were ensured to have ethical research certificates and updated list in IRB was made.

Breastfeeding surveys and regions publication was updated.

Several meetings for writing and revision of the manuscript



Approval of publication was obtained from research administration of (IRB) in 2024.

Journal selection was made and process of journal publication was carried out.

Publication to concerned sectors was planned.

**SCORE:**

Several forms for survey population and health risks were studied.

Score guideline for research publication was performed.

**Strategic indicators VS Operational indicators:**

National, subnational, facility indicators are important to be studied and assessment for all need to be considered with great caution to fit the goal.

**Tamkeen Contest:**

The project was applied for Tamkeen prize but unfortunately did not win!.



## 12. Effect of the Project

An electronic google based survey was sent randomly to a number of interviewers to help describe their perceptions of the project's impact. The summary was as follows:

The project's contribution at the:

### Organizational level:

- A baseline data for the estimation of the national breastfeeding indicators using standardized updated international methodology
- Establishing an international comparison with the developed countries.
- Strong drive for intervention to improve the downward trends in breastfeeding

### Staff level:

- Advancing skills in breastfeeding indicators' surveys
- Advancing skills in electronic platforms and excels
- Empowering national commitment towards better health
- Learning about quality control measures
- Volunteering, team work and leadership skills
- Time management skills
- Communicating with parents in relation to breastfeeding practices in the community

### Parents' level:

- Highlighting the importance of breastfeeding through the survey by the ministry of health

Breastfeeding practice survey vs health survey:

Breastfeeding survey vs merged infant nutrition survey was discussed with General administration of Statistics and public health authority (Wegaya).

There were three governmentally funded national health survey (World health survey lead by general administration of statistics, Nutrition health survey lead by Wegaya and family health survey lead by general authority of statistics), A question to have the most suitable survey for breastfeeding practice is under discussion. Budget allocation was raised. Funding the breastfeeding research projects was raised.

### 13. SWOT Analysis

A preliminary SWOT analysis for the project is shown below:

Phase 1			
S Strengths	W Weaknesses	O Opportunities	T Threats
<p>The standardized method adopted in the evaluation of breastfeeding indicators allows for the comparison with other countries and for future trend assessment.</p> <p>Clear calculation methods for the indicators are provided in the WHO 2021 guideline document</p> <p>The Health Volunteering system which allowed to recruit health practitioners volunteers</p> <p>Response rate was of approximately 70%, showing that the implemented approach works well in the Saudi setting</p> <p>Directorate of health affair response to the project in general</p>	<p>New SHAHM application with many technical difficulties</p> <p>Difficulties in reaching mothers when the registered phone numbers are for the fathers</p> <p>Readiness of the region's health affairs for health survey taskforce</p> <p>Caution/lack of trust on behalf of the participants due to lack of media or unified phone for survey</p> <p>Time pressure as the assessment period was overlapping two Eid vacations</p> <p>Lack of previous data on breastfeeding indicators in KSA and hence inability to assess trend</p>	<p>Enhancing the directorates' capacity to conduct the interviews (staff and phone's access)</p> <p>Improving the SHAHM system to further facilitate data entry and extraction</p> <p>Information campaign about the project to increase the public's trust and willingness to participate</p> <p>The generated data will serve as a baseline for national monitoring purposes</p> <p>The collaboration with statistics agencies to improve the indicators recording</p>	<p>Delays in producing the national breastfeeding indicators</p> <p>Inability to reach the target sample size and proportions per regions</p> <p>Break in confidentiality of patient data</p>





Phase 2			
S Strengths	W Weaknesses	O Opportunities	T Threats
Availability of mother's phone numbers  Support of 937  Use of a friendly data entry tool (Excel) with freezing for dates and duplicates  Large sample of participants  IRB approval was obtained for the project ( <b>Appendix 19</b> )	Data extraction for 0-6 months alone  Withdrawal of almost 50% of field coordinators and delay of data collection initiation in three regions  Excel report date of birth with differences in days or months	Research publication  Better evaluation of the indicators with weighted sample method	Over estimates from 0-6 months age group  Possibility of yearly calculation  Mistakes in date of births which required double data cleaning  Time pressure on central committee to cope with many regions data collection

Several challenges were encountered at various levels. These can be summarized as follows:

*Central Organization:*

- The need for collaborative works from different sections at MOH, which demanded time.
- Unavailability of a biostatistician at MOH for supporting the project and of staff who have previous experience in the indicators.
- Tight timeline with twice per year for the indicators; there is a need to change to a yearly plan in both phases.
- The new SHAHM portal for entering the questionnaires had many technical difficulties (SHAHM was used in phase 1 only; Data entry moved to Excel sheets in phase2 given the technical difficulties encountered with SHAHM in phase 1).
- Lack of complete data for the birth registration in the MOH portal such as the mobile phone number of the mother or even the father (which were not present in many cases, or were wrong).
- Lack of designated MOH phone number for the survey project in the regions , it was limited to be used for Digital city staff.
- Lack of media support for the project
- Lack of previous more recent data in the country based on the WHO guidelines to compare the project outputs.
- Lack of data for some G20 countries in the UNICEF database for the breastfeeding indicators to compare the project outputs. Additional data sources were consulted for these countries.
- Multiple breastfeeding indicators need to be addressed together, with difficulty to prioritize one over the others.



- Different measures and definitions for breastfeeding indicators exist in the literature.
- Limited budget for the project.

*Directorate of Health Affairs:*

*Phone calls:*

- Phone numbers were wrong or not for the assigned people.
- The available contact phone numbers were mostly for fathers in the first phase especially which was improved in the second phase.
- Lack of response from many families on the phone call (No response despite 3 trials of phone calls on different days and times).

*Technical issues encountered while using SHAHM in phase 1 of the project:*

- Multiple challenges in sham application including difficulty in submission, data entry several times, difficulty in extraction of some data and open questions.

