



Accelerating the Scale up of early Childhood and Maternal Nutrition Interventions, Including CMAM, through Regional Platforms and Partnerships in the Middle East and North Africa

Landscape Analysis of Complementary Feeding in the Middle East and North Africa

# SYNTHESIS REPORT



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This work was commissioned by UNICEF Regional Office for the Middle East and North Africa under the leadership and guidance of the Senior Regional Nutrition Specialist, Vilma Qahoush Tyler, with support from UNICEF/HQ Colleagues, Nutrition Specialist Aashima Garg, Nutrition Specialists, Jessica White, and Kendra Siekmans. The work was commissioned to the following team:

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## Acronyms and Abbreviations

<b>BMS</b>	Breast-Milk Substitutes
<b>CF</b>	Complementary Feeding
<b>CVD</b>	Cardiovascular Disease
<b>CI</b>	Confidence Interval
<b>DHS</b>	Demographic and Health Survey
<b>ENN</b>	Emergency Nutrition Network
<b>IFPRI</b>	International Food Policy Research Institute
<b>IYCF</b>	Infant and Young Child Feeding
<b>ISN</b>	Implementation Science in Nutrition
<b>KAP</b>	Knowledge Attitude and Practice
<b>LBW</b>	Low Birth Weight
<b>LIC</b>	Low-Income Country
<b>LMIC</b>	Lower Middle-Income Country
<b>MAD</b>	Minimum Acceptable Diet
<b>MDD</b>	Minimum Diet Diversity
<b>MENA</b>	Middle East and North Africa
<b>MENARO</b>	Middle East and North Africa Regional Office
<b>MICS</b>	Multiple Indicator Cluster Survey
<b>MMF</b>	Minimum Meal Frequency
<b>MOH</b>	Ministry of Health
<b>NNS</b>	National Nutrition Survey
<b>OR</b>	Odds Ratio
<b>PHC</b>	Primary Health Center
<b>SoP</b>	State of Palestine
<b>SDG</b>	Sustainable Development Goals
<b>VASyr</b>	Vulnerability Assessment of Syrian Refugees
<b>WHO</b>	World Health Organization

## Executive summary

The period between conception and two years of age is considered a window of opportunity during which inappropriate feeding practices can affect the growth and nutrition of children with effects later during their lifetime. Ensuring complementary feeding (CF) practices meet recommended guidance between the age of 6 and 23 months is crucial in order to prevent malnutrition including stunting, wasting, and micronutrient deficiencies.

Nutrition indicators including those related to under and over-nutrition fall short from global targets in the Middle East and North Africa region which includes a variety of countries ranging in culture and political stability and witnessing a nutrition transition. There is a need to examine the status of complementary feeding practices in the region as well as their determinants in order to provide recommendations for improving dietary habits and nutritional status of children 6-23 months.

This landscape analysis aimed to conduct a situation analysis of the complementary feeding practices in the Middle East and North Africa region. The analysis included reviewing the situation related to nutrition and complementary feeding, identifying the enablers and hinderers of appropriate feeding, reviewing existing programs and policies, and providing recommendations for guiding the development of effective strategies and programs to improve complementary feeding.

The landscape analysis consisted of collecting information on six countries; Egypt, Jordan, Oman, State of Palestine, Lebanon, and Sudan including 1) conducting a literature review of both peer-reviewed and grey literature, 2) qualitative interviews with 37 key stakeholders including program implementers and end-users, 3) a brief quantitative survey questionnaire on programs, and 4) field observations. Qualitative and quantitative analyses as well as further analysis of household surveys were conducted.

Findings showed that despite improvement in some nutritional status indicators, there remains a considerable gap in progress. There is a need to implement high impact evidence-based interventions that would contribute to shifting the transition and improving nutrition. Complementary feeding habits show gaps. No in-depth analysis of complementary feeding have been conducted; and in many cases, there is a need to do more investigation on the feeding practices at the regional level. It was apparent that CF practices are suboptimal and differ noticeably between areas including amongst cultures.

The main determinants of CF emerging from this landscape analysis included factors 1) related to policies and social support systems, 2) at the community level, 3) at the health and nutrition service provision level, 4) at the household level, and 5) at the individual level. A cross cutting theme was maternal knowledge and attitudes which was seen to be affected by factors related to existing social support systems, available health and nutrition services, factors at the household level such as the influence of family members, and those at the individual level such as maternal education. These factors, in turn, were seen to affect maternal behavior and practices.

Interventions to improve complementary feeding practices should include actions at different levels; policy, service provision, household, and individual. Interventions should also address multiple systems including health and nutrition services, food and food security, social care, and hygiene and sanitation. Ensuring that interventions are tailored to the needs of populations even at the district level should be warranted in order to optimize impact and improve nutrition.





## 1. Introduction

The period between conception and a child's second birthday is considered a critical time for ensuring optimal growth and development in children with effects on health outcomes in later life (1,2). Appropriate feeding habits during this period are vital for short and long-term growth and health. The World Health Organization (WHO) and UNICEF recommend exclusive breastfeeding for the first six months of age, thereafter introducing adequate complementary food, and ensuring breastfeeding is continued up to the age of two and beyond (3). Failure to abide by these recommendations has been associated with health and nutritional inadequacies including both over and under nutrition (1).

In particular, the period between 6 and 24 months of age is one of the most critical periods for growth and if feeding practices, namely complementary feeding do not meet recommendations, the risk of malnutrition in all its forms as well as morbidity increases (5,6). Ensuring recommended complementary feeding practices requires that 1) food is introduced in a timely manner (i.e. starting at 6 months as per WHO recommendations, 2) food is adequate, meaning it provides sufficient energy, protein, and other essential micronutrients 3) food is safe, meaning it is hygienically stored and prepared and fed with clean hands and clean utensils, and 4) food is given responsively i.e. consistent with child's signals of hunger and satiety cues. Infants and young children at this age should also have appropriate food consistency and variety as well as frequency (7). Complementary feeding practices are usually assessed using the following feeding indicators: 1) Minimum meal frequency (MMF), 2) Minimum diet diversity (MDD), and 3) Minimum acceptable diet (MAD) (7). These indicators have been incorporated in household surveys such as the Multiple Indicator Cluster Survey (MICS) and Demographic Health Survey (DHS). Inappropriate quantities and quality of complementary food along with poor feeding practices and also increased infection during the period between 6 and 24 months are risk factors for stunting (8,9).

The Global Nutrition Report (10) shows considerable gaps between global targets and actual achievements in the nutritional status indicators amongst children of this age group. WHO's Member States have endorsed global targets for improving infant and young child nutrition by 2025 including a 40% reduction in the number of children who are stunted, no increase in childhood overweight, and reduction and maintenance of childhood wasting to less than 5% (10). Progress towards targets has been modest and insufficient around the globe. The report observed considerable variations in regions and highlighted the need to scale up efforts in order to "end malnutrition in all its forms by 2030" including stunting, wasting, and micronutrient deficiencies. Stunting in particular is critical given the high incidence during the first two years of life and its lifelong consequences (4). Infant and Young Child Feeding (IYCF) indicators have also been shown to be poor globally with approximately half of children not receiving a minimum meal frequency and less than a third receiving minimum diet diversity (receiving at least four food groups in the previous day) (11). Complementary feeding indicators have been shown to vary amongst and within households in different regions and from different social characteristics such as wealth, place of residence, and maternal education. There is therefore evidence of detrimental health implications of suboptimal feeding practices in all regions and improving IYCF practices is vital to contribute to improving nutritional status as well as responding to achieving the Sustainable Development Goals (SDGs) by 2030 in the region (Goals 1 & 3) (1).

Interventions to improve complementary feeding practices incorporate a range of activities including awareness, education and counselling on appropriate feeding practices, food supplementation and others including policy changes. These have been shown to have a significant impact on child growth in low and middle-income countries (1, 8, 66). Bhutta et al. (2013) showed that if interventions to improve complementary feeding practices were scaled up to nearly universal levels, approximately 100,000 under five deaths could be prevented each year (8). The Global Nutrition Report confirms that "we have never been better equipped to end malnutrition" and that we must act now (10).

The Middle East and North Africa (MENA) region includes low and middle-income countries with several countries facing humanitarian emergencies from natural and conflict-related disasters. The region, which includes countries that are extremely diverse in their culture and political stability, has witnessed significant social, economic, and political changes which have had an impact on the lifestyle and health of populations (13). Shifts in diets and lifestyles have led to a nutrition transition characterized by reliance on high-energy, nutrient-poor diets while at the same time there is a threat of food insecurity, undernutrition and micronutrient deficiencies. This transition differs between countries where the World Health Organisation has categorized countries in the region as: 1) countries in advanced nutrition transition stage (such as Oman); 2) countries in early nutrition transition stage (Egypt, Jordan, Lebanon, Palestine); 3) countries with significant undernutrition (Palestine); and 4) countries in complex emergency (Sudan) (14).

Amidst the different levels of nutrition transition, children remain the most vulnerable with a prevalent double burden of malnutrition (undernutrition; stunting, wasting, anemia and other micronutrient deficiencies, and over-nutrition: overweight and obesity). Similar to the situation at the global level, progress in nutrition indicators in this region has also been slow with inequities between and within countries. It is estimated that the regional average for stunting and wasting are 14.7% and 7.7% respectively whereas the regional average prevalence of overweight and obesity in children aged < 5 years is 11.2% (11). IYCF indicators have also shown little improvements where only 38% of children have adequate diet diversity and 21% only meet the minimum acceptable diet (11).

With the above in mind, and since adequate nutrition is a pre-requisite for health, it is important to examine in more depth the status of complementary feeding in the MENA region. It is also important to examine in more depth, the determinants that affect CF practices in order to identify appropriate measures for improving feeding practices and nutrition indicators. In 2018, and in order to address gaps in nutrition indicators as well as CF indicators, UNICEF MENA Regional Office (MENARO) prioritized support to countries in the region in accelerating interventions aimed at improving the diets of young children that will contribute to the MENARO Regional priority to reduce stunting. At the same time, UNICEF has recently launched a new framework for complementary feeding programming which aims at improving complementary feeding by adopting a systems approach (11). It is therefore important to examine the factors affecting complementary feeding practices such as those related to programs, policies, and others such as social determinants.

In order to capitalize on the above, UNICEF MENARO initiated a regional landscape analysis of trends and predictors of young children's diets in a select of six core countries in the region; Egypt, Jordan, Oman, State of Palestine (SoP), Lebanon, and Sudan as an initial step towards understanding the early child nutrition situation in the region. The analysis of the six countries is meant to provide an overview of the situation related to complementary feeding in the region in order to address gaps and guide future programming.



## 2. Aims and Objectives

The aim of this work was to conduct a situation analysis of complementary feeding in the Middle East and North Africa region in order to provide a basis for the development of the regional framework for planning, implementing and monitoring complementary feeding interventions.

The objectives are to:

- I. Review the **situation** and identify gaps related to complementary feeding practices including indicators of complementary feeding such as diet diversity and minimum meal frequency and other determinants in six selected countries (Egypt, Jordan, Oman, SoP, Lebanon, and Sudan).
- II. Identify the **enablers** and **hinders** of appropriate complementary feeding at the household level amongst children aged 6-24 months in the six selected countries.
- III. Review the existence and implementation of **policies, strategies, and programs** related to complementary feeding in the six selected countries.
- IV. Identify **barriers** and **successes** related to the implementation of complementary feeding programs in a subset of three countries (Oman, Egypt, and Sudan).
- V. Provide recommendations to guide the development of effective strategies and programmatic activities that optimize complementary feeding in the MENA region.





## 3. Methods

In order to achieve the above objectives, an exploratory approach was used in which information was collected from different sources and compiled to create a landscape view of the situation related to complementary feeding (CF) in Egypt, Jordan, Oman, SoP, Lebanon, and Sudan.

These specific countries were selected based on recommendations from UNICEF MENA regional office. They also differ in terms of geographic locations, income levels, and stage of the nutrition transition. For example, Sudan represents a Low-Income Country (LIC) and North African country as well as a complex emergency context. Oman is a high-income country (HIC) in advanced nutrition transition stage; Egypt, Jordan, Lebanon, and SoP are in the early nutrition transition stage, SoP is a country with significant undernutrition. In addition, considerations were given to whether useful data exists within the country such as in the case of SoP where data has been reported to exist.

The study used the following methods for data collection: 1) a literature review of both peer-reviewed and grey literature, 2) qualitative interviews with key stakeholders including program implementers and end-users, 3) a brief quantitative survey questionnaire on programs, and 4) field observations. Below is a description of the methods used.

### 3.1 Literature and Document Review

A document review was conducted to answer the following questions:

- What is the situation of complementary feeding in the six selected countries and what are the relevant trends?
- What are the factors affecting complementary feeding practices in the six selected countries?
- What are the existing policies, guidance, strategies, and other legal frameworks that guide complementary feeding in the six selected countries?
- Are these policies and legal frameworks adopted and implemented?
- What are barriers to implementation of policies and frameworks (if applicable)?

The document review consisted of three steps: a) request to country offices for sharing of documents, b) grey literature search, and c) peer reviewed literature search.

#### 3.1.1 Request to UNICEF country offices

A request was sent to UNICEF country offices to provide relevant documents including:

- a. National nutrition, health, or IYCF policies or other relevant policies if the latter do not exist including maternal and child health policies, baby friendly hospital policies and food security policies
- b. National nutrition, health, or IYCF strategic plans, work-plans or other strategic documents that may include actions related to CF. These may include food security plans or maternal and health plans.
- c. National protocols on nutrition, maternal and child health and nutrition, IYCF, or other related protocols such as micronutrient supplementation.
- d. Any reports of national nutrition and maternal and child health surveys for the past 10 years.
- e. Reports summarizing national nutrition, maternal and child health implemented programs, evaluations, or progress.
- f. Other documents that the UNICEF office may find relevant to this landscape analysis including unpublished barrier analyses as well as information about relevant nutrition sensitive interventions.