*Volunteering issues:*

- The opportunity for volunteering is one month only on the volunteering office's system.
- The time period for placing the request and then training the volunteering staff was short.
- It was easy for the volunteers to leave the project.
- The large number of volunteering staff can compromise the confidentiality of subjects' data.
- Lack of dedicated staff for the project

*Parents:*

- Excessive caution to give the data via phone to anyone even with 937 use
- Ridiculing and mocking the interviewers.
- Fathers' unwillingness to share the mothers' phone numbers.
- Refusal to participate despite calling at different times of the day.

*Child:*

- Presence of a new child or twin in addition to the selected child in the family.

*Poster:*

- Difficulty to send the poster to every participant.

*Data:*

Under or Overestimate in age groups need to be dealt cautionary with biostatics help in order to have weighted sample.



## 14. Next steps

The envisaged next steps are as follows:

- Consider feedback report on data collection submitted by the coordinators in the different governorates (**Appendix 10**).
- Proceed for research project writing for the year 2024 for international publication.
- Publish the indicators to make them available for all stakeholders of breastfeeding
- Establish a platform on MOH portal for breastfeeding indicators.
- Formation of agreement with universities for volunteers for the next year.
- Formation of agreement with suitable national sectors for collaboration for continuous monitoring
- Visit other countries who have established monitoring and successes to raise breastfeeding indicators like USA.
- Plan a longer phase of data collection period over one year (six months as minimum).
- Supervise data collection seriously to minimize data cleaning.
- Fix the date of birth in written letter for month name.
- Record the mother's phone numbers of upon discharge on the MOH portal as a must.
- Consider either collaboration with health colleges of university or to shift the interviews to health care centers (hospital and primary care centers) with dedicated staff who are not providing the health services.
- Launch media support for the project to build confidence amongst the families.
- Use uniform MOH phone number like 937.
- Ensure that the age of the selected children is less than 24 months.
- Interviewer to be available for day time or evening time data collection to increase family response.
- Increase the time over the year round with consideration of national holidays.
- Limit the number of staff for volunteering team except for highly populated areas.
- Secure resources and dedicated staff for the project
- Adopt a friendly online platform for data entry such as KOBO.
- Arrange the training in electronic and pre-registered platform
- Publish the findings in a scientific manuscript. Authorship guidelines were clarified, and these are included in Appendix 20.
- This survey paves the way for subsequent surveys that use the same methodology to establish trend over time in breastfeeding practices in KSA. As such, the data generated by this survey will be compared with KANZ breastfeeding 2024 and other future surveys.
- It is recommended to evaluate the attitude towards milk formula, bottle use, complementary food in the future to complete the picture on IYC nutrition.

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## Project logo (identity)



كفالة  
الرضاعة  
الطبيعية



## Appendix 2

# Mapping of national bodies carrying out national breastfeeding indicators regular data management in KSA

Title	Department	Indicators	Years	Summary Results
Nutrition surveillance	General administration of nutrition and epidemiology department	<ul style="list-style-type: none"> <li>• Introduction of milk formula at one month.</li> <li>• Mixed feeding for infant.</li> <li>• Complementary food.</li> </ul>	2011-2020  Yearly surveillance at MOH primary care centers centile sites	<ul style="list-style-type: none"> <li>• Drop in practice of breastfeeding with increase to</li> <li>• Introduce milk formula early in the first month</li> <li>• Increase mixed breast milk and milk formula feeding</li> </ul>
World health survey report	Health transformation	<ul style="list-style-type: none"> <li>• Early initiation of breastfeeding in the first hour</li> </ul>	2019	Ealy initiation of breastfeeding was 43%
Raising breastfeeding in the hospitals	General nutrition administration	<ul style="list-style-type: none"> <li>• Percentage of milk formula use at discharge</li> </ul>	2018-ongoing	Focus on skin to skin contact and breastfeeding at discharge
Breastfeeding repository	Research committee, general administration of nutrition	<ul style="list-style-type: none"> <li>• Publication in breastfeeding from Saudi Arabia Collection of papers (national or regional or cities)</li> </ul>	Collection is yearly for an update	Several publications with difference in definition The last published on breastfeeding in 2019 focusing on early initiation of breastfeeding
National health survey	General authority of statistics	<ul style="list-style-type: none"> <li>• Median of ever breastfeeding,</li> <li>• exclusive breastfeeding, and duration of breastfeeding</li> </ul>	2018	Current survey is ongoing 2023 ( waiting for the results) The current breastfeeding as per WHO was not present in the questionnaire sent for overview.





## IYCF indicators – UNICEF -WHO 2021

## قائمة مؤشرات الرضاعة الطبيعية المحدثة

Indicator	Short name	Age group	Definition	
<b>Breastfeeding indicators</b>				
1	Ever breastfed	EvBF	Children born in the last 24 months	Percentage of children born in the last 24 months who were ever breastfed
2	Early initiation of breastfeeding	EIBF	Children born in the last 24 months	Percentage of children born in the last 24 months who were put to the breast within one hour of birth
3	Exclusively breastfed for the first two days after birth	EBF2D	Children born in the last 24 months	Percentage of children born in the last 24 months who were fed exclusively with breast milk for the first two days after birth
4	Exclusive breastfeeding under six months	EBF	Infants 0–5 months of age	Percentage of infants 0–5 months of age who were fed exclusively with breast milk during the previous day
5	Mixed milk feeding under six months	MixMF	Infants 0–5 months of age	Percentage of infants 0–5 months of age who were fed formula and/or animal milk in addition to breast milk during the previous day
6	Continued breastfeeding 12–23 months	CBF	Children 12–23 months of age	Percentage of children 12–23 months of age who were fed breast milk during the previous day