### 3.1.2 Grey literature review

In addition to the request to UNICEF offices, a grey literature review was conducted with the following search strategy:

Website / Database	Search terms
<b>Ministry of Health</b> (Oman OR Egypt OR Palestine OR Sudan OR Lebanon OR Jordan) (Filter by year: 2009 onwards)	<ul style="list-style-type: none"> <li>• Complementary feeding</li> <li>• Infant and young child feeding</li> <li>• Infant nutrition</li> <li>• Child nutrition</li> <li>• Breastfeeding</li> <li>• Nutrition AND (intervention OR program OR policy)</li> <li>• تغذية</li> <li>• تغذية الرضع و صغار الأطفال</li> <li>• الرضاعة</li> <li>• الأغذية المكملة/التغذية التكميلية</li> </ul>
<b>Global Nutrition Report</b> (Last published report 2018)	<ul style="list-style-type: none"> <li>• Oman</li> <li>• Egypt</li> <li>• Palestine</li> <li>• Sudan</li> <li>• Lebanon</li> <li>• Jordan</li> <li>• Global</li> </ul>
<b>Google</b> – (first 50 retrieved documents)	<ul style="list-style-type: none"> <li>• (Complementary feeding) AND (status OR intervention OR national OR program OR barriers OR challenges) AND (Oman OR Egypt OR Palestine OR Sudan OR Lebanon OR Jordan)</li> <li>• (Diet diversity OR minimum acceptable diet OR minimum meal frequency) AND Oman OR Egypt OR Palestine OR Sudan OR Lebanon OR Jordan</li> <li>• Nutrition survey AND (Oman OR Egypt OR Palestine OR Sudan OR Lebanon OR Jordan)</li> </ul>
<b>UNICEF</b> (Filter by year: 2009 onwards)	<ul style="list-style-type: none"> <li>• Complementary feeding AND (Oman OR Egypt OR Palestine OR Sudan OR Lebanon OR Jordan OR MENA OR Global)</li> <li>• (Diet diversity OR minimum acceptable diet OR minimum meal frequency) AND (Oman OR Egypt OR Palestine OR Sudan OR Lebanon OR Jordan OR MENA OR Global)</li> <li>• Infant and Young Child Feeding AND (Oman OR Egypt OR Palestine OR Sudan OR Lebanon OR Jordan OR MENA OR Global)</li> <li>• Malnutrition AND (Oman OR Egypt OR Palestine OR Sudan OR Lebanon OR Jordan OR MENA OR Global)</li> <li>• Nutrition Country Profiles AND (Oman OR Egypt OR Palestine OR Sudan OR Lebanon OR Jordan)</li> </ul>
<b>WHO</b> (Filter by year: 2009 onwards)	<ul style="list-style-type: none"> <li>• Complementary feeding AND (Oman OR Egypt OR Palestine OR Sudan OR Lebanon OR Jordan OR EMRO OR Global)</li> <li>• (Diet diversity OR minimum acceptable diet OR minimum meal frequency) AND (Oman OR Egypt OR Palestine OR Sudan OR Lebanon OR Jordan OR EMRO OR Global)</li> <li>• Infant and Young Child Feeding AND (Oman OR Egypt OR Palestine OR Sudan OR Lebanon OR Jordan OR EMRO OR Global)</li> <li>• Infant and Young Child Nutrition AND (Oman OR Egypt OR Palestine OR Sudan OR Lebanon OR Jordan OR EMRO OR Global)</li> <li>• Nutrition Policy AND (Oman OR Egypt OR Palestine OR Sudan OR Lebanon OR Jordan)</li> <li>• (Nutrition Action OR Nutrition Intervention OR Nutrition Programme) AND (Oman OR Egypt OR Palestine OR Sudan OR Lebanon OR Jordan)</li> </ul>



Website / Database	Search terms
<b>DHS</b> (Oman OR Egypt OR Palestine OR Sudan OR Lebanon OR Jordan) https://dhsprogram.com (Filter by year: 2009 onwards)	<ul style="list-style-type: none"> <li>• Complementary feeding</li> <li>• Diet diversity</li> <li>• Minimum acceptable diet</li> <li>• Minimum meal frequency</li> <li>• Solid, semi-solid, or soft food</li> <li>• Breastfeeding (exclusive, predominant, continued, ever-breastfed...)</li> <li>• Nutritional status</li> <li>• Anemia</li> <li>• Salt iodization</li> <li>• Micronutrient supplementation</li> </ul>
<b>MICS</b> (Oman OR Egypt OR Palestine OR Sudan OR Lebanon OR Jordan) (Filter by year: 2009 onwards)	<ul style="list-style-type: none"> <li>• Complementary feeding</li> <li>• Diet diversity</li> <li>• Minimum acceptable diet</li> <li>• Minimum meal frequency</li> <li>• Solid, semi-solid, or soft food</li> <li>• Breastfeeding (exclusive, predominant, continued, ever-breastfed...)</li> <li>• Nutritional status</li> <li>• Anemia</li> <li>• Salt iodization</li> <li>• Micronutrient supplementation</li> </ul>
<b>UNHCR</b> (Filter by year: 2009 onwards)	<ul style="list-style-type: none"> <li>• Vulnerability Assessment of Syrian Refugees in Lebanon</li> </ul>
<b>Emergency Nutrition Network (ENN)</b> (Filter by year: 2009 onwards)	<ul style="list-style-type: none"> <li>• Food security AND (Oman OR Egypt OR Palestine OR Sudan OR Lebanon OR Jordan)</li> <li>• (Complementary feeding) AND (status OR intervention OR national OR program OR intervention OR policy OR barriers OR challenges) AND (Oman OR Egypt OR Palestine OR Sudan OR Lebanon OR Jordan)</li> <li>• (Diet diversity OR minimum acceptable diet OR minimum meal frequency) AND (Oman OR Egypt OR Palestine OR Sudan OR Lebanon OR Jordan)</li> <li>• Breastfeeding AND (Oman OR Egypt OR Palestine OR Sudan OR Lebanon OR Jordan)</li> <li>• Malnutrition AND (Oman OR Egypt OR Palestine OR Sudan OR Lebanon OR Jordan)</li> <li>• Infant and Young Child Feeding AND (Oman OR Egypt OR Palestine OR Sudan OR Lebanon OR Jordan)</li> <li>• Infant and Young Child Nutrition AND (Oman OR Egypt OR Palestine OR Sudan OR Lebanon OR Jordan)</li> <li>• Nutrition AND (intervention OR program OR policy)</li> </ul>

Furthermore, the websites and databases were browsed for any information relevant to the topic of interest. Given that Arabic is the official language in the countries reviewed, Arabic terms corresponding to infant and child nutrition and complementary feeding were added to the search of the Ministries of Health's websites.

Documents and information retrieved from the grey literature review were screened for relevance. Pertinent information was extracted relating to the selected countries' nutrition profiles, and additional data on global and regional values was added for comparison. Further information extracted included national policies, strategies, and guidelines, as well as programs and interventions related to maternal, infant and young child feeding, and nutrition and food security. It is worth noting that additional relevant documents were retrieved after referrals from interviewees during the meetings and key informant interviews.

### 3.1.3 Review of peer reviewed literature

A review of the peer-reviewed literature was conducted using the following search strategy:

Databases	Key word search
<b>Pubmed</b> (https://www.ncbi.nlm.nih.gov/pubmed/)	[Egypt OR Jordan OR Lebanon OR Palestine OR Oman OR Sudan]
<b>Medline</b> Articles dated 2009 onward	AND [Complementary feeding OR weaning food OR solid food OR Infant nutrition OR Infant and young child feeding OR (Nutritional status AND Child) OR Diet diversity OR Minimum meal frequency OR Minimum acceptable diet]

Retrieved articles were abstract scanned for relevance and possibly relevant documents were kept for full-text review and data extraction (see below).

Appendix A is a listing of all retrieved documents and their details.

### 3.1.4 Data extraction

Data extraction sheets were used to retrieve information from selected and relevant documents. First, relevant retrieved documents were tabulated (Appendix A). Findings from documents were then extracted to feed into four main sections in line with the assignment's objectives.

#### *Section 1: Country profile*

The sheet includes information related to complementary feeding and nutrition indicators relevant to each of the selected countries. Indicators included nutritional status (wasting, stunting, etc.) as well as complementary feeding indicators (diet diversity, minimum meal frequency etc.). Appendix B includes the country profile sheet and the entry points.

The following are the definitions for the CF indicators as defined by the World Health Organization (7).

Indicator	Definition	Calculation
<b>Introduction of solid, semi solid or soft foods:</b>	Proportion of infants 6–8 months of age who receive solid, semi solid or soft foods	Infants 6–8 months of age who received solid, semi-solid or soft foods during the previous day / infants 6–8 months of age
<b>Minimum diet diversity</b>	Proportion of children 6–23 months of age who receive foods from 4 or more food groups	Children 6–23 months of age who received foods from 4 food groups during the previous day / Children 6–23 months of age The 7 foods groups are: grains, roots and tubers; □ legumes and nuts; dairy products (milk, yogurt, cheese); □ fresh foods (meat, fish, poultry and liver/organ meats); eggs; vitamin-A rich fruits and vegetables; and other fruits and vegetables.
<b>Minimum meal frequency</b>	Proportion of breastfed and non-breastfed children 6–23 months of age who receive solid, semi-solid, or soft foods (but also including milk feeds for non-breastfed children) the minimum number of times or more.	The indicator is calculated from the following two fractions: Breastfed children 6–23 months of age □ who received solid, semi-solid or soft foods the minimum number of times or more during the previous day / Breastfed children 6–23 months of age and non-breastfed children 6–23 months of age □ who received solid, semi-solid or soft foods or milk feeds the minimum number of times or more during the previous day / non-breastfed children 6–23 months of age  Minimum meal frequency is defined as: – 2 times for breastfed infants 6-8 months □ – 3 times for breastfed children 9-23 months □ – 4 times for non-breastfed children 6-23 months  “Meals” include both meals and snacks (other than trivial amounts, and frequency is based on caregiver report. □
<b>Minimum acceptable diet:</b>	Proportion of children 6–23 months of age who receive a minimum acceptable diet (apart from breast milk).	This composite indicator is calculated from the following two fractions: Breastfed children 6–23 months of age who had at least the minimum diet diversity and the minimum meal frequency during the previous day / Breastfed children 6–23 months of age and non-breastfed children 6–23 months of age who received at least 2 milk feedings and had at least the minimum diet diversity not including milk feeds and the minimum meal frequency during the previous day / non-breastfed children 6–23 months of age

### Section 2: Policy environment

Information about existing policies, guidance, protocols, and other legal frameworks were extracted for each of the selected countries. These can be related to complementary feeding including IYCF, food security, maternal and child health and nutrition and micronutrient supplementation. Relevant information related to gaps and barriers to implementation of policies were extracted. Information retrieved is based on indicators from the World Breastfeeding Trends Initiative assessment tool (15) as well as the WHO tool for assessing policies (16). Appendix C includes the policy environment data extraction sheet and the different entry points used.

### Section 3: Intervention programs

The section includes a compilation of information related to programs and initiatives on complementary feeding. These may include child nutrition interventions, IYCF, micronutrient supplementation, and others. Information collected includes programs objectives, outcomes, and progress as well as coverage and results from evaluations if relevant. Information about intervention programs was complemented with details about educational material and mapped against the Guiding Principles on CF (17).

### Section 4: Barriers and factors affecting complementary feeding

Reported barriers and factors affecting complementary feeding were extracted.

**Table 1 - Summary of data sources per country**

Country	Peer reviewed article	National surveys	Reports	Other articles	Program questionnaire
<b>Egypt</b>	38 retrieved 15 used	2	7		1
<b>Jordan</b>	15 retrieved 7 used	3	-	6	-
<b>Lebanon</b>	11 retrieved 5 used	1 (5 for refugees)	1	8	2
<b>Oman</b>	6 retrieved 1 used	3	4	-	
<b>Sudan</b>	10 retrieved 2 used	2	1	-	3
<b>SoP</b>	14 retrieved 13 used	2	2	-	2

## 3.2 Key informant interviews and meetings

Interviews with key stakeholders including UNICEF country office nutrition specialists were conducted in order to get information on:

- What is the overall status of complementary feeding practices in the country? What are common complementary feeding practices? What are the main factors affecting practices?
- What are existing policies, legal frameworks, and guidance related to nutrition of infants and young children 6-24 months of age? Are these policies implemented? What are the barriers for implementation?
- What are the main interventions and initiatives currently being conducted to support feeding of infants and young children 6-24 months? Who are the main implementers supporting these initiatives?
- What are the main challenges in supporting complementary feeding practices in the country?
- What are your recommendations for supporting complementary feeding in the country?

A topic guide (Appendix D) was devised based on the literature review as well as the above questions and was adjusted to the role and position of interviewees. Interviews were conducted either face to face or remotely with individuals or with groups of individuals. Key stakeholders were identified in each country including key actors in IYCF.

Selection of key stakeholders was done in a convenient and participatory manner with UNICEF country office and based on the literature review. Given the short period of the assignment, three to five key stakeholders were identified and interviewed per selected country. A participant information sheet and consent form were shared with the key informants prior to the interviews (Appendix E). Stakeholders needed to meet the following criteria:



- Be engaged in IYCF programming in the country for a considerable time.
- Have experience in IYCF and be considered a key actor by UNICEF and the government.
- Be able and available to participate in the study.

A total of 27 interviews were conducted with 37 key informants (Table 2).

Table 2 - Number of interviews conducted

Country	Number of individuals interviewed	Number of interviews conducted
Egypt	5	5
Oman	7	4
SoP	3	3
Sudan	10	9
Lebanon	8	3
Jordan	4	3
<b>Total</b>	<b>37</b>	<b>27</b>

### 3.3 Survey questionnaire

In order to capture the range of interventions related to IYCF and specifically complementary feeding, a survey questionnaire was developed targeting implementing agencies and ministries of public health. The survey collected information about the nature of interventions being administered, their scope, objectives, and main challenges in implementation. A request was sent to member organizations of the nutrition cluster or working group (Appendix F includes the request and participant information sheet). In Oman, given the nature of the centralized interventions, the questionnaire was administered face-to-face with the ministry of health.

Despite several reminders, a very low response rate was observed for the questionnaire with only 12 responses received, 3 of which were incomplete. Appendix G includes the main information collected from the organizations.

### 3.4 Field observations

For the three selected countries (Egypt, Oman, and Sudan), a visit to the country was conducted. For Oman and Sudan, a field trip was conducted to a facility implementing a program related to complementary feeding, while it was not possible in Egypt as no security clearance was granted from MoH. During the visit, observations were made related to the nature of the intervention and interaction with beneficiaries. Notes were taken on gaps or successes identified. Although not representative, this field trip was meant to get a feel for the nature of interventions as well as the culture of the communities where the programs are implemented.

### 3.5 Analysis

#### a. Analysis for six countries

As mentioned above, the approach adopted is exploratory in which themes and concepts emerge, as the data is analyzed. The analysis also relied on theoretical models to synthesize collected information.

Below is a description of the analysis method for each of the data collected and the relevant framework used:

For the document review, and as described above, data extraction was conducted using the devised data extraction sheets (please see section 3.1 above).

For the synthesis of information related to programs in the six countries (both from the document review and the questionnaire), the guidance on complementary feeding (17) was used where ten guidance summarize the components of complementary feeding interventions. Program components / educational material and activities were categorized as either meeting the guidance, partially meeting, or not at all.

For the analysis of the qualitative data from interviews and meetings as well as observations, thematic analysis was adopted which consisted of: a) familiarization with the information collected, b) data coding and indexing of information, c), grouping and categorizing by themes, d) labelling, and e) writing of the results.

## b. Preliminary analysis of household surveys

For Sudan, Egypt, Jordan, and SoP, for which datasets were available, preliminary analysis was conducted for the latest household surveys. Binary logistic regression analysis was run to identify associations between the dependent (minimum diet diversity score, minimum meal frequency and minimum acceptable diet) and independent variables. The analysis was binary and did not adjust for any potential confounding variables due to shortage in time. However, further analysis could be conducted in the future to account for confounding variables such as wealth and education.

The dependent variable:

- For 'minimum diet diversity score' was coded as '1' for those who had consumed four or more foods and '0' for less than four food groups during the previous day.
- For MMF was coded as '1' for those who had consumed the MFF and 0 for those who have not
- For MAD was coded as '1' for those who had consumed the MAD and 0 for those who have not

The level of significance was determined at P-value of less than 0.05 with a 95% confidence interval.

## c. Further analysis for three countries

This assignment included a more in-depth analysis of barriers and facilitators of programs in three selected countries (Oman, Egypt, and Sudan). For this analysis, a **theory of change** was devised which attempted to identify gaps and factors leading to these gaps in programming.

## 3.6 Ethical Considerations

In order to ensure that this assignment and the research conducted has minimal harm on participants, a number of ethical considerations were taken throughout based on the principles of autonomy, confidentiality, anonymity and non-maleficence or do no harm (18). These considerations were also taken in order to mitigate any risk that may jeopardize the security of participants.

### 3.6.1 Scientific validity and social value

One main ethical consideration is the scientific validity and the social value of this research. The research adopted a robust methodology in order to ensure quality of the research. The review of literature was conducted in a structured manner as described in section I above. Also, participants were chosen using a clear methodology. The nature of the research will bring added value to the field of child nutrition, specifically complementary feeding. The study aims at providing an analysis of the situation related to complementary feeding in the MENA region which will contribute to the development of recommendations for improving complementary feeding practices and therefore improved child nutritional status and health.

### 3.6.2 Confidentiality and anonymity

In order to ensure confidentiality and ethical right, individuals were not personally identifiable from the data collected. All data is password protected on a computer which is only used by the team working on this assignment. Participants were identified by codes and not by their names. Participants were informed that the data will solely be used for the research/assignment and that information collected from participants will remain confidential. All recordings were stored in a password-protected computer. Information is only used by the research team.

### 3.6.3 Autonomy

In order to ensure individual autonomy, participation was on voluntary basis. Prior to the interview or administration of the survey, participants were provided with a description of the assignment including the objectives and expectations in the form of a participant information sheet. The sheet explained that participation is voluntary and that participants have the right to withdraw at any time if they choose to without any negative repercussions. Participants were informed that they can choose not to answer some questions if they prefer. They were informed that participation in this study does not involve any physical risk, emotional risk, or security risk beyond the risk of daily life. They will receive no direct benefits from participating in this research, however their contribution will help this research shed light on complementary feeding in the MENA region and therefore to improving nutrition for infants and young children.

Consent was provided depending on the modality of the participation:

- For interviews conducted remotely (via Skype or phone), participants were asked to provide oral consent.
- For interviews conducted face-to-face, participants were asked to sign a consent form (Appendix E) confirming their participation and their understanding of their rights to withdraw at any time without any consequences.
- For the survey questionnaire, the information sheet (Appendix F) specified that proceeding with filling the questionnaire means that the participant has consented to participating in this assignment/research.

The study did not include interviews with vulnerable groups such as mothers or children. However, it included observations in health facilities where mothers were either receiving education and counselling or children were provided with treatment for malnutrition (such as the case of Sudan). For that, the participant information sheet was filled by the person in charge of the health facility consenting to providing the space to conduct the observation.

### 3.6.4 Do no harm

During interviews and meetings, all participants were treated with respect. They were not coerced or led to say anything. The interviewer did not agree nor disagree with what the participants are saying but facilitated the discussion so participants could express their views. Participants were given full freedom to express their opinions and participation in the study did not expose them to statutory or political retaliation.

### 3.6.5 Other considerations

In order to ensure trustworthiness and rigor, a number of strategies were adopted including:

- Documenting procedures and the methodology adopted throughout the different steps especially if this is to be replicated. This was achieved by keeping records of key thoughts and learnings.
- During the analysis phase, a second team member verified the coding to ensure validity of the analysis.
- Clarifying and stating any bias that may occur during the study using the concept of reflexivity (19).

## 3.7 Limitations

A number of limitations need to be taken into consideration in this work:

- Inability to conduct a field trip to health care facilities in Egypt rendered it difficult to get a feel of the services provided. The team had to rely on key informants' perceptions related to service provision.
- The security situation in Sudan and SoP affected the availability of interviewees and their mobility as well as the mobility of the interviewer (in Sudan).
- The low response rate in the survey questionnaire contributed to gaps in data related to programs. It was not possible to have a clear mapping of the programs and interventions happening in the relevant countries.
- The limited time of the assignment hindered a more in-depth and thorough analysis of household surveys. Only a binary logistics regression was conducted to identify associations however a more in-depth analysis would have even given more insight onto the determinants of CF.



## 4. Synthesis of Findings

A synthesis of the findings from the landscape analysis for the six countries is presented below.

### 4.1 Country Profiles

Country profiles were outlined for each of the six countries reporting on the relevant **nutritional status and feeding indicators**. Household surveys were retrieved including the Multiple Indicator Cluster Survey (MICS), Demographic Household Survey (DHS), and National Nutrition Survey (NNS) (Table 3). Where available, data was complemented with individual studies as well as information emerging from qualitative interviews. Appendix B is a compilation of data from relevant household surveys since 2009.

**Table 3 - Data sources (household surveys) for each country**

Country	Wealth quintile	Household Survey / Data Source
Egypt	Lower MIC	DHS (2008), DHS (2014)
Jordan	Upper MIC	DHS (2008), DHS (2012), DHS (2017-2018)
Lebanon	Upper MIC	MICS (2009)
Oman	HIC	NNS (2009), MICS (2014), NNS (2017)
SoP	Lower MIC	MICS (2010), MICS (2014)
Sudan	Lower MIC	S3M (2013), MICS (2014)

#### 4.1.1 Nutritional Status

Countries differ in rates of nutritional status for children under 5 with both over and under nutrition prevalent and indicators falling behind global and regional targets (Figure 1).

Prevalence of Low Birth Weight (LBW) ranged from a lowest in SoP (8.3%) (20) to a highest in Sudan (32.3%) (21) (Figure 1). Trend over time was only possible for Oman, SoP, Jordan and Lebanon showing a slight increase in Jordan and Lebanon (Figure 2). The slight increase in Jordan may be explained by the inclusion of Syrian populations in current DHS. Recently, Blencowe et al. (2019) reported that there is a slight decrease in prevalence of LBW in North Africa and West Asia between 2000 and 2015 (67).

**Table 4 - New prevalence thresholds for wasting, stunting and overweight (22)**

Prevalence thresholds, corresponding labels and number of countries in different prevalence threshold categories for wasting, overweight and stunting in children under 5 years using the 'novel approach'

Wasting*			Overweight*			Stunting*		
Prevalence thresholds (%)	Labels	No. of countries	Prevalence thresholds (%)	Labels	No. of countries	Prevalence thresholds (%)	Labels	No. of countries
< 2.5	Very low	36	< 2.5	Very low	18	< 2.5	Very low	4
2.5-< 5	low	33	2.5-< 5	low	33	2.5-< 10	low	26
5-< 10	Medium	39	5	Medium	50	10-< 20	Medium	30
10-< 15	High	14	5-< 10	High	18	20-< 30	High	30
≥ 15	Very high	10	10-< 15	Very high	9	≥ 30%	Very high	44
			≥ 15	high				

De Onis et al., 2018. Prevalence thresholds for wasting, overweight and stunting in children under 5 years.

The highest prevalence of wasting is in Sudan (16.3%) followed by Oman (9.3%), and Egypt (8%), thus reaching levels of critical public health significance (Table 4). Rates in SoP (1.2%) and Jordan (2.4%) were acceptable. While wasting seems to level off or decrease in Sudan and SoP, it is increasing in Oman and Jordan (Figure 4). At the same time, unpublished reports from Sudan show that in fact wasting may have increased.

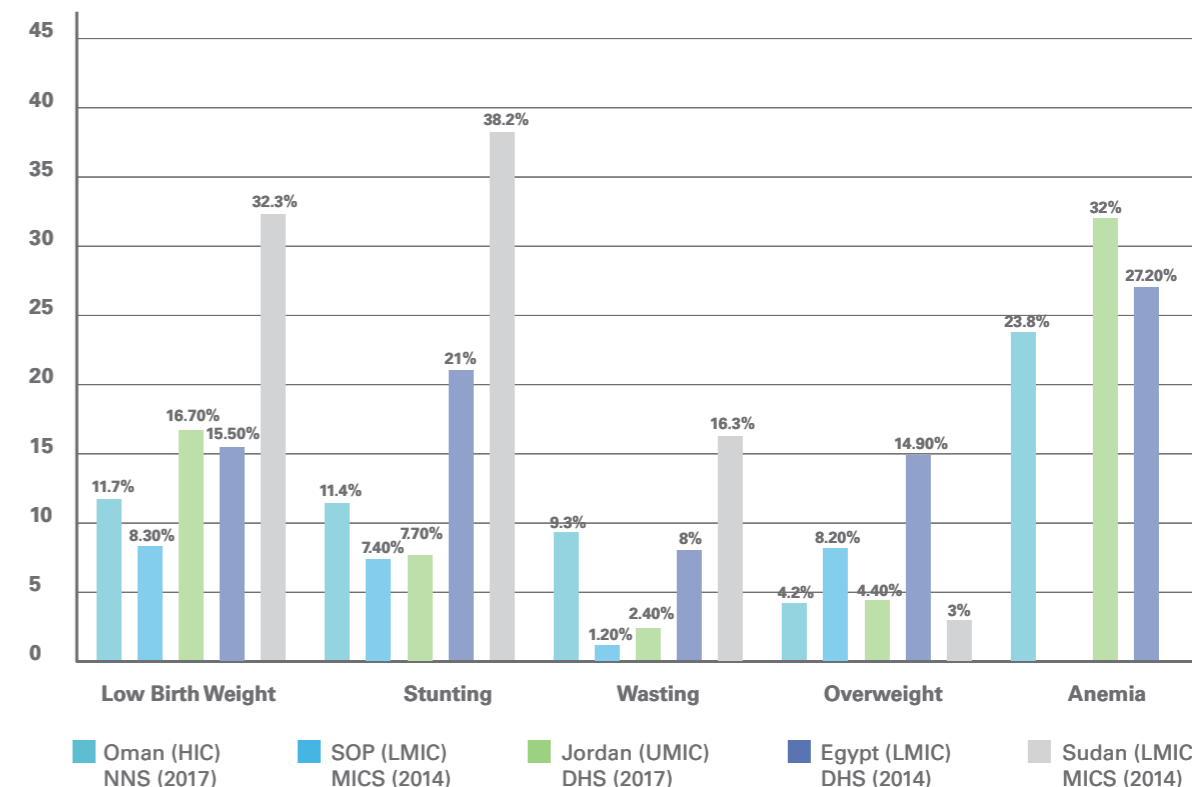
Prevalence of stunting was highest in Sudan (38.2%) and has been on the increase (3%) as it continues to experience political unrest. Rates in Egypt are at 21%, Oman at 11.4%; and lowest in SoP (7.4%) and Jordan (7.7%) (Figure 1). No recent estimates from household surveys could be retrieved for Lebanon while the other countries are showing a slight decrease (Figure 3).

Prevalence of acute and chronic malnutrition as well as micronutrient deficiencies in SoP has also been confirmed in individualized studies (23,24,25,26).

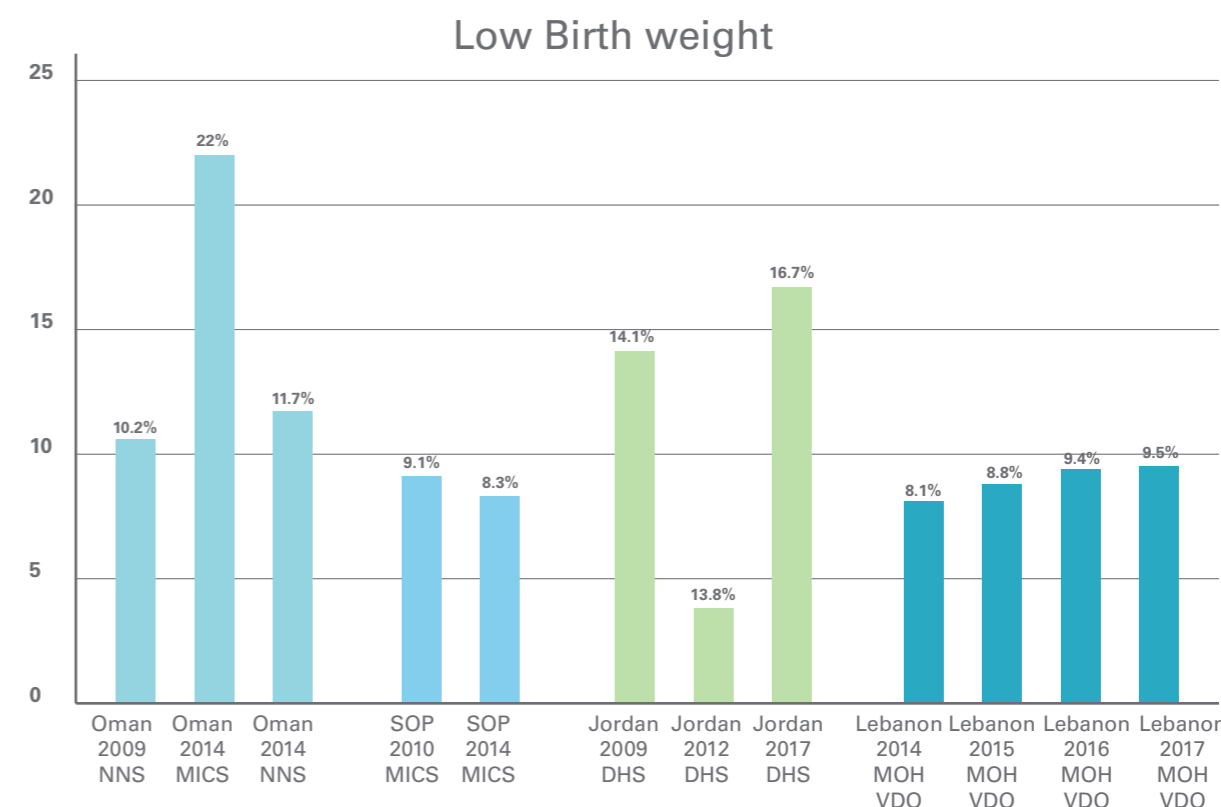
While acute malnutrition and stunting are present in most six countries, a rise in childhood overweight is seen in a number of those countries in the region including in Egypt (currently at 14.9%) and SoP (8.2%) revealing a nutrition transition and the double burden of malnutrition. Prevalence of childhood overweight seems to be increasing in SoP (~3%). Prevalence of child overweight in Sudan is low although a trend of increase is starting to show (Figure 5). Reports have also highlighted the rising prevalence of obesity and chronic diseases amongst adult populations in the region. This is evident from the regional rates of adult mortality due to cardiovascular disease (CVD) (31.9%) (40% in Egypt, 36.7% in Jordan, 46.7% in Lebanon, 28.5% in Sudan, and 36% in Oman) (27).

The double burden of malnutrition has been reported to occur both within countries as well as inside households. In Egypt, prevalence of households where a child is stunted and the mother is overweight has been reported to exceed 10% and this has been linked to low diet diversity and increased consumption of sugary snacks (28). Also, El Kishawi et al. (2016) reported on the double burden of malnutrition in the Gaza Strip within the same household and found that 15.7% of households included an overweight mother and an underweight child (29). Its associated factors were child's birth order, father's education, high scores of mothers' nutrition knowledge, and low monthly income. Recently, Nassreddine et al. (2018) conducted a situation analysis of the nutritional situation in the MENA region and highlighted the double burden of malnutrition and the prevalence of both over nutrition (overweight) and under-nutrition (stunting) in the region thus confirming the situation (31).

Key informants confirmed the presence of a double burden of malnutrition including wasting, stunting, micronutrient deficiencies and obesity in most of the countries. This double burden was perceived to be seen at both the household and individual level in all countries with the exception of Sudan where acute malnutrition, micronutrient deficiencies, and stunting were the conditions mostly reported.