المؤشر	الاختصار	الفئة العمرية	التعريف
<b>مؤشرات الرضاعة الطبيعية</b>			
١	EvBF	الأطفال المولودين في ٢٤ شهراً الماضية	نسبة الأطفال المولودين في ٢٤ شهراً الماضية الذين أرضعوا أي رضاعة طبيعية
٢	EIBF	الأطفال المولودين في ٢٤ شهراً الماضية	نسبة الأطفال المولودين في ٢٤ شهراً الماضية ووضعوا على الصدر خلال الساعة الأولى بعد الولادة
٣	EBF2D	الأطفال المولودين في ٢٤ شهراً الماضية	نسبة الأطفال المولودين في ٢٤ شهراً الماضية الذين أرضعوا رضاعة طبيعية حصرياً في أثناء اليومين الأولين بعد الولادة
٤	EBF	الرضع منذ الولادة إلى عمر ٥ أشهر	نسبة الرضع في عمر ٥-٠ أشهر الذين أرضعوا لبن الأم حصرياً خلال اليوم السابق
٥	MixMF	الرضع منذ الولادة إلى ٥ أشهر	نسبة الرضع في عمر ٥-٠ أشهر الذين أرضعوا اللبن الصناعي أو اللبن حيواني المصدر إضافة إلى لبن الأم خلال اليوم السابق
٦	CBF	الأطفال في عمر ١٢-٢٣ شهراً	نسبة الأطفال من عمر ١٢ إلى ٢٤ شهراً الذين أرضعوا لبن الأم خلال اليوم السابق





## استبانة مقابلات مشروع تقييم مؤشرات الرضاعة الطبيعية المحلية

عزيزتي الأم، عزيزي مقدم الرعاية للطفل،  
مرحبًا بكم، نحن فريق من وزارة الصحة نعمل في مشروع كنز الرضاعة الطبيعية. نقوم في  
هذا المشروع بمقابلة بالهاتف مع الأمهات أو أفراد الأسرة لأخذ بيانات عن تغذية طفلكم.  
جميع المعلومات التي نحصل عليها منك ستبقى سرية للغاية ومجهولة الهوية.  
سوف تستغرق هذه المقابلة بضعة دقائق.

**ملاحظة: الاستبانة سرية للغاية، ويمنع تداولها لغير المكلفين في المشروع.**



بيانات الطفل المشارك من مستند الاكسل قوائم الطفل وأسرته	
١	الرقم التسلسلي: من الاكسل ويلزم دقة عالية
٢	اسم المنطقة: (من الاكسل) <input type="checkbox"/> الأحساء (AH) <input type="checkbox"/> بيشة (BE) <input type="checkbox"/> جدة (JE) <input type="checkbox"/> القصيم (QS) <input type="checkbox"/> الباحة (BA) <input type="checkbox"/> الشرقية (SH) <input type="checkbox"/> مكة المكرمة (MK) <input type="checkbox"/> القريات (GR) <input type="checkbox"/> الجوف (JF) <input type="checkbox"/> حفر الباطن (HB) <input type="checkbox"/> المدينة المنورة (MN) <input type="checkbox"/> الرياض (RD) <input type="checkbox"/> القنفذة (GN) <input type="checkbox"/> حائل (HL) <input type="checkbox"/> نجران (NJ) <input type="checkbox"/> تبوك (TB) <input type="checkbox"/> عسير (AS) <input type="checkbox"/> جازان (JZ) <input type="checkbox"/> الحدود الشمالية (NS) <input type="checkbox"/> الطائف (TF)
٣	القطاع الذي يتبع المستشفى التي تمت الولادة فيه: (من الاكسل) <input type="checkbox"/> وزارة الصحة <input type="checkbox"/> القطاع الحكومي <input type="checkbox"/> القطاع الخاص
٤	تاريخ ميلاد الطفل (ميلادي): : (من الاكسل ولزم دقة عالية جدا عند النقل) اليوم ( ) الشهر ( ) السنة ( ) م
بيانات جامع البيانات والموافقة على المشاركة	
٥	اسم جامع البيانات: (من قام بالمقابلة بالهاتف مع الأم) الاسم الأول ( ) اسم العائلة ( )
٦	تاريخ إجراء المقابلة (ميلادي): (تسجيل اليوم الذي تم أخذ البيانات من الأم) اليوم ( ) الشهر ( ) السنة ( ) م
٨	صلة القرابة مع الطفل المستهدف للمجيب على الاستبانة: <input type="checkbox"/> الأم <input type="checkbox"/> إحدى القريبات <input type="checkbox"/> الحاضنة <input type="checkbox"/> الأب <input type="checkbox"/> أخرى <b>يفضل إجراء المقابلة مع الأم الوالدة، ويمكن إجراء المقابلة مع غيرها ممن يقدم الرعاية للطفل حين عدم الإمكانية كوفاتها</b>
٧	هل توافقين على المشاركة معنا في إعطاء بيانات عن تغذية الطفل؟ <input type="checkbox"/> أوافق المشاركة <input type="checkbox"/> لا أوافق المشاركة ← سنتحدث معك عن [اسم الطفل]، كيف صحته؟ ← إذا اتضح أن الطفل المشارك ميتاً، نرجو مراعاة المشورة والتواصل المناسب مع الأسرة، ولا تطرح الأسئلة عن الرضاعة الطبيعية الحالية (بالأمس) ← في حال الإجابة بـ"لا أوافق" نأمل عدم إكمال المقابلة مع السيدة وتحفظ البيانات الأولى في الاكسل وتكتب غير موافق
البيانات الاجتماعية للأم الوالدة	
٩	العمر (بالسنوات):
١٠	الحالة الاجتماعية: <input type="checkbox"/> متزوجة <input type="checkbox"/> مطلقة <input type="checkbox"/> أرملة <input type="checkbox"/> أخرى
١١	العمل: <input type="checkbox"/> ربة بيت <input type="checkbox"/> طالبة <input type="checkbox"/> امرأة عاملة
١٢	التعليم: <input type="checkbox"/> أمية (لا تقرأ ولا تكتب) <input type="checkbox"/> الثانوية وأقل <input type="checkbox"/> الدبلوم والجامعي <input type="checkbox"/> فوق الجامعي