**Figure 1 - Nutritional status indicators based on household surveys (amongst children 6-59 months)**



**Figure 2 - Prevalence and trends in Low Birth Weight**



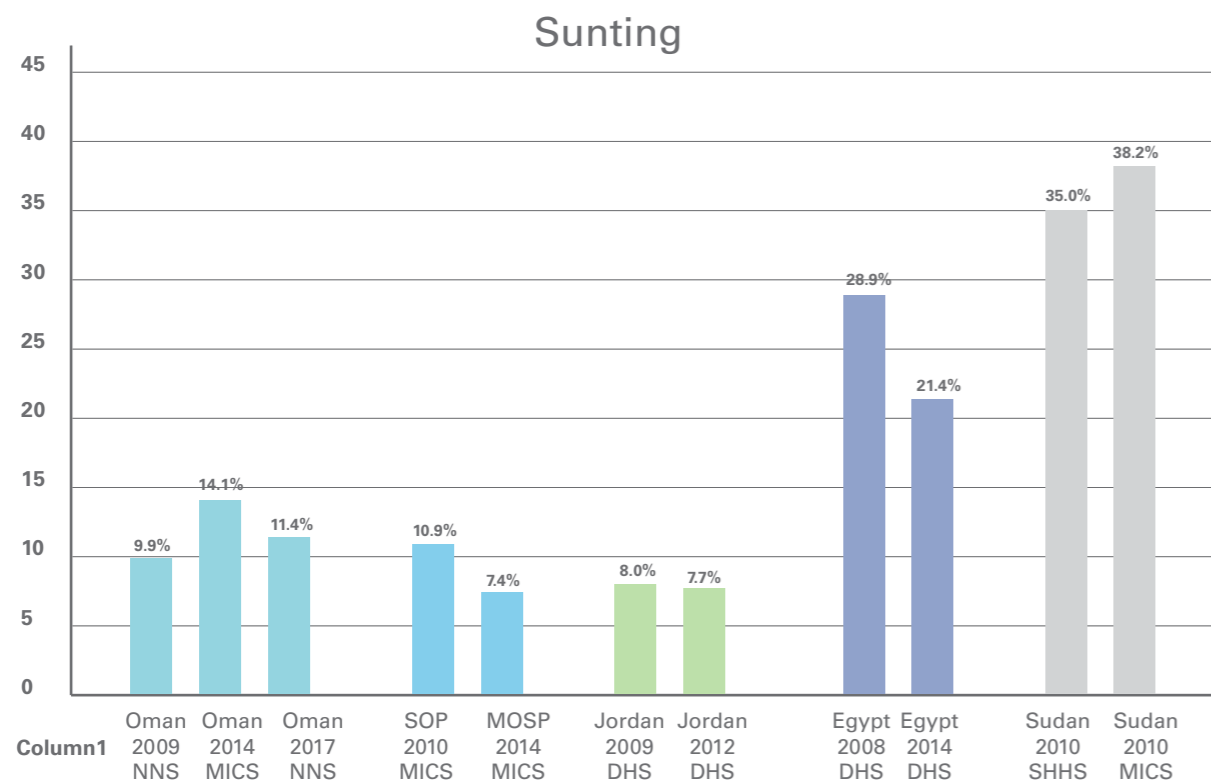


Figure 3 - Prevalence and trends in Stunting (amongst children 6-59 months)

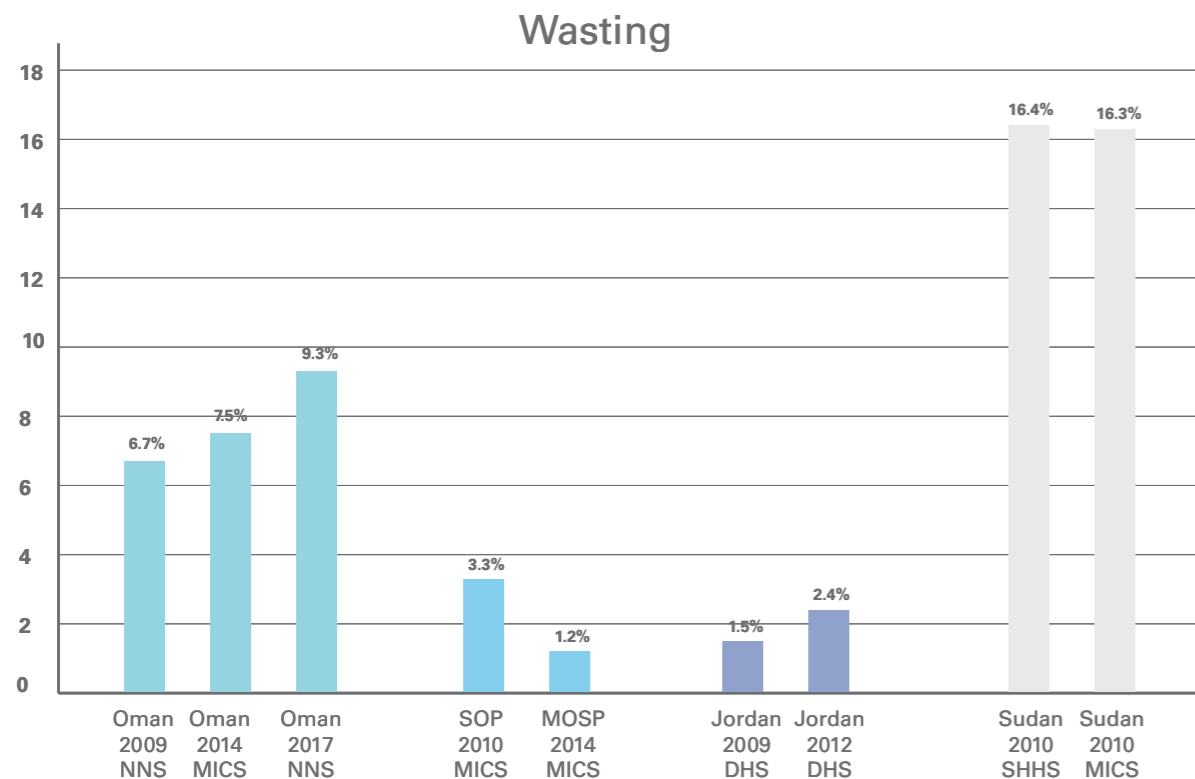


Figure 4 - Prevalence and trend in Wasting (amongst children 6-59 months)

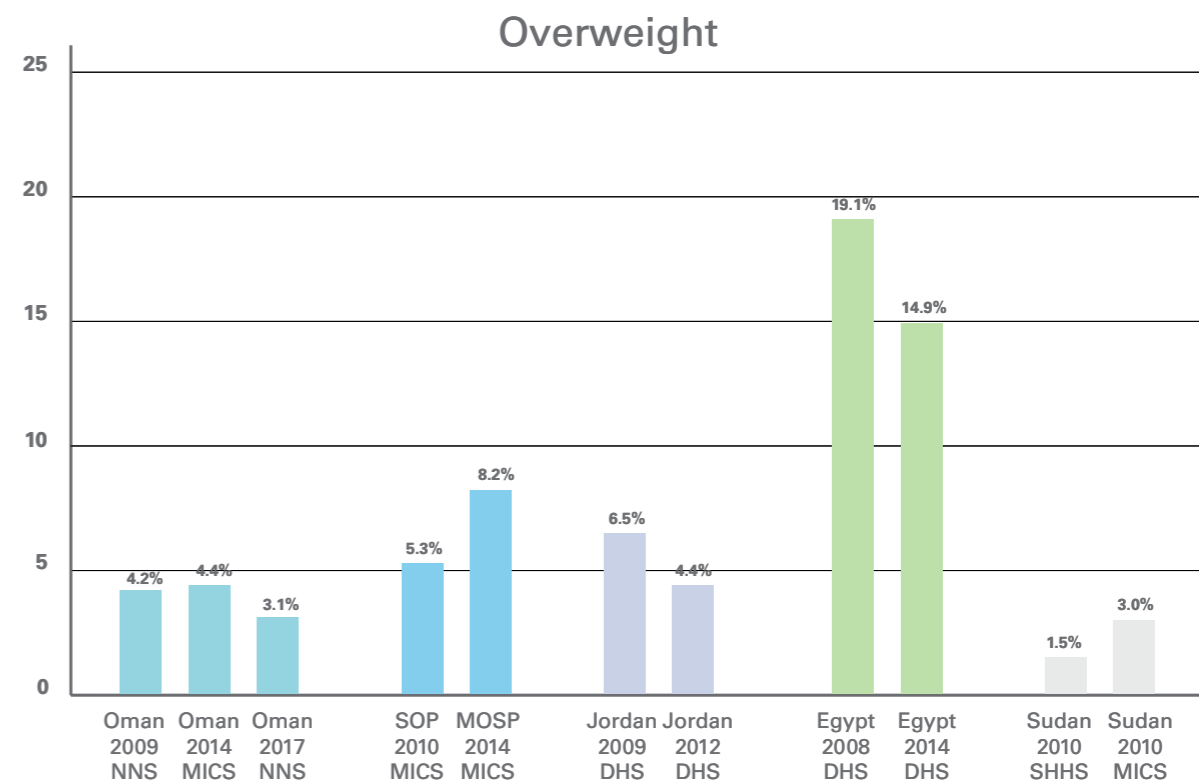


Figure 5 - Prevalence and trend in Overweight (amongst children 6-59 months)

In addition to wasting, stunting, and overweight, iron deficiency anemia remains one of the most prominent nutritional disorders amongst children (and women) in the MENA region. Despite a slight decrease in some countries, rates continue to remain high. Prevalence of anemia is apparent in all of the six countries where data exists with a high of 32% in Jordan, 27.2% in Egypt, and 23.8% in Oman amongst children 6-59 months (Figure 1). No data was reported for Lebanon. Trend over time was only possible for Jordan showing a slight decrease and then stagnation (Figure 6); and a decrease was also reported in Oman (31).

In SoP, one in four boys and one in five girls are considered anemic (32). In Lebanon, Salami et al. (2018) recently showed that in a sample of hospitalized children in the South of Lebanon, the prevalence of both mild and moderate anemia was at 71.8% and 25.4% respectively with a clear link to malnutrition amongst children (33). In a review of nutritional status indicators in the MENA region, Nassreddine et al. (2018) reported that anemia prevalence in children under 5 is 28.3% based on a 1998 household survey (34, 35).

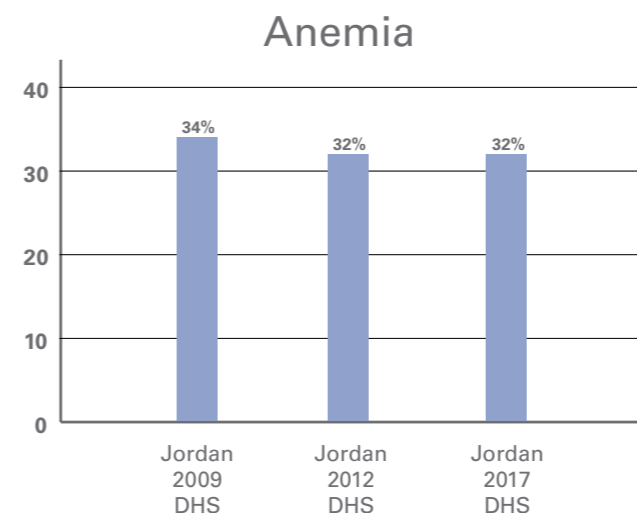


Figure 6 - Prevalence and trend in Anemia in Jordan



Regional disparities have been reported within countries. Al Ghwass et al (2015) reported that in one governorate in Egypt (Al-Fayom) the rate of Iron Deficiency Anemia was 64% amongst children 6 months to 12 years and 39% in infants and young children under 2 years of age compared with national figure for under 2 (36). Although this was a hospital-based study, it is an indication about the severity of the situation in that area. The Palestine Micronutrient Survey showed that anemia was markedly more prevalent in the Gaza Strip with 19% of children 6 to 59 months having depleted iron stores vs 13.7% in the West Bank (32). These regional disparities have been confirmed by the key informant interviews where participants highlighted the difference between regions and population groups and importance of tailoring strategies to address these disparities. Examples of nomad populations as well as urban vs rural were given. Further elaboration on this disparity was given in the discussion around eating habits (see section 4.1.2 below).

Anemia has been linked to a number of factors, including maternal iron deficiency (37), consuming cow's milk during the first 6 months or delayed introduction of solid foods after 6 months (38).

Other micronutrient deficiencies that have been reported include Vitamin D deficiency. In Northern Jordan, the rate of vitamin D deficiency was reported to be 28% amongst children aged 6-36 months (39). Although linked to sun exposure, this deficiency was also correlated to feeding practices including exclusive breastfeeding (48). In 2015, a nationally representative survey of preschool children in Jordan showed a 19.8% prevalence of Vitamin D deficiency; and this deficiency was higher in females and children whose mothers were deficient especially in urban areas (39). In Gaza, the prevalence of vitamin A and D deficiency was reported to be 73.1% and 60.7% respectively; higher than in the West Bank. Also, anemic children were more likely to be deficient in vitamin A (32). Vitamin A deficiency amongst children under five has been reported to range between 0.5% to 72.9% in the region (68) with the highest rates reported from SoP(32) and low rates in Oman (9.5%) (69).

Participants confirmed that despite improvements in anemia in some countries, there was no marked improvement in nutritional status indicators especially stunting. In some cases, interviewees noted that "children are born stunted" and related that to the nutritional status of mothers.

Most interviewees relied on existing household surveys and data. In the case of Lebanon, there was emphasis on gaps in data to be able to clearly understand and monitor the situation. Lack of routine data collection was also highlighted in countries including Sudan.

In conclusion, findings show that despite improvement in some nutritional status indicators, there remains a considerable gap in progress. Therefore, there is a need to implement high impact evidence-based interventions that would contribute to shifting the transition and improving nutrition.

### 4.1.2 Complementary Feeding Habits

Complementary feeding indicators were compiled from household surveys for the six countries where available (data not available for Lebanon except for Syrian refugees). Appendix B is a compilation of these indicators and figure 7 is a summary of the indicators from the latest surveys. It is worth noting that there is limited evidence on this aspect of feeding and what is showing in this section is what was retrieved and obtained from interviews complemented with data from surveys and individualized studies.

The prevalence among children 6-23 months reaching the Minimum Diet Diversity (MDD) was highest in Oman (80.7%) and lowest in Sudan (28%). It is 62.6% in SoP, 51.4% in Jordan and 43.2% in Egypt. Trend overtime for this indicator was possible for Oman and Jordan showing an improvement in prevalence in Oman but a slight decrease in Jordan, possibly due to the inclusion of Syrian refugees in the survey and the lack of disaggregation (Figure 7).

The prevalence among children 6-23 months who receive the minimum frequency of meals is relatively high for SoP (75.4%), Oman (64.5%), Egypt (60.2%) and Jordan (62.2%) with the lowest prevalence in Sudan (40.7%) (Figure 7). Trend over time for Oman shows an improvement after a decline in 2014, possibly because it is a different type of household survey. Jordan shows a similar decrease as to the MDD (Figure 8).

Prevalence among children with minimum acceptable diets (MAD) remains low with a highest rate in Oman (47%) and a lowest in Sudan (15.1%) (Figure 8). Trend over time for this indicator is similar to the other indicators with Oman showing an improvement after a decline, also possibly explained due to the use of data from a different kind of household survey, and Jordan showing a decrease. The low prevalence of MDD and MAD show that the quality of the diet is mainly affected by the diversity of the diet.