البيانات الاجتماعية والصحية للطفل	
١٣	عمر [اسم الطفل]: نرجو المطابقة مع تاريخ الميلاد واستبعاد الطفل لمن هو فوق 24 شهرا ، وعدم اكمال الاستبانة. ( ) يوم ( ) شهر <input type="checkbox"/> متوفى
١٤	جنس [اسم الطفل]: <input type="checkbox"/> ولد <input type="checkbox"/> بنت
١٥	جنسية [اسم الطفل]: <input type="checkbox"/> سعودي <input type="checkbox"/> غير سعودي ( <input type="checkbox"/> تُكتب الجنسية
١٦	ترتيب [اسم الطفل] في الأسرة: <input type="checkbox"/> الأول <input type="checkbox"/> غير ذلك
١٧	نوع ولادة [اسم الطفل]: <input type="checkbox"/> طبيعية <input type="checkbox"/> قيصرية
١٨	العمر الحملي عند ميلاد [اسم الطفل]: <input type="checkbox"/> مكتمل (٣٧ أسبوعاً فما فوق) <input type="checkbox"/> غير مكتمل (أقل من ٣٧ أسبوعاً)
١٩	وزن [اسم الطفل] عند الميلاد: ( ) كجم <input type="checkbox"/> لا أعلم
الأسئلة عن تغذية الطفل بعد الولادة مباشرة (يشمل الطفل الحي والميت)	
٢٠	هل سبق أن تم إرضاع [اسم الطفل] رضاعة طبيعية؟ (ولو مرة واحدة) <input type="checkbox"/> نعم <input type="checkbox"/> لا يقصد بالرضاعة الطبيعية: الرضاعة من ثدي الأم الوالدة مباشرة أو التغذية بالحليب المعتصر منها أو الرضاعة من المراضع غير الأمهات الوالدات سواء مباشرة أو الحليب المعتصر.
٢١	كم استغرق الوقت لوضع [اسم الطفل] على الثدي لأول مرة بعد الولادة؟ <input type="checkbox"/> فوراً <input type="checkbox"/> أقل من ساعة <input type="checkbox"/> ساعات: ( ) <input type="checkbox"/> أيام: ( ) دون عدد الساعات دون عدد الأيام يقصد بوضع الطفل على الصدر أن المولود أعطي فرصة ليرضع من ثدي الأم ولا يلزم أن يكون تعلق بالحلمة أو مص الثدي أو انتقال الحليب إلى جوفه.
٢٢	هل أعطيت [اسم الطفل] في أول يومين بعد الولادة أي شيء آخر غير حليب الأم مثل الماء، أو الحليب الصناعي، أو شراب الأعشاب أو الحلبة أو منقوع التمر وغيره؟ <input type="checkbox"/> نعم: اذكر ما تناوله الطفل ( ) <input type="checkbox"/> لا • التحنيك بوضع التمر في الفم لا يشمل المشروبات أو التغذية • في حالة وجود فيتامينات أو أدوية أو محلول جفاف فموي فلن يخل ذلك بحصرية الرضاعة الطبيعية؟



الأسئلة عن الرضاعة الطبيعية الحالية (الأطفال الأحياء فقط)

٢٣	هل أَرْضِع [اسم الطفل] رضاعةً طبيعية يوم أمس في أثناء النهار أو في الليل؟ نعم <input type="checkbox"/> لا <input type="checkbox"/> لا أعلم <input type="checkbox"/>
٢٤	هل تناول [اسم الطفل] بالأمس الماء العادي؟ نعم <input type="checkbox"/> لا <input type="checkbox"/> لا أعلم <input type="checkbox"/>
٢٥	هل تناول [اسم الطفل] بالأمس الحليب الصناعي الخاص بالرضع مثل سيملاك أو نان أو رونلاك؟ نعم <input type="checkbox"/> لا <input type="checkbox"/> لا أعلم <input type="checkbox"/>
٢٦	هل تناول [اسم الطفل] بالأمس الحليب حيواني المصدر، مثل: الحليب الطازج، أو المعبأ، أو المسحوق؟ نعم <input type="checkbox"/> لا <input type="checkbox"/> لا أعلم <input type="checkbox"/>
٢٧	هل تناول [اسم الطفل] بالأمس اللبن رائب والزبادي مصنوع من حليب الحيوانات؟ نعم <input type="checkbox"/> لا <input type="checkbox"/> لا أعلم <input type="checkbox"/>
٢٨	هل تناول [اسم الطفل] بالأمس المشروبات المُطعمَة بنكهات الشوكولاتة؟ نعم <input type="checkbox"/> لا <input type="checkbox"/> لا أعلم <input type="checkbox"/>
٢٩	هل تناول [اسم الطفل] بالأمس عصائر الفواكه أو المشروبات المُطعمَة بنكهة الفواكه؟ نعم <input type="checkbox"/> لا <input type="checkbox"/> لا أعلم <input type="checkbox"/>
٣٠	هل تناول [اسم الطفل] بالأمس المشروبات الغازية، أو مشروبات الشعير، أو المشروبات الرياضية، أو مشروبات الطاقة؟ نعم <input type="checkbox"/> لا <input type="checkbox"/> لا أعلم <input type="checkbox"/>
٣١	هل تناول [اسم الطفل] بالأمس مشروبات الشاي، أو القهوة، أو الأعشاب؟ نعم <input type="checkbox"/> لا <input type="checkbox"/> لا أعلم <input type="checkbox"/>
٣٢	هل تناول [اسم الطفل] بالأمس المرق أو الحساء الصافي؟ نعم <input type="checkbox"/> لا <input type="checkbox"/> لا أعلم <input type="checkbox"/>
٣٣	هل تناول [اسم الطفل] بالأمس أي سوائل أخرى؟ نعم <input type="checkbox"/> لا <input type="checkbox"/> لا أعلم <input type="checkbox"/>
٣٤	هل تناول [اسم الطفل] بالأمس أي طعام مهروس أو شبه صلب أو صلب (مثل الأرز أو السيرلاك أو الفواكه أو الخضار أو البيض أو اللحوم أو البقول وغيره)؟ نعم <input type="checkbox"/> لا <input type="checkbox"/> لا أعلم <input type="checkbox"/>

الملاحظات



## Interview questionnaire for National Breastfeeding Indicators Assessment

Dear mother, dear child caregiver,

You are most welcome,

We are a team from the Ministry of Health working on the Breastfeeding Treasure Project.