For Lebanon specifically, there is data on Syrian refugees which cannot be extrapolated to the Lebanese population however show the situation amongst the refugees. The Vulnerability Assessment of Syrian Refugees (VASyR) shows that MDD amongst Syrian refugees in Lebanon is very low (17% in 2018) and is even lower than the rate in Sudan. Trend over time for Syrian refugees in Lebanon shows a stagnant situation with slight improvement in 2018 after a decrease in 2017 (Figure 9). Syrian refugees in Lebanon live both in informal settlements (a small proportion) and integrated in host communities.

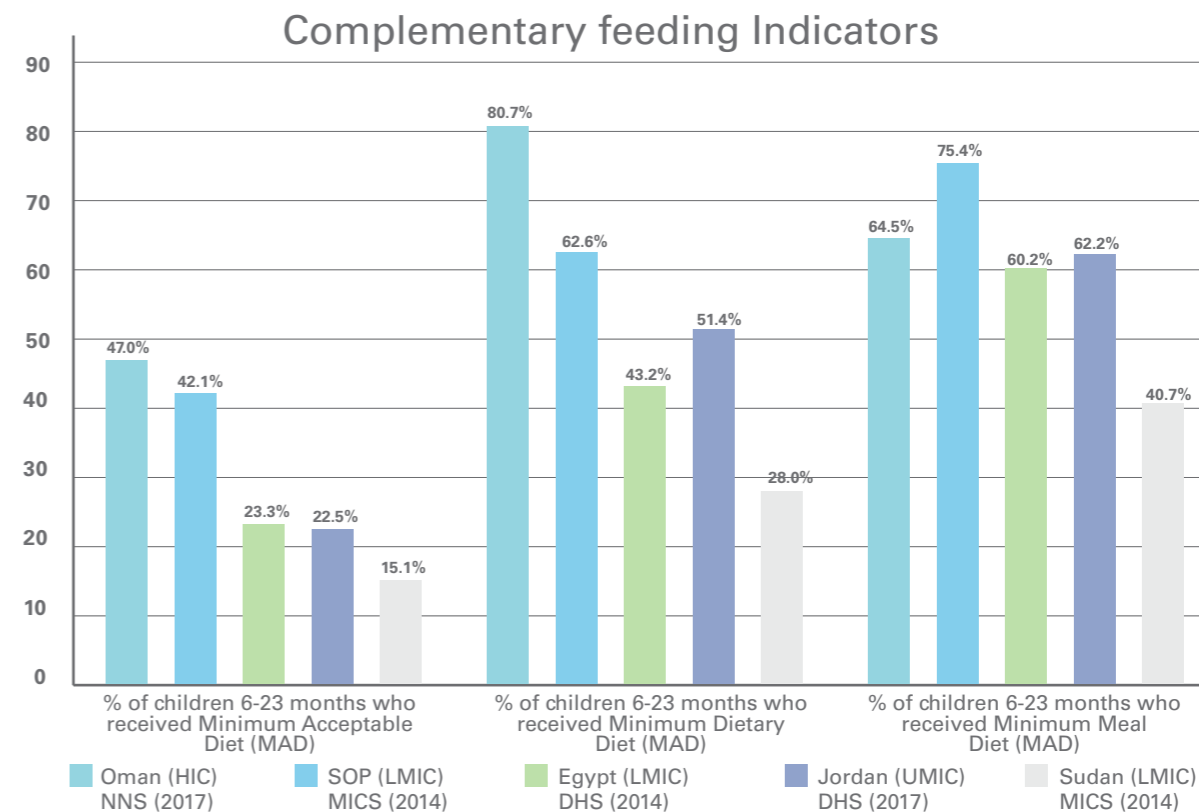


Figure 7 - Complementary Feeding Indicators based on household surveys

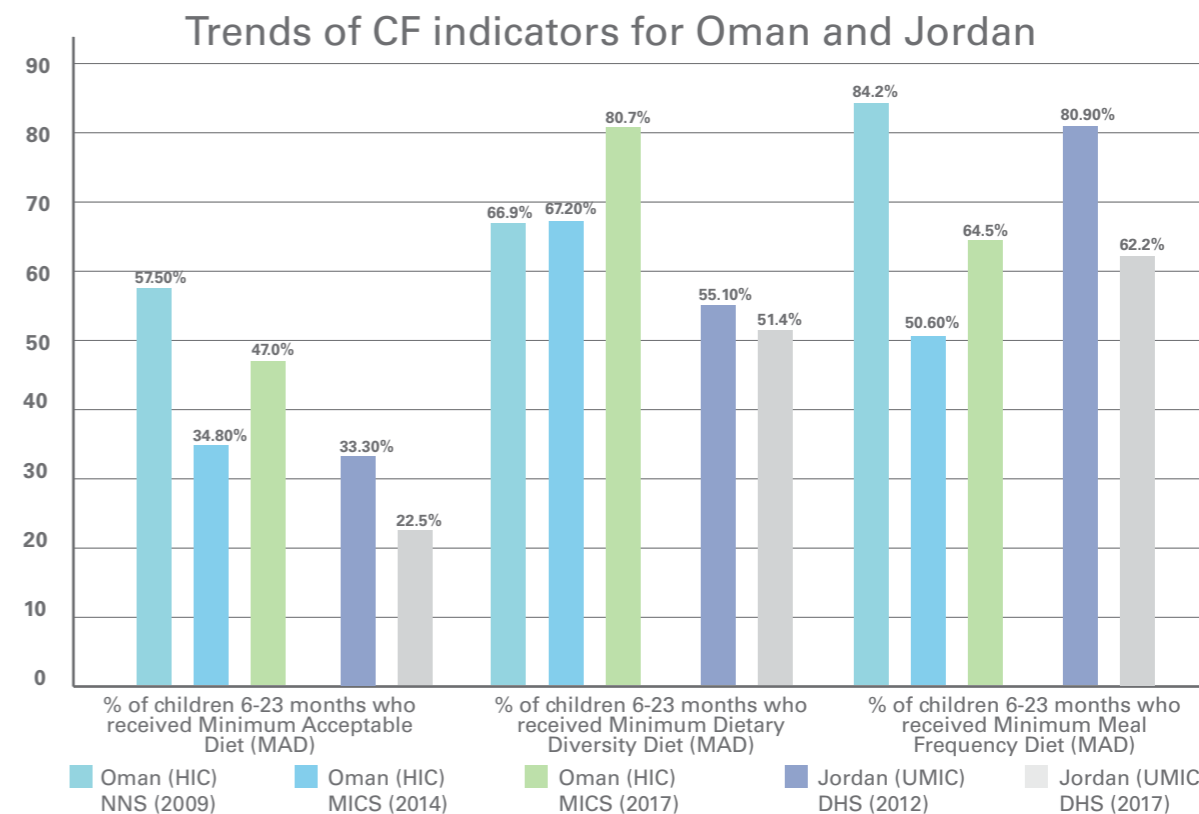
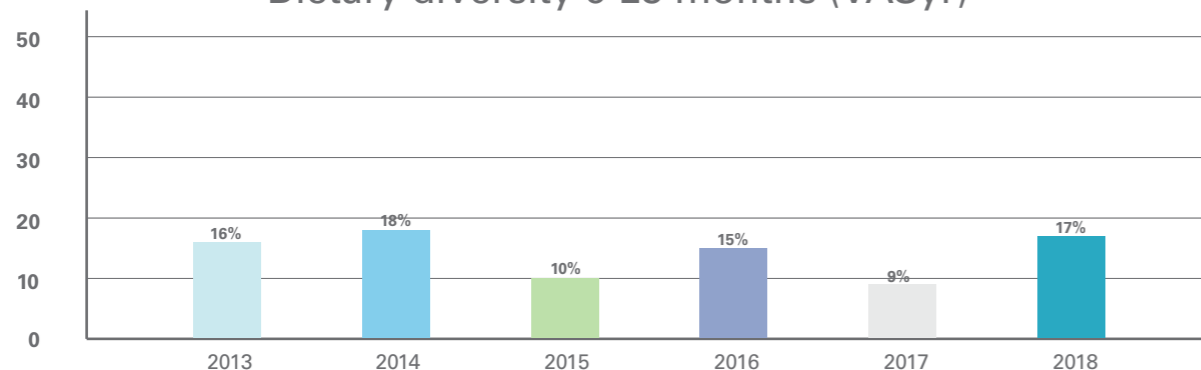


Figure 8 - Trends of Complementary Feeding Practices for Oman and Jordan

Dietary diversity 6-23 months (VASyr)



**Figure 9 - Trend over time of the prevalence of children with Minimum Diet Diversity amongst Syrian refugees in Lebanon**

Key informant interviews show that poor complementary feeding practices are prevalent. Besides referencing existing household surveys, participants were vocal about the different practices that are not in line with recommendations including 1) early or delayed introduction of solids, 2) poor quality of food introduced (diversity, consistency, etc.), and 3) regional disparities in practices.

#### 4.1.2.1 Early or delayed introduction of solids

Across interviews, key informants emphasized a number of prevalent misconceptions. In many cases infants are provided with solids very early. In some countries such as Egypt and Sudan, examples of infants being allowed to sample food items other than breastmilk or infant formula as early as one week or 40 days were mentioned (also referred to in Arabic as “tal7iss”). Examples were also given about mothers competing with each other on who starts solids earlier giving the impression that this is what makes the child stronger or chubbier or that it will make the child accept food more.

*“They say that this will help them in accepting food”* (Key informant – Egypt)

Early introduction of solids was related to the perception of not enough breastmilk for breastfed infants and the mother’s fear that there is a need to introduce food because her milk is not enough. This is reflected in findings from the household surveys mainly in Egypt where 31.9% of infants 4-5 months of age were receiving complementary food (43). In Sudan, a Knowledge Attitude and Practice (KAP) study conducted showed that the main reason for introducing solids early was to improve the health of the baby (40).

In Jordan, Abuidhail (2014) reported on feeding practices amongst Jordanian women where 79% of postpartum women in a convenient sample intended to give their infants fluids other than breast milk and 68% of them actually gave fluids to their infants by the end of the first month (41).

Batal et al (2010) collected data from patients of low to middle socioeconomic status from 20 health centers in Lebanon. Findings of the study showed early introduction of solids where 21.9% of children were introduced to solid foods and over 90% of children given other fluids before 4 months of age (noting that WHO recommendations at the time of data collection was 4 months exclusive breastfeeding) (42). The main foods given were cereals and the frequency of consumption of meats was relatively low.

In South Darfur, almost half of interviewed mothers believed that boys needed to be introduced to solids earlier (3 months) than girls (6 months) (40).

At the same time, key informants reported mothers delaying the introduction of solids as late as one year of age. This was mentioned for both breastfed and formula fed infants although some indication that this occurs more amongst breastfed infants was mentioned in Jordan. In fact, data from household surveys does show that MDD was higher among the non-breastfed across the countries (Figure 10). Mothers would continue giving the breast or the bottle as an easier option to giving food, which is warranted to be complicated.

The delayed introduction of solids was reflected in findings from the household surveys mainly in Egypt where the percentage of infants 6-8 months receiving solid, semi-solid, or soft food was 68.1% (43). While the percentage was 81% in Jordan (71), 95.6% in Oman (69), and 89.6% in SoP (20).

In both cases, early and delayed introduction of solids contributed to the poor CF practices.



#### 4.1.2.2 Poor quality of food introduced

Poor feeding practices consisted of providing food that is not appropriate for infants and young children. There were two ends of the spectrum in terms of the consistency of the food with informants reporting on mothers giving fully blended food in a bottle to mothers giving regular un-mashed family food. There were examples of mothers filling bottles with blended porridge or other starchy food items or continuing with bottle feeding, which was considered as an easy and uncomplicated option that does not require the “hassle of sitting the child and feeding” him/her.

*“The bottle is the way to go, if the child has the bottle the mother is free. But the food will be blended”* (Key informant – SoP).

A major emerging theme from key informants is that mothers and families relied on “family food” to feed their infants and young children. Although this may imply that children are receiving cooked varied meals however two main issues were raised regarding eating family food. One issue relates to the inability to know the amount of food children are eating. Examples of “feeding from the same plate” and “children were fed like adults” were given including in Sudan and Oman. Although in a KAP study conducted in Sudan in 2011, findings showed that 83% of interviewed mothers indicated that they prepared a separate meal while the remaining fed their children from “family meals” (40). Another issue was that family food was often perceived as inappropriate by parents. For example, there were instances where infants were being fed raw meat (“kebbe nayyeh”). On the other hand, examples of feeding mjaddarah in Lebanon was also given which, although perceived as inappropriate by parents, is made of lentils and rice and is considered a high nutritional value meal.

Other reported practices in most of the countries including Oman, Lebanon, and urban Sudan included the reliance on ready-made food such as those in jars or cereals (“cerelac”) sold in the market.

*“They [mothers] just want to fill their stomach”* (Key informant – Egypt)

DHS (2017) in Jordan reported that 18% of breastfed and 17% of non-breastfed infants were fed fortified baby food (71). The main reported reasons for this reliance included recommendations by pediatricians (Lebanon), fear that fresh food is not clean and may be contaminated (Lebanon), and convenience including the burden of preparing food at home and the widespread availability of these products (Oman and Lebanon).

*“There are poor feeding habits practiced by mother... lack of variety... although Omani food is rich in nutrients”* (Key informant – Oman)

Findings from the household surveys on diet diversity and quality were confirmed by key informants. There was a perception that food given to children lacked diversity, was of low nutritional value and there was an emphasis on starchy staple food. In terms of specific foods given, key informants reported that fruits and vegetables lacked as well as meat, and the consumption of ‘junk food’ was seen as common. Informants reported a high consumption of sweets and food items rich in sugar and salt including sweetened milk. A very common reported practice was the consumption of tea, coffee and bread on a regular basis by infants and young children. Eggs were often mentioned either as fed early or not fed for fear of allergy.

*“Various fruits and vegetables are available for consumption but food diversity for infants and children is not part of feeding culture. These fruits and vegetables are often sold”* (Key informant – Sudan).

In Egypt, in a first study examining the feeding practices of young children and household and community level influences on infant and young child nutrition, Kavle et al (2015) highlighted that mothers considered junk food to be good, natural and ‘essential’ complementary food and an easy way to feed toddlers (44). Junk food was defined as high energy, low in nutrient content and/or high in fat snack foods that contain added sugar (i.e. sugary biscuits, cream-filled sponge cakes, candy, fizzy drinks) or have high salt content (i.e. fried potato crisps (chips) (44).

Kavle et al (2015) reported that mothers and family members routinely give ‘preferred’ and ‘liked’ junk food, as part of the daily meal, with only small amounts of nutritious food (54). A recently conducted KAP study in Egypt reported preliminary findings including that a large proportion of children less than 2 years of age consumed high carbohydrates (78.5% rice, bread, and cereals) as well as ‘convenience store junk food’ including tea and chips (82.6%) (45). In Oman, the national nutrition survey reported that 67.5% of children under 5 years of age consumed tea at least one time per day (69).

Data from DHS in Egypt and Jordan showed that children who are still breastfed were less likely to consume the various types of food than children who are not being breastfed (43, 71). In general, the most frequently consumed food among breastfeeding and non-breastfeeding children was foods made from grains, roots and tubers, cheese, yogurt, and other milk-based products (Figure 10).

Other misconceptions were reported such as those in Eastern Sudan where it is believed that children should not be fed vegetables because they are not suitable.

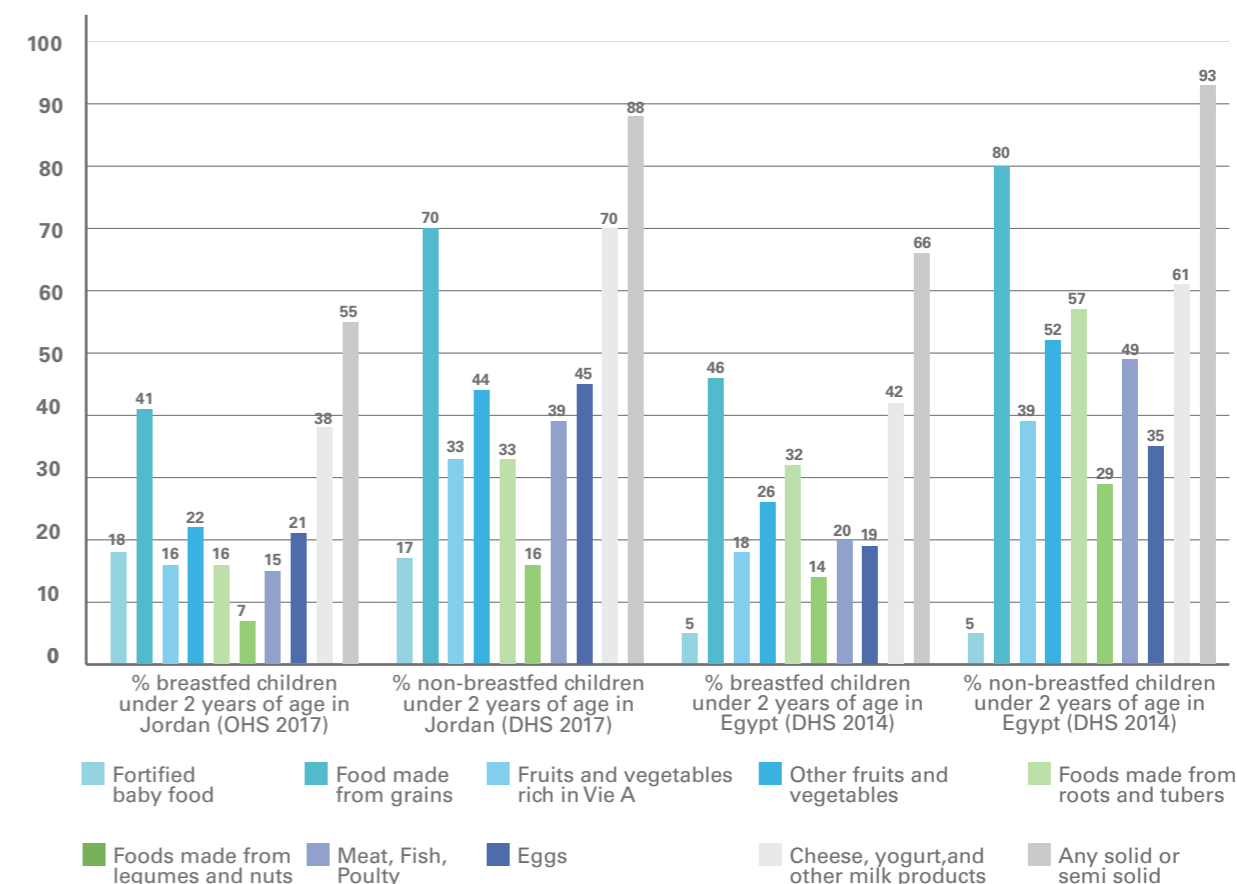


Figure 10 - Food consumption of infants and young children in Egypt and Jordan

#### 4.1.2.3 Regional disparities in feeding practices

A key finding from the interviews is that feeding habits differ extremely amongst areas, governorates, states, etc. within a country. In Sudan, Egypt, and Oman, reference was made to tribal communities which have very specific cultural practices that need to be further examined and accordingly addressed.

*“Sudan is extremely diverse in terms of culture and situation. There are pockets that are completely isolated from rest of the country. In some areas, people have been hiding for years... it is very difficult to make broad statements”*

In summary, findings show first that there is no in-depth analysis of the complementary feeding practices and in many cases, there is a need to do more investigation on the feeding practices at the regional level. It is apparent that CF practices are suboptimal and differ noticeably between areas including amongst nomads, rural, urban etc.

It is important to investigate the factors that contribute to these poor practices. The next section looks into more details at the determinants of complementary feeding practices in the 6 countries.

## 4.2 Determinants of Complementary Feeding

Factors associated with complementary feeding practices were examined at various levels including at the household and individual levels. The main data source for this information stems from interviews with key informants. These have been complemented with available data from reports and peer reviewed studies. In addition, preliminary analysis was conducted on household survey data from Sudan, Egypt, SoP, and Jordan in order to identify associations with complementary feeding practices.

The main identified determinants emerging from the themes of qualitative data are depicted in figures 11, 12 and table 5 below, which is a listing of the factors perceived by key informants for each country. Results from the preliminary analysis on household surveys is found in Appendix H and tables 5 to 11 in the different sections below.

A cross cutting theme is **maternal knowledge and attitudes** which was seen to be affected by factors related to existing social support systems, available health and nutrition services, factors at the household level, and those at

the individual level. These factors were seen to affect maternal knowledge and attitude and therefore her behavior and practices.

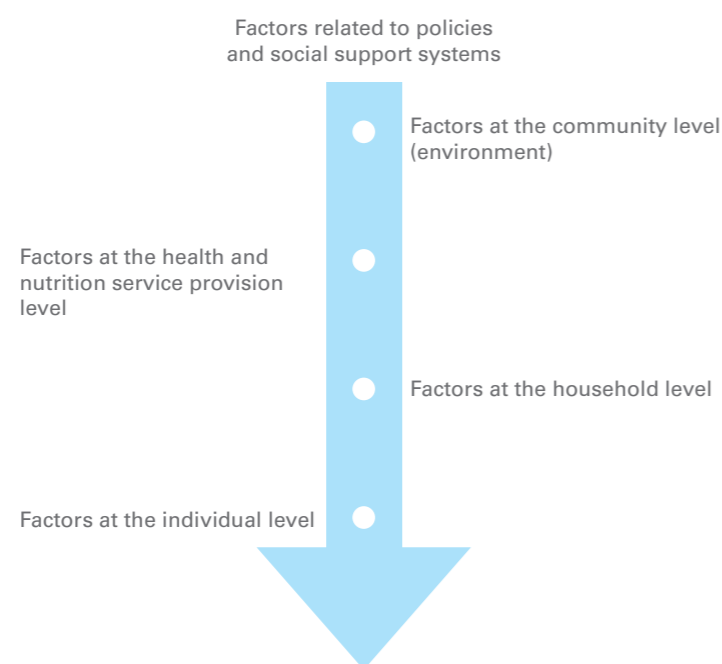


Figure 11 - Determinants identified through emerging themes from key informant interviews

Table 5 - Perceived determinants of complementary feeding practices by country - Findings from key informant interviews

Factor	Egypt	Jordan	Lebanon	Oman	SoP	Sudan
<b>Lack of awareness amongst mothers (knowledge)</b>	+++	+++	++	++	++	+++
<b>Individual level</b>						
Nutritional status of mother		++				
Educational status of mother	+	++	-	-	-	++
Early marriage / young mother	+	-	-	-		+++
<b>Household level</b>						
Effect of mother in law, mother, father, other family members or caretakers (housemaids) and other care takers such as nurseries	+++	+++	+++	+++	++++	+++
Poverty affecting access to food – high cost of food	+++ (Cost of fruits and vegetables)	++	+	+	+++ (Cost of fruits and vegetables)	+++
					+++ War and lack of employment	
Water pollution and other WASH factors	-	-	++		+	+++ (disease and hygiene)

Factor	Egypt	Jordan	Lebanon	Oman	SoP	Sudan
<b>Community level</b>						
Cultural beliefs, traditions, habits, peer pressure	+++	+++	++	+++	++	+++
<b>Health care level (institutional)</b>						
Access to health care (presence and quality of counselling including breastfeeding counselling)	++	++	++	++	++	++
<b>Policy level</b>						
Country policies related to marketing	Not mentioned	Not perceived as a factor	Is a factor	Could be a factor	Not indicated	Not perceived as a factor
Other policy factors	Subsidized low nutritional value food leads to their consumption	-	Conflict in recommendations related to introduction of solid between different entities	-	Maternity leave / working mothers	-

+++ very strong perceived relation with CF practices  
 ++ medium perceived relation with CF practices  
 + weak perceived relation with CF practices  
 - not mentioned

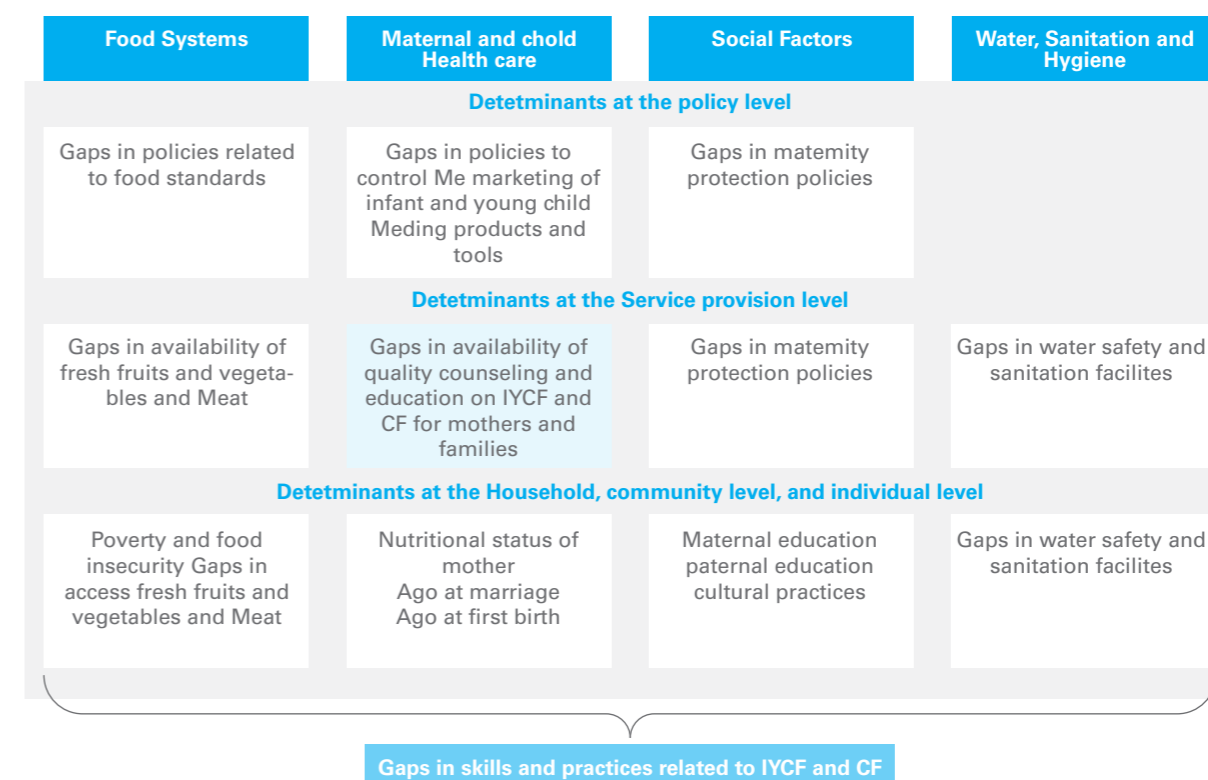


Figure 12 - Framework for identified determinants of CF practices - compilation from qualitative and quantitative data

### 4.2.1 Determinants of CF at the individual level

#### 4.2.1.1 Maternal knowledge, attitude, and behavior

Maternal knowledge and attitude about feeding of infants and young children seems to be a main determinant affecting feeding practices as perceived by key informants. There was emphasis on gaps in awareness of mothers and other caregivers about the kind of food to be given to children, thus affecting their feeding habits. This gap in knowledge about maternal and child health has been examined by Kavle et al (2018) who reported that women have little understanding about issues related to maternal and child health in Egypt (45). There was also a perception that some mothers don't have the right attitude towards feeding their children.

*"Mothers are not motivated to put an effort towards feeding their children"* (key informant - Oman)

#### 4.2.1.2 Maternal education and literacy level

Although not highly emphasized by key informants, analysis of household surveys showed that at least in Sudan and Egypt, there was a strong association between maternal educational level and complementary feeding indicators (Table 6, Figure 13).

Table 6 - Odds of child intake of minimum diet diversity, minimum meal frequency and minimum acceptable diet by Maternal Education Level in Sudan, Egypt, State of Palestine and Jordan (OR %95CI).

	Sudan		Egypt		State of Palestine		Jordan	
MDD (all children 6-23 months)	OR (95%CI)	P value	OR (95%CI)	P value	OR (95%CI)	P value	OR (95%CI)	P value
<b>Maternal Educational Level</b>								
None/Primary	Ref		Ref		Ref		Ref	
Secondary	3.09 (2.45;3.90)	***	1.12 (0.95;1.32)		1.37 (1.11;1.70)	**	2.12 (1.36;3.30)	**
Higher	4.23 (3.05;5.88)	***	1.38 (1.12;1.69)	**	2.55 (2.04;3.18)	***	2.05 (1.30;3.22)	**
<b>MMF (all children 6-23 months)</b>								
<b>Maternal Educational Level</b>								
None/Primary	Ref		Ref		Ref		Ref	
Secondary	1.44 (1.14;1.83)	**	1.35 (1.15;1.59)	***	1.30 (0.81;30.19)	*	1.26 (0.82;1.94)	
Higher	1.73 (1.22;2.44)	**	1.74 (1.41;2.16)	***	2.00 (1.54;2.61)	***	1.67 (1.02;2.75)	*
<b>MAD (all children 6-23 months)</b>								
<b>Maternal Educational Level</b>								
None	Ref		Ref		Ref		Ref	
Secondary	2.60 (1.99;3.40)	***	1.12 (0.92;1.35)		1.32 (1.05;1.66)	*	1.97 (1.04;3.72)	*
Higher	3.43 (2.34;5.03)	***	1.53 (1.21;1.94)	***	2.83 (2.26;3.54)	***	2.12 (1.11;4.03)	*