In this project, we conduct a telephone interview with mothers or family members to take data on the child's nutrition.

All information we obtain from you will remain strictly confidential and anonymous.

***Note: The questionnaire is strictly confidential. Do not share it with anyone other than those assigned to the project.***



Data of participant child adapted from the excel sheet of the child and his family	
1	<b>Serial number:</b> <b>Write the capital letters of the region and the number accurately from the excel</b>
2	<b>District: (from Excel)</b> <input type="checkbox"/> Alahsa (AH) <input type="checkbox"/> Bisha (BE) <input type="checkbox"/> Jeddah (JE) <input type="checkbox"/> Qassim (QS) <input type="checkbox"/> Albaha (BA) <input type="checkbox"/> Eastern Province (SH) <input type="checkbox"/> Makkah AlMukarramah (MK) <input type="checkbox"/> AlQurayat (GR) <input type="checkbox"/> Al-Jouf (JF) <input type="checkbox"/> Hafar Albatin (HB) <input type="checkbox"/> Medina Almunawara (MN) <input type="checkbox"/> Riyadh (RD) <input type="checkbox"/> Alqunfudhah (GN) <input type="checkbox"/> Hail (HL) <input type="checkbox"/> Najran (NJ) <input type="checkbox"/> Tabuk (TB) <input type="checkbox"/> Aseer (AS) <input type="checkbox"/> Jazan (JZ) <input type="checkbox"/> Northern Borders (NS) <input type="checkbox"/> Taif (TF)
3	<b>The sector that follows the hospital in which the birth took place: (from Excel)</b> <input type="checkbox"/> Ministry of Health <input type="checkbox"/> Government sector <input type="checkbox"/> Private sector
4	<b>Date of child birth (Georgian) : (from Excel and needs to be taken accurately)</b> Day (    ) Month (    ) Year (    ) AD
Interviewer Data and Informed Consent	
5	<b>Name of interviewer: (from Excel)</b> First name (    ) Last name (    )
6	<b>Data of interview (Gregorian): (It is the day that data taken from the mother by phone)</b> Day (    ) Month (    ) Year (    ) AD
7	<b>Child relationship to the respondent to the questionnaire:</b> <input type="checkbox"/> Mother <input type="checkbox"/> Relative <input type="checkbox"/> Babysitter <input type="checkbox"/> Father <input type="checkbox"/> Other <i>It is preferable to conduct the interview with the child mother, and it is possible to conduct it with others who provide care for the child when it is not possible, such as death</i>
8	<b>Do you agree to participate with us in providing data on child nutrition?</b> <input type="checkbox"/> I agree to participate <input type="checkbox"/> I do not agree to participate ← We'll talk with you about your child [NAME]; how is his/her health?      → If the answer is "I do not agree," we hope not to complete the interview with the lady ← If it turns out that the participant child is deceased, please consider advice and appropriate communication with the family; avoid inquiring about current child's nutrition      → Register the data in excel and choose don't agree
Social Data of the Mother (who give birth of the child)	
9	<b>Age (years):</b>
10	<b>Social status:</b> <input type="checkbox"/> Married <input type="checkbox"/> Divorced <input type="checkbox"/> Widow <input type="checkbox"/> Other
11	<b>Work status</b> <input type="checkbox"/> Housewife <input type="checkbox"/> Student <input type="checkbox"/> Working woman
12	<b>Education:</b>







Questions about current breastfeeding (alive babies only)	
23	<p><b>Was [NAME] breastfed yesterday during the day or at night?</b></p> <p><input type="checkbox"/> Yes                      <input type="checkbox"/> No                      <input type="checkbox"/> I don't know</p>
24	<p><b>Was [NAME] fed plain water yesterday?</b></p> <p><input type="checkbox"/> Yes                      <input type="checkbox"/> No                      <input type="checkbox"/> I don't know</p>
25	<p><b>Was [NAME] fed infant milk formula such as Similac, Ronelac, or Nan yesterday?</b></p> <p><input type="checkbox"/> Yes                      <input type="checkbox"/> No                      <input type="checkbox"/> I don't know</p>
26	<p><b>Was [NAME] fed milk from animals such as fresh, tinned or powdered milk yesterday?</b></p> <p><input type="checkbox"/> Yes                      <input type="checkbox"/> No                      <input type="checkbox"/> I don't know</p>
27	<p><b>Was [NAME] fed yogurt drinks from animal sources yesterday?</b></p> <p><input type="checkbox"/> Yes                      <input type="checkbox"/> No                      <input type="checkbox"/> I don't know</p>
28	<p><b>Was [NAME] fed chocolate-flavored drinks yesterday?</b></p> <p><input type="checkbox"/> Yes                      <input type="checkbox"/> No                      <input type="checkbox"/> I don't know</p>
29	<p><b>Was [NAME] fed fruit juice or fruit-flavored drinks yesterday?</b></p> <p><input type="checkbox"/> Yes                      <input type="checkbox"/> No                      <input type="checkbox"/> I don't know</p>
30	<p><b>Was [NAME] fed sodas, malt drinks, sports drinks, or energy drinks yesterday?</b></p> <p><input type="checkbox"/> Yes                      <input type="checkbox"/> No                      <input type="checkbox"/> I don't know</p>
31	<p><b>Was [NAME] fed tea, coffee, or herbal drinks yesterday?</b></p> <p><input type="checkbox"/> Yes                      <input type="checkbox"/> No                      <input type="checkbox"/> I don't know</p>
32	<p><b>Was [NAME] fed clear broth or clear soup yesterday?</b></p> <p><input type="checkbox"/> Yes                      <input type="checkbox"/> No                      <input type="checkbox"/> I don't know</p>
33	<p><b>Was [NAME] fed other fluids yesterday?</b></p> <p><input type="checkbox"/> Yes                      <input type="checkbox"/> No                      <input type="checkbox"/> I don't know</p>
34	<p><b>Was [NAME] fed any food that is mashed, semisolid or solid (rice, Cerleac, fruit, vegetable, egg, meat, legumes, other) yesterday?</b></p> <p><input type="checkbox"/> Yes                      <input type="checkbox"/> No                      <input type="checkbox"/> I don't know</p>
<b>Comments</b>	



## Field coordinators' duties

### مهام المنسق

- ممارسة صحي يعمل في المديرية مكلف للمشروع بالإضافة لعمله.
- التنسيق مع ديوان الوزارة (الفريق المركزي للمشروع) لإجراء المهام المطلوبة من التردد للممارسة الرضاعة الطبيعية الخاص بالمنطقة التي يتبع لها.
- حضور اجتماعات فريق المشروع.
- حضور الدورات التدريبية الخاصة بالمشروع.
- اعداد الفريق المشارك في المديرية (إن لزم الأمر).
- التنسيق مع منصة التطوع الصحي عند الحاجة لمساعدين في الرصد.
- التواصل مع أصحاب المصلحة داخل المديرية (مثل إدارة السجلات وإدارة التراخيص وغيرهم) للحصول على بيانات الأمهات أو خارج المديرية إن لزم الأمر.
- تكوين ملف خاص بالمشروع للمنسق في المديرية.
- المحافظة على سرية البيانات.
- التأكد من توفر المكان والهاتف الخاص بالمديرية لإجراء المقابلات مع السيدات.
- تدريب الفريق المساعد داخل المديرية بنفس الآلية حسب التدريب لها في إجراء المقابلات.
- التأكد من إجراء المقابلات بالطريقة السليمة.
- التواصل مع أصحاب المصلحة في المديرية أو غيرها.
- التعاون مع الفريق المركزي عند الحاجة.
- ما يكلف به من مهام أخرى تابعة للمشروع.



## Data collection plan

### آلية إجراء المقابلات لمشروع تقييم مؤشرات الرضاعة الطبيعية المحلية في المديرية

	اسم المنطقة أو المحافظة
	منسق مديرية الشؤون الصحية
	الإدارة التي يتبع لها منسق المديرية
	عدد المقابلات المخطط له
	الفترة الزمنية المخطط لها
	مكان إجراء المقابلات
	رقم الهاتف الذي سيرسل منه رسائل الإعلان (البوستر)
	ارقام الهواتف التي ستستخدم في المقابلات (خاصة بوزارة الصحة)
	شرح آلية تقديم المقابلات
	الآلية تقديم الشكر للمشاركين في المقابلات
	اعتماد صاحب الصلاحية - رئيس القسم

أسماء المشاركين في المقابلات		
رقم الجوال	ايميل وزارة الصحة	الاسم



## Certificate of training completion

  
وزارة الصحة  
Ministry of Health

  
الجمعية  
الوطنية  
للحقوق  
الإنسانية

### شهادة حضور

تشهد الإدارة العامة للتغذية بأن الممارس الصحي:

قد حضر البرنامج التدريبي في إجراء المقابلات الهاتفية مع الأمهات الخاصة بمشروع:

**تقييم مؤشرات الرضاعة الطبيعية المحلية**

وذلك في شهر مايو عام ٢٠٢٣ م

سائلين الله دوام التوفيق والسداد

المدير العام للإدارة العامة للتغذية  
د.علي فرج ال رشيد

مدير المشروع  
د.فوزية الحريشي

Appendix 10

تقرير مشروع مؤشرات الرضاعة الطبيعية المحلية (الجولة الأولى)

		المنطقة
	تخصص المنسق	المنسق في المنطقة
		الإدارة التابع لها المنسق
		مدير الإدارة
	تاريخ خطاب ترشيح المنسق	تاريخ وصول التعميم للإدارة
		تاريخ ارسال الخطة المبدئية
	حجم العينة بالعدد المضاف	حجم العينة الفعلية للمنطقة
	العدد الكلي للمجري المقابلات فعلياً	العدد الكلي للمتدربين
(.....) متطوعة	(.....) موظفة	فئة مجري المقابلات الفعلي:
	المنسحبات من الموظفين المكففات (إن وجد)	المنسحبات من منصة التطوع ( إن وجد)
		الية ارسال البوستر
		تاريخ ابتداء المقابلات وادخال البيانات في المنطقة
		تاريخ الانتهاء من جمع البيانات
	عدد المقابلات:	تقييم الإنجاز
	عدد الرفض:	
	عدد اللاتي لم ترد أو مشكلة في الرقم الخ.	
	عدد اللاتي لم يتم الاتصال بهم	
		آلية تسلسل انجاز المشروع
		• • • •
	الحلول المقترحة	الصعوبات والمعوقات
		اقتراحات تطويرية
		• • • •



## Template document for the collection of the field coordinators' contact details

### بيانات المنسقين

الايمل	الهاتف	الاسم	مديرية الشئون الصحية	العدد	القطاع
			منطقة الرياض	1	القطاع الأوسط
			منطقة القصيم	2	
			منطقة حائل	3	
			منطقة تبوك	4	القطاع الشمالي
			منطقة الحدود الشمالية	5	
			محافظة القريات	6	
			منطقة الجوف	7	القطاع الشرقي
			منطقة الشرقية	8	
			محافظة الاحساء	9	
			محافظة حفر الباطن	10	القطاع الغربي
			منطقة مكة المكرمة	11	
			منطقة المدينة المنورة	12	
			محافظة الطائف	13	
			محافظ القنفذة	14	
			محافظة جدة	15	القطاع الجنوبي
			منطقة الباحة	16	
			منطقة جازان	17	
			منطقة عسير	18	
			منطقة نجران	19	
			محافظة بيشة	20	



## Confidentiality undertaking

### تعهد

أتعهد أنا المشارك/ة في إجراء مقابلات مشروع كنز الرضاعة الطبيعية بما يلي :

- المحافظة على سرية المستندات للمعنيين في إجراءات المشروع فقط.
- المحافظة على سرية بيانات السيدات وحقوقهن في المشاركة.