\* p<0.05

\*\* p<0.01

\*\*\*p<0.001

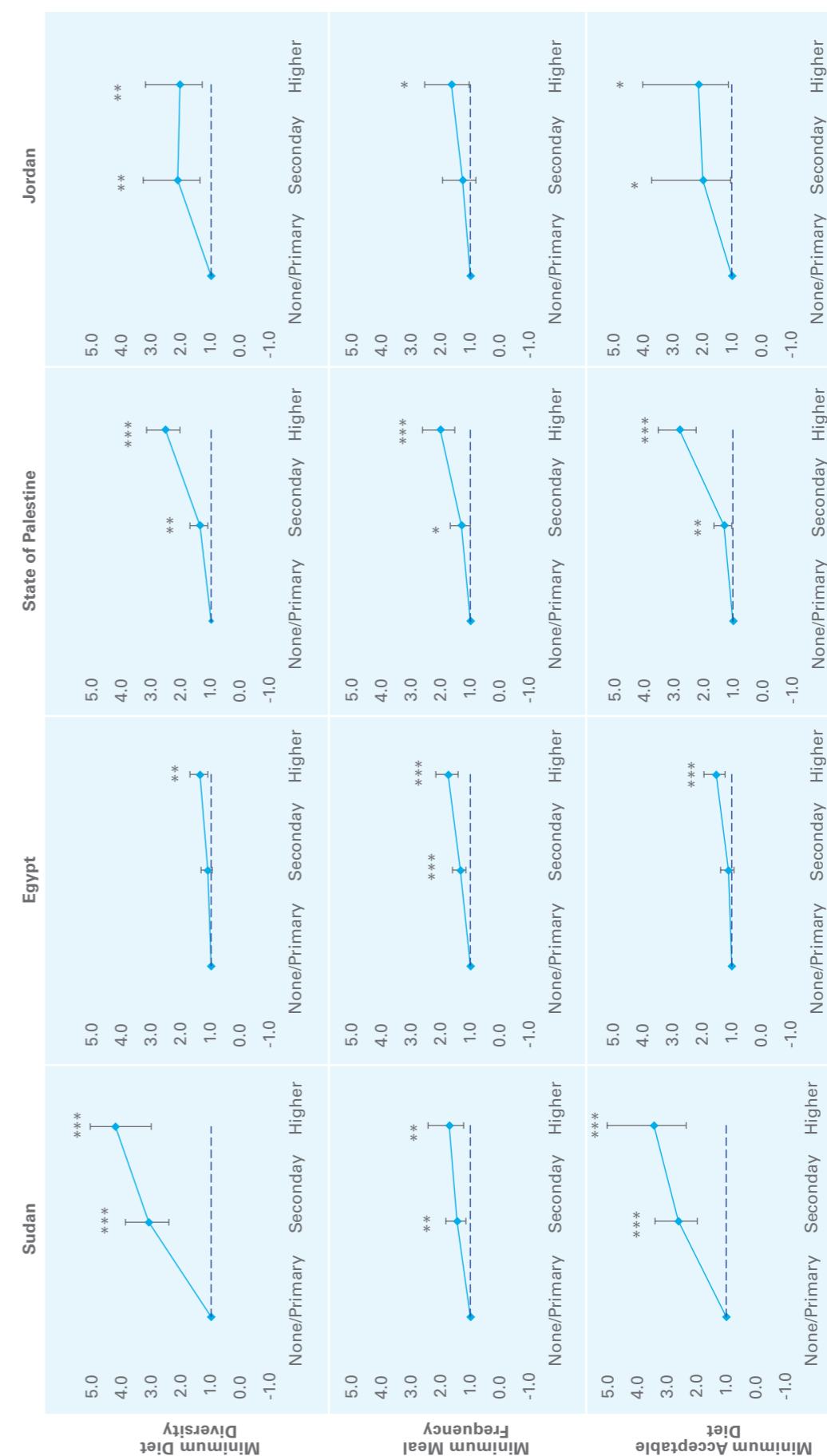


Figure 13 - Odds of child intake of minimum diet diversity, minimum meal frequency and minimum acceptable diet by maternal education level in Sudan, Egypt, State of Palestine and Jordan (OR %95CI). Model includes sampling weights. The horizontal red dotted line indicates an odd ratio of 1 where there is no association between complementary feeding indicators and maternal education level. The vertical lines of the circle represent

These findings are in line with studies looking at determinants of breastfeeding. Al Nuaimi et al (2017) reported that maternal educational level was a factor affecting breastfeeding duration (46). Similarly, in Egypt, El Shafei and Labib (2014) examined determinants related to timely introduction of solids and found that maternal education was significantly associated with early introduction of solids (47). Also, El-Gilany and Abdel-Hady (2014) reported on factors affecting pre-lacteal feeds in Egypt and independent predictors included maternal education (48).

#### 4.2.1.3 Mother's age at first marriage / first birth

Key informants highlighted the role of early marriage in shaping feeding practices. They related that to mothers' educational status as well as awareness about care for children including nutrition. Young mothers were reported to lack the experience and to rely on their own mothers or mothers-in-law who themselves did not have the appropriate knowledge related to complementary feeding.

This was confirmed by the household surveys analysis which showed that being 18 years of age or under was negatively associated with MDD scores in Sudan and SoP. The association was less strong for MMF which may indicate that regardless of the lack of experience that the mother may have, she would still provide food frequently to respond to her child's hunger cues, however, the diversity and quality of the food would be affected (Table 7).

**Table 7 - Odds of child intake of minimum diet diversity, minimum meal frequency and minimum acceptable diet by Mother's age at first marriage in Sudan, Egypt, State of Palestine and Jordan (OR %95CI).**

	Sudan		Egypt		State of Palestine		Jordan	
	OR (95%CI)	P value	OR (95%CI)	P value	OR (95%CI)	P value	OR (95%CI)	P value
<b>MDD (all children 6-23 months)</b>								
Mother's age at first marriage								
<b>Above 18 years</b>	Ref		Ref		Ref		Ref	
<b>18 years and under</b>	0.58 (0.49;0.70)	***	0.89 (0.76;1.02)		0.67 (0.56;0.80)	***	0.99 (0.77;1.26)	
Age at first birth								
<b>Above 18 years</b>	Ref		Ref		Ref		Ref	
<b>18 years and under</b>	0.76 (0.62;0.94)	*	0.92 (0.77;1.08)		0.85 (0.72;1.01)		1.09 (0.80;1.47)	
<b>MMF (all children 6-23 months)</b>								
Mother's age at first marriage								
<b>Above 18 years</b>	Ref		Ref		Ref		Ref	
<b>18 years and under</b>	0.92 (0.77;1.11)		0.82 (0.71;0.94)	**	0.59 (0.47;0.73)	***	1.24 (0.96;1.61)	
Age at first birth								
<b>Above 18 years</b>	Ref		Ref		Ref		Ref	
<b>18 years and under</b>	1.08 (0.89;1.31)		0.85 (0.72;1.01)		0.87 (0.70;1.07)		0.89 (0.64;1.24)	
<b>MAD (all children 6-23 months)</b>								
Mother's age at first marriage								
<b>Above 18 years</b>	Ref		Ref		Ref		Ref	
<b>18 years and under</b>	0.60 (0.48;0.75)	***	0.85 (0.73;1.01)		0.60 (0.50;0.72)	***	1.10 (0.81;1.46)	
Age at first birth								
<b>Above 18 years</b>	Ref		Ref		Ref		Ref	
<b>18 years and under</b>	0.71 (0.55;0.92)	*	0.95 (0.77;1.15)		0.8 (0.67;0.96)	*	1.02 (0.70;1.48)	

\* p<0.05

\*\* p<0.01

\*\*\*p<0.001

Age of the mothers in relation to breastfeeding practices was examined by Musmar and Qanadeelu (2012) who showed that mothers aged 35 and above were less likely to breastfeed in SoP (49). Also, in Egypt, Kandeel et al (2018) examined the determinants for artificial feeding and reported that young mothers (25 years or younger) and first-time mothers had a higher tendency to choose artificial feeding rather than exclusive breastfeeding (50). On the other hand, Mohammed et al (2014) found that exclusive breastfeeding was associated with mother's education but not with mother's age at birth in El-Minia governorate in Egypt (51).

#### 4.2.1.4 Nutritional status of the mother

Key informants mentioned the nutritional status of the mother as a perceived determinant for feeding practices as well as nutritional status of the child. In SoP, the micronutrient survey showed that anemia in children under five was a reflection of their mother's micronutrient status (32). On the other hand, this was not confirmed by the analysis of household surveys. As shown in Appendix H, there was no significant association between maternal nutritional status indicators and complementary feeding indicators.

#### 4.2.1.5 Breastfeeding problems and success

A key determinant that has been identified via qualitative data relates to problems with breastfeeding in the first six months. Interviewees highlighted that complementary feeding practices are often dictated by the successful breastfeeding journey and the extent to which mothers received lactation support.

"It starts with problems with breastfeeding and mothers have difficulties with breastfeeding.... She starts introducing food, and the problem of malnutrition and solid food persists until 5 years" (Key informant – Sudan)

In Egypt, Kavle et al (2015) showed that prelacteal feeding is an entry point to early introduction of junk foods and is a remedy for perceived insufficient breast milk (44). Also, in rural Egypt, lactation problems were significantly correlated with early introduction of solids (47).

## 4.2.2 Determinants of CF at the household level

### 4.2.2.1 The influence of family members and other sociocultural factors

Grandmothers, mothers in law, fathers, sisters, and other caregivers were all mentioned as affecting food habits and maternal choices when it comes to providing food for infants and young children.

"Mothers are getting information from mothers and grandmother and in the urban area they depend on ready to eat food [brand of ready made cereal]... they don't have the skills to prepare the food" (Key informant – Sudan).

This influence has been confirmed in two KAP studies in Egypt where it was shown that older people were considered the main source of knowledge on child care, especially grandmothers, and their knowledge is greatly respected (52). Similarly, in Sudan, a KAP study showed that grandmothers were reported to be the major influencers for decisions on breastfeeding, and other relatives were an important source of information for complementary feeding (40). Al-Akour et al (2010) showed that presence of supportive husbands is associated with intention to breastfeed amongst Syrians and Jordanians and therefore could also play a role in other feeding practices such as complementary feeding (53).

In Oman and Lebanon specifically, the role of the "house maid" was emphasized by key informants as affecting feeding practices where mother relied on the helper to feed the baby. Often from different nationality, the latter would feed the child according to her culture.

The influence of the father can be examined through the analysis of the household surveys. The analysis showed a positive association between paternal educational level and feeding indicators (Table 8).

Table 8 - Odds of child intake of minimum diet diversity, minimum meal frequency and minimum acceptable diet by Paternal education in Sudan, Egypt, State of Palestine and Jordan (OR %95CI).

	Sudan		Egypt		State of Palestine		Jordan	
	OR (95%CI)	P value	OR (95%CI)	P value	OR (95%CI)	P value	OR (95%CI)	P value
<b>MDD (all children 6-23 months)</b>								
Paternal Educational Level								
<b>None/Primary</b>	Ref		Ref		Ref		Ref	
<b>Secondary</b>	2.48 (1.98;3.11)	***	1.23 (1.04;1.44)	*	1.15 (0.93;1.41)		1.33 (0.94;1.90)	
<b>Higher</b>	3.57 (2.55;5.01)	***	1.19 (0.97;1.47)		1.70 (1.37;2.11)	***	1.61 (1.09;2.38)	*
<b>Father not in household</b>	1.40 (1.02;1.91)	**			1.36 (0.64;2.89)			
<b>MMF (all children 6-23 months)</b>								
Paternal Educational Level								
<b>None/Primary</b>	Ref		Ref		Ref		Ref	
<b>Secondary</b>	1.19 (0.94;1.50)		1.30 (1.10;1.53)	**	1.11 (0.87;1.43)		1.49 (1.03;2.17)	*
<b>Higher</b>	1.50 (1.05;2.14)	*	1.70 (1.37;2.11)	***	1.78 (1.36;2.33)	***	1.69 (1.11;2.56)	*
<b>Father not in household</b>	0.99 (0.74;1.33)				1.42 (0.53;3.81)			
<b>MAD (all children 6-23 months)</b>								
Paternal Educational Level								
<b>None</b>	Ref		Ref		Ref		Ref	
<b>Secondary</b>	2.12 (1.61;2.79)	***	1.16 (0.96;1.41)		1.25 (1.00;1.55)	*	1.61 (0.97;2.67)	
<b>Higher</b>	3.16 (2.14;4.67)	***	1.40 (1.10;1.78)	**	2.03 (1.64;2.51)	***	2.06 (1.20;3.53)	**
<b>Father not in household</b>	1.46 (0.98;2.16)				1.40 (0.65;3.01)			

\* p&lt;0.05

\*\* p&lt;0.01

\*\*\*p&lt;0.001

#### 4.2.2.2 Wealth, Residence and Food security

In countries such as Sudan and SoP, there was emphasis that food security and socioeconomic status are key determinants of feeding habits. The high cost of fruits and vegetables and access of families to healthier options were perceived as affecting the choice of families and mothers in terms of what to feed their infants.

*"Sudan is facing the problem of poverty and the food available is not so good. Household food security is not good"* (Key informant – Sudan).

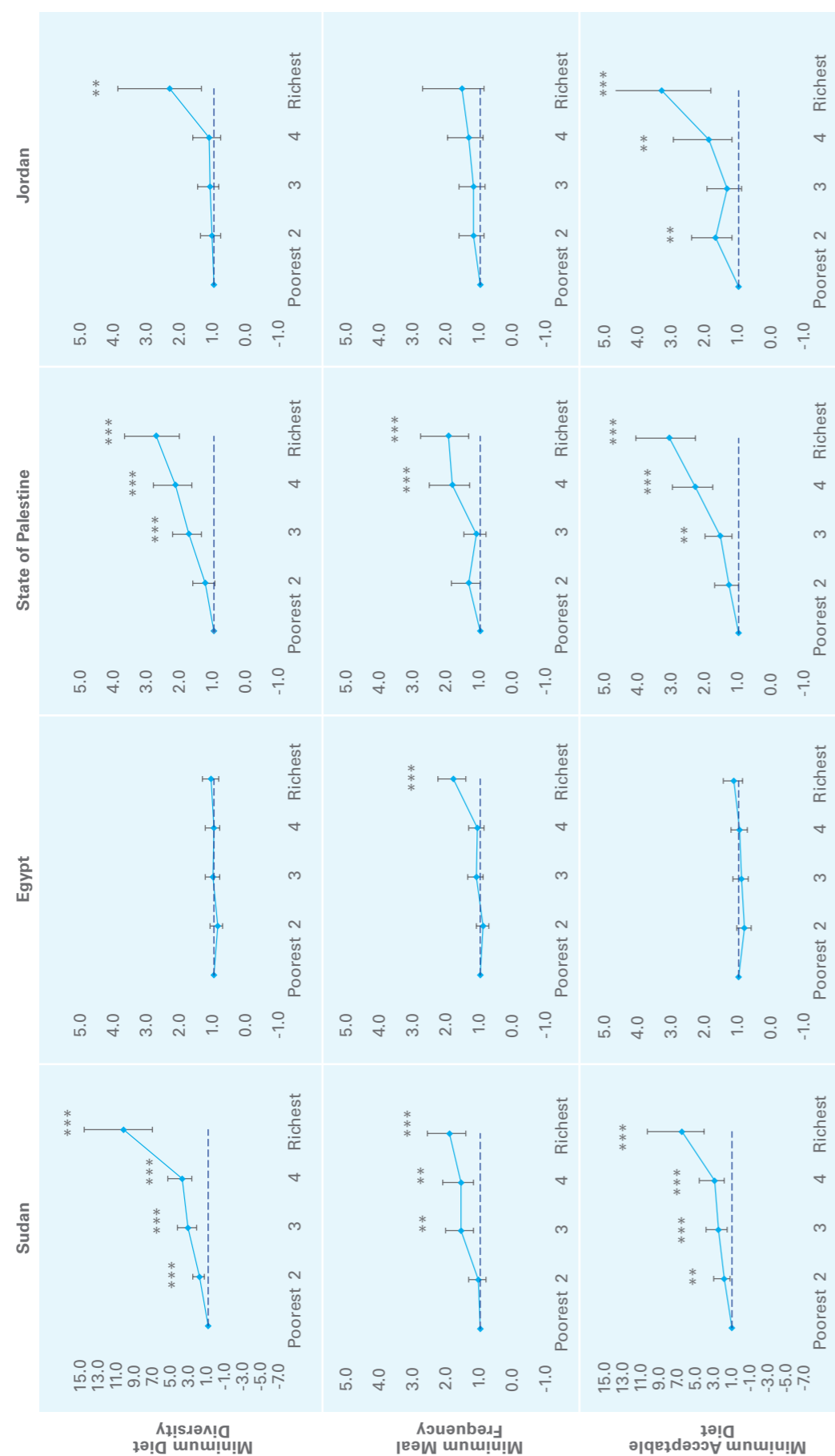
In Egypt, Jordan, Lebanon and Oman, these were perceived as less significant while acknowledging that in some pockets and areas within the countries, these factors continue to play a role.