الاسم : .....

التوقيع : .....

التاريخ : .....





## Data collection platform (Phase 1)

## أكسل بيانات التواصل مع المشاركين (الأسر) من العينة العشوائية


## البحث

F		كالتوج نشاطي		MOH Self-Services		أنعم	
استبيان							
الالتزام بروتوكول إصابات الضغط السري للتمريض		جودة الحياة الوظيفية		تقرير مبادرة صحة الفم و الأسنان		الرضا الوظيفي للممرضات	
مقياس بريستول للأنشطة اليومية		برامج التوعية الصحية المدرسية		Death Certificates Awareness		مؤشر بيئة العمل التمريضي	
Anticoagulation stewardship		إدارة الحالات المكتشفة في برامج الصحة المدرسية		حصص الأجهزة الطبية		مقياس كاتز للأنشطة الحياة اليومية الأساسية	
		مؤشرات الرضاعة الطبيعية		مراقبة انتظام الدوام		Parenteral nutrition at MOH hospitals	





## Training manual

Title of Training	Target group	Comments
WHO webinar Update on Infant & young child feeding Indicators 	<ul style="list-style-type: none"> <li>• Middle East team</li> <li>• Breastfeeding coordinators of all regions</li> <li>• The project coordinators of all regions</li> <li>• Staff of Nutrition Administration</li> <li>• Staff of General Statistics</li> </ul>	2- May-2023
Protocol of the project	The field coordinators	Several times in May 2023
How to conduct the interviews (2 hours online course)	The interviewers and the coordinators	Several times in May and June Certificates issued
Shahm training	The interviewers and the coordinators	Several times in May and June
KPI card	Staff of Nutrition administration	2 times in July 2023
	Presentation	August
Online workshop	Update on the first phase And research orientation	2 hours September
	The field coordinators meetings	October
	الاجتماعات مع وحدة المؤشرات الدولية	October
How to conduct the interviews (2 hours online course)	12 sessions	October + November



# Project poster

## ملصق الإعلانات



## Data collection mechanism

### آلية إجراء المقابلات لمشروع تقييم مؤشرات الرضاعة الطبيعية المحلية في المديرية

	اسم المنطقة أو المحافظة
	منسق مديرية الشؤون الصحية
	الإدارة التي يتبع لها منسق المديرية
	عدد المقابلات المخطط له
	الفترة الزمنية المخطط لها
	مكان إجراء المقابلات
	رقم الهاتف الذي سيرسل منه رسائل الإعلان (البوستر)
	ارقام الهواتف التي ستستخدم في المقابلات (خاصة بوزارة الصحة)
	شرح آلية تقديم المقابلات
	الآلية تقديم الشكر للمشاركين في المقابلات
	اعتماد صاحب الصلاحية - رئيس القسم

أسماء المشاركين في المقابلات		
رقم الجوال	ايميل وزارة الصحة	الاسم



## Appendix 18

### Crude associations between sample characteristics and each breastfeeding practice indicator, KSA

Sample characteristics	EvBF (N=9242)	EIBF (N=9242)	EBF2D (N=9242)	EBF (N=4026)	MixMF (N=4026)	CBF (N=3445)
Unadjusted OR (CI)						
Child's sex						
Boys	Reference	Reference	Reference	Reference	Reference	Reference
Girls	1.13 (0.99, 1.29)	<b>1.15 (1.06, 1.25)***</b>	1.03 (0.95, 1.13)	0.94 (0.79, 1.12)	0.92 (0.81, 1.04)	0.99 (0.84, 1.17)
Child's nationality						
Non-Saudi	Reference	Reference	Reference	Reference	Reference	Reference
Saudi	<b>0.66 (0.51, 0.84)***</b>	1.03 (0.90, 1.17)	0.87 (0.76, 1.00)	<b>0.42 (0.33, 0.52)***</b>	0.84 (0.69, 1.03)	<b>0.44 (0.34, 0.55)***</b>
Child's order in the family						
First-born child	Reference	Reference	Reference	Reference	Reference	Reference
Other	<b>1.49 (1.28, 1.74)***</b>	<b>1.16 (1.05, 1.28)**</b>	<b>1.32 (1.18, 1.48)***</b>	<b>1.39 (1.10, 1.75)**</b>	<b>1.36 (1.16, 1.60)***</b>	<b>1.26 (1.02, 1.57)*</b>
Mother's age						
Under 30 years	Reference	Reference	Reference	Reference	Reference	Reference
30 years or older	0.96 (0.83, 1.10)	<b>0.84 (0.77, 0.91)***</b>	0.94 (0.86, 1.03)	1.05 (0.87, 1.26)	<b>1.26 (1.10, 1.44)***</b>	1.07 (0.89, 1.28)
Mother's occupation status						
Housewife	Reference	Reference	Reference	Reference	Reference	Reference
Student/Working	1.15 (0.98, 1.35)	0.98 (0.89, 1.08)	0.96 (0.86, 1.06)	0.97 (0.79, 1.18)	1.11 (0.96, 1.28)	1.05 (0.86, 1.28)
Mother's education						
Diploma, university, or higher	Reference	Reference	Reference	Reference	Reference	Reference
High school or lower	0.96 (0.83, 1.10)	<b>1.16 (1.07, 1.27)***</b>	<b>1.18 (1.08, 1.30)***</b>	<b>0.67 (0.55, 0.82)***</b>	<b>1.22 (1.06, 1.40)**</b>	1.04 (0.88, 1.24)
Illiterate (cannot read or write)	1.12 (0.77, 1.62)	<b>1.29 (1.04, 1.60)*</b>	<b>1.32 (1.05, 1.65)*</b>	1.45 (0.95, 2.21)	1.33 (0.94, 1.88)	<b>1.85 (1.27, 2.70)***</b>
Sector related to place of delivery						

<i>Ministry of Health (MOH) facilities</i>	Reference	Reference	Reference	Reference	Reference	Reference
<i>Other governmental facilities</i>	<b>0.67 (0.57, 0.79)***</b>	<b>1.29 (1.16, 1.44)***</b>	1.04 (0.92, 1.16)	0.80 (0.62, 1.03)	1.01 (0.85, 1.20)	1.13 (0.90, 1.42)
<i>Private facilities</i>	0.91 (0.78, 1.07)	<b>0.90 (0.82, 0.99)*</b>	<b>0.81 (0.73, 0.90)***</b>	<b>1.33 (1.09, 1.62)**</b>	0.87 (0.75, 1.01)	<b>1.54 (1.28, 1.86)***</b>
Type of delivery						
<i>Vaginal delivery</i>	Reference	Reference	Reference	Reference	Reference	Reference
<i>Caesarean section</i>	<b>0.62 (0.54, 0.71)***</b>	<b>0.27 (0.24, 0.29)***</b>	<b>0.47 (0.43, 0.52)***</b>	<b>0.68 (0.56, 0.82)***</b>	0.93 (0.82, 1.06)	<b>0.80 (0.67, 0.95)*</b>
Gestational age at birth						
<i>Term</i>	Reference	Reference	Reference	Reference	Reference	Reference
<i>Premature</i>	<b>0.44 (0.37, 0.53)***</b>	<b>0.44 (0.38, 0.51)***</b>	<b>0.49 (0.41, 0.57)***</b>	<b>0.55 (0.39, 0.77)***</b>	<b>0.74 (0.60, 0.91)**</b>	<b>0.74 (0.55, 0.99)*</b>

OR = odds ratio, CI = confidence interval

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$

Abbreviations: CBF: Continued Breastfeeding; CI: confidence interval; EBF: Exclusive Breastfeeding Under Six Months; EBF2D: Exclusively Breastfed For The First 2 days After Birth; EIBF: Early Initiation of Breastfeeding; EvBF: Ever Breastfed; IYC: Infants and Young Children; MixMF: Mixed Milk Feeding under six months; MOH: Ministry of Health; OR: odds ratio.



## Appendix 19

Kingdom of Saudi Arabia Ministry of Health IRB GDRS	 وزارة الصحة Ministry of Health National Registration Number with NCBE-KACST, KSA: (H-01-R-009)	المملكة العربية السعودية وزارة الصحة اللجنة المحلية لأخلاقيات البحوث الإدارة العامة للبحوث والدراسات	
<b><u>Approval Letter</u></b>			
Date: 11\10\2023	Category of Approval: <b>Expedited</b>		
IRB log No: 23-85 M			
<i>Dear Dr. Fouzia Abdulaziz Alhreashy</i>			
The IRB pleased to inform you that your study mentioned below has been reviewed and approved. This letter gives you an ethical clearance to implement your study according to the approved documents and you still need to obtain administrative approval from the site/s where the study will be conducted.			
<b>Protocol Title</b>	Assessment of Breastfeeding Indicators in Saudi Arabia		
<b>PI name</b>	Fouzia Abdulaziz Alhreashy	<b>PI ID</b>	1018587905
<b>PI affiliation</b>	MOH	<b>PI E-mail</b>	<a href="mailto:fouziaalhreashy@yahoo.com">fouziaalhreashy@yahoo.com</a>
<b>IRB approved Documents (attached)</b>	<input checked="" type="checkbox"/> IRB application form <input type="checkbox"/> Data Collection tool	<input checked="" type="checkbox"/> Consent form <input checked="" type="checkbox"/> Others, CVs & ethics certificates	
<b>Co-investigators</b>	<b>Name</b>	<b>ID</b>	
	Ahmed H. Aljedai	1037001870	
	Lara Nasreddine	LR2146800	



## مهام الباحثين للنشر العلمي

### Authorship for research publication

نظرا لعدم أهلية من يقوم بجمع البيانات او من يقوم بمهمة ادارية محدودة في أن يكون كاتباً بحثياً بشروط أخلاقيات الأبحاث والمجلات العلمية المرموقة، فإن المشروع يفتح فرص اندراج جميع أعضاء الفريق المشارك فقط كباحث بشروط مشاركة بحثية فاعلة، وتشمل:

المهام البحثية	العلامة
تقييم الأداء للمشاركين في المشروع من لجنة مركزية والدعوة للمشاركة كباحث علمي حسب النتيجة	
الالتزام ببركتول المشروع والبحث العلمي.	
المشاركة طوال مدة المشروع والبحث بكفاءة عالية.	
جمع ما لا يقل عن 80% من قوائم الأسر الخاصة بالمنطقة باستمارات موافقة وارسالها في الوقت المحدد في شهم او ايميل الكنز المخصص. (خاص بمنسقي المديریات)	
ارسال جميع استبانات المشروع ونماذج التعهد في الجولتين مع نهاية المشروع بالبريد لمنسق المشروع (خاص بمنسقي المديریات)	
المشاركة في تنظيف البيانات لجميع المناطق (خاص بمنسقي المشروع)	
المشاركة في دعم المشروع الكلي لانجاحة مثل الدورة التدريبية واعداد النماذج الموحدة وأخذ عينات اضافية على المنطقة المخصصة والمقدرة على التعامل مع التحديات.	
توفر شهادة دورة أخلاقيات البحث العلمي.	
المشاركة البحثية حسب توزيع التكاليف والمهارات.	
المشاركة المالية في إجراءات البحث مثل متطلبات النشر في المجلات (إن احتاج الأمر).	
أخرى	