Analysis of household surveys showed that wealth index of families / households was positively associated with complementary feeding indicators, especially diet diversity and most significantly in Sudan and SoP, but not in Egypt (Table 9, Figure 14). The wealthier the family, the better the diet diversity, meal frequency, and adequacy of the diet. This association was not seen in Egypt and was also confirmed by key informants possibly implying that other determinants such as awareness and knowledge of the mother may play a stronger role. Similarly, living in a rural area was negatively associated with diet diversity in Sudan and SoP, while it was significant for meal frequency in Egypt. Table 9 - Odds of child intake of minimum diet diversity, minimum meal frequency and minimum acceptable diet by Wealth Index and Residence in Sudan, Egypt, State of Palestine and Jordan (OR %95CI).

	Sudan		Egypt		State of Palestine		Jordan	
	OR (95%CI)	P value	OR (95%CI)	P value	OR (95%CI)	P value	OR (95%CI)	P value
<b>MDD (all children 6-23 months)</b>								
Wealth Index								
<b>Poorest</b>	Ref		Ref		Ref		Ref	
<b>Second/Poorer</b>	1.90 (1.36;2.65)	***	0.88 (0.71;1.10)		1.25 (0.96;1.62)		1.04 (0.79;1.38)	
<b>Middle</b>	3.16 (2.27;4.40)	***	1.02 (0.83;1.26)		1.75 (1.36;2.26)	***	1.11 (0.83;1.49)	
<b>Fourth/Richer</b>	3.85 (2.72;5.45)	***	1.00 (0.81;1.24)		2.16 (1.67;2.81)	***	1.13 (0.79;1.62)	
<b>Richest</b>	10.29 (7.19;14.74)	***	1.06 (0.85;1.33)		2.74 (2.04;3.68)	***	2.32 (1.38;3.91)	**
Residence								
<b>Urban</b>	Ref		Ref		Ref		Ref	
<b>Rural</b>	0.46 (0.38;0.55)	***	0.99 (0.86;1.14)		1.82 (1.41;2.35)	***	0.96 (0.74;1.23)	
<b>Camp</b>					1.47 (1.09;2.00)	*		
<b>MMF (all children 6-23 months)</b>								
Wealth Index								
<b>Poorest</b>	Ref		Ref		Ref		Ref	
<b>Second/Poorer</b>	1.05 (0.82;1.35)		0.89 (0.72;1.11)		1.34 (0.98;1.85)		1.20 (0.88;1.64)	
<b>Middle</b>	1.56 (1.20;2.02)	**	1.11 (0.89;1.37)		1.11 (0.82;1.49)		1.18 (0.86;1.62)	
<b>Fourth/Richer</b>	1.58 (1.18;2.11)	**	1.08 (0.86;1.34)		1.82 (1.32;2.52)	***	1.34 (0.9;1.99)	
<b>Richest</b>	1.91 (1.41;2.59)	***	1.78 (1.42;2.25)	***	1.93 (1.34;2.78)	***	1.53 (0.86;2.72)	
Residence								
<b>Urban</b>	Ref		Ref		Ref		Ref	
<b>Rural</b>	1.08 (0.89;1.31)		0.79 (0.68;0.91)	**	1.25 (0.92;1.70)		1.18 (0.90;1.56)	
<b>Camp</b>					1.19 (0.83;1.70)			
<b>MAD (all children 6-23 months)</b>								
Wealth Index								
<b>Poorest</b>	Ref		Ref		Ref		Ref	
<b>Second/Poorer</b>	1.88 (1.18;2.99)	**	0.80 (0.62;1.03)		1.28 (0.97;1.70)		1.68 (1.17;2.41)	**
<b>Middle</b>	2.46 (1.58;3.85)	***	0.90 (0.70;1.16)		1.54 (1.18;2.01)	**	1.33 (0.91;1.94)	
<b>Fourth/Richer</b>	2.92 (1.84;4.62)	***	0.94 (0.73;1.21)		2.29 (1.75;2.99)	***	1.88 (1.02;2.96)	**
<b>Richest</b>	6.54 (4.11;10.39)	***	1.11 (0.87;1.43)		3.05 (2.28;4.08)	***	3.29 (1.82;5.93)	***
Residence								
<b>Urban</b>	Ref		Ref		Ref		Ref	
<b>Rural</b>	0.70 (0.55;0.89)	**	0.96 (0.81;1.12)		1.62 (1.27;2.06)	***	1.07 (0.79;1.46)	
<b>Camp</b>					1.18 (0.87;1.58)			

\* p&lt;0.05 \*\* p&lt;0.01 \*\*\*p&lt;0.001





**Figure 14 - Odds of child intake of minimum diet diversity, minimum meal frequency and minimum acceptable diet by wealth quintiles in Sudan, Egypt, State of Palestine and Jordan (OR %95CI). Model includes sampling weights. The horizontal red dotted line indicates an odd ratio of 1 where there is no association between complementary feeding indicators and wealth quintiles. The vertical lines of the circle represent the 95 %**

An individual study in Egypt showed that in rural areas, farm households purchase most of their foods rather than consume what they produce and given the high cost of fruits, vegetables, and meat, they end up consuming lower nutritional value items (54). The rise in cost of fruits and vegetables has been reported to affect household access to food and purchasing power (44). Specifically, Kavle et al (2018) reported that maternal food choice is driven by affordability as well as food preferences, and perceived appropriateness of food for consumption during a certain stage (pregnancy for example) (45). Food insecurity has been reported in Bedouins living in rural areas in both Lebanon (55) and Jordan (56).

In SoP specifically, the complex political and security situation was highlighted as rendering the population more vulnerable and playing a strong role in shaping feeding practices. At the same time, the analysis showed strong association between household wealth status and CF practices in SoP (Figure 14). It may be that wealthier families may have better access to nutrient-dense food even in conflict affected areas.

**4.2.2.3 Water, Sanitation and Hygiene**

The role of water pollution and water quality in feeding practices was mentioned in Lebanon, SoP, and Sudan (Table 5). Key informants highlighted that often the lack of clean water affects the choice of the food and makes it difficult for families to clean the food before giving it to children. Water pollution was mainly mentioned in Lebanon, while sanitation and hygiene were also mentioned in SoP and Sudan. Analysis of household surveys shows that improved household drinking water source is associated with better diet diversity in Sudan and SoP. The significance is also seen in meal frequency in SoP. For Sudan, a significant association was found between having an improved toilet and diet diversity.

Table 10 - Odds of child intake of minimum diet diversity, minimum meal frequency and minimum acceptable diet by Drinking water source and toilet type in Sudan, Egypt, State of Palestine and Jordan (OR %95CI).

	Sudan		Egypt		State of Palestine		Jordan	
	OR (95%CI)	P value	OR (95%CI)	P value	OR (95%CI)	P value	OR (95%CI)	P value
<b>MDD (all children 6-23 months)</b>								
<b>Households drinking water source</b>								
Unimproved	Ref		Ref		Ref		Ref	
Improved	2.12 (1.69;2.65)	***	1.07 (0.77;1.48)		1.72 (1.44;2.05)	***	0.94 (0.75;1.19)	
<b>Toilet type</b>								
Unimproved	Ref							
Improved	3.07 (2.54;3.70)	***	2.26 (0.48;10.62)		0.77 (0.19;3.13)			
<b>MMF (all children 6-23 months)</b>								
<b>Households drinking water source</b>								
Unimproved	Ref		Ref		Ref		Ref	
Improved	1.21 (0.99;1.48)		1.22 (0.87;1.71)		1.31 (1.06;1.62)	*	0.79 (0.61;1.02)	
<b>Toilet type</b>								
Unimproved	Ref		Ref		Ref			
Improved	1.22 (1.01;1.47)	*	2.26 (0.54;9.50)		2.19 (0.53;9.11)			
<b>MAD (all children 6-23 months)</b>								
<b>Households drinking water source</b>								
Unimproved	Ref		Ref		Ref		Ref	
Improved	2.00 (1.52;2.63)	***	1.16 (0.80;1.69)		1.78 (1.48;2.13)	***	0.97 (0.73;1.29)	
<b>Toilet type</b>								
Unimproved	Ref		Ref		Ref			
Improved	2.35 (1.87;2.95)	***	1.64 (0.26;10.35)		0.97 (0.29;3.58)			

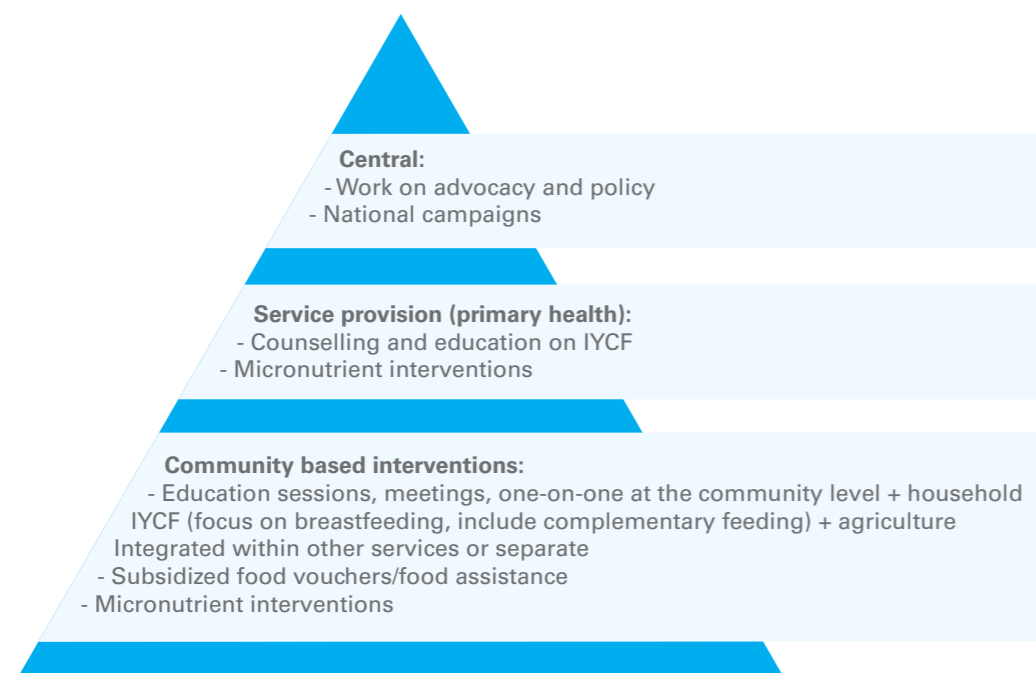
\* p<0.05 \*\* p<0.01 \*\*\*p<0.001

## 4.3 Program Description and Determinants at the Health Care System Level

### 4.3.1 Description of programs and interventions

Programs, interventions, and activities to improve complementary feeding practices varied between different countries and implementing agencies. Results from the survey questionnaire are included in Appendix I. To note that only 8 organizations responded to the questionnaire (3 from Sudan, 2 from Lebanon, 2 from SoP, and 1 from Egypt) and therefore the mapping cannot be considered as complete.

Three main categories of interventions were identified from data collected via the questionnaire, other program documents and key informants: 1) national campaigns and advocacy, 2) service provision at the primary health level, and 3) community based interventions including provision of food assistance.



**Figure 15 - Summary of programmatic interventions**

At the national level, key informants reported activities including national campaigns and advocacy work to improve nutrition. For example, in Egypt a presidential initiative was mentioned on improving stunting that includes awareness and education on nutrition for children. In Lebanon, national breastfeeding campaigns were reported that include messages on the timely introduction of solids.

At the service provision level, main activities consisted of any or all of the following: 1) Provision of education (one-on-one), 2) Provision of counselling (one-on-one), 3) Awareness sessions (group sessions), 3) micronutrient interventions (distribution of micronutrient sprinkles or provision of micronutrients).

Within the 8 organizations, all indicated providing education on IYCF to mothers and 7 indicated providing one-on-one counselling in addition to education (all except one in Lebanon). Counselling was indicated to be provided by health care practitioners including doctors, nurses, health educators and community health workers. Other nutrition services included growth monitoring, food vouchers, and treatment for acute malnutrition (severe and moderate).

At the community level, peer support and mother to mother support groups as well as community outreach and education such as awareness sessions for mothers and other care givers were reported.

Also, at the community level, food vouchers and food subsidy programs were mentioned in Egypt. The Takafol program was reported to be implemented by the government in support of poor families with children under 18 years of age which includes the provision of cash proportional to the number of children (65).

In addition, micronutrient interventions were mentioned including food fortification (namely Iron and Iodine) and micronutrient distribution (emergency and refugee contexts). Iron and Iodine fortification was reported in Jordan, Lebanon, Oman, and SoP albeit varying in extent of implementation. In Sudan, Lebanon, and SoP, micronutrient distribution was reported in populations affected by the relevant crises.

Agriculture interventions were reported by participants mainly in Egypt where it was reported that education on diet diversity was provided to farmers as part of their capacity building at the community level (54). These interventions were focused on one geographic area in Egypt and consisted of building the capacity of farmers in addition to providing awareness on nutrition including diet diversity.

### 4.3.2 Barriers and successes related to programs in Oman, Egypt, and Sudan (Determinants of CF at the program level)

Identified barriers and successes related to programs were those relevant to behavior change interventions and service provision within the health care system. Gaps at the different levels of the health care system (whether at the secondary, primary, or community levels) were identified including those related to breastfeeding support which was seen as also affecting complementary feeding practices and support. In most cases, there was agreement that behavior change takes a long time and therefore is quite challenging. The main gaps in programming include quality of the services and access, which were also perceived as determinants for CF practices.

#### 4.3.2.1 Quality of services, integration of CF messaging, and implementation

In most of the countries, messaging and provision of counselling and education on complementary feeding was not explicit and would be part of the IYCF counselling which focused mainly on breastfeeding.

**Educational material** such as flyers and posters were used in most of the interventions, however posters were sometimes reported not to be used, or unavailable or would lack key messages on complementary feeding. A compilation of existing educational material was mapped out and content was assessed in terms of compliance with CF guidance (Appendix J). Most of the educational material included the basic messages on complementary feeding, however sometimes lacked messages related to responsive feeding. The quality and content of the material differed in terms of reaching both literate and illiterate where some were mostly verbal. In addition, some material, although printed and prepared, was not always disseminated or provided to families. For example, in one of the primary health centers (PHC) visited, health care providers reported shortages in flyers. Or, in other cases, this material is fairly new and hasn't yet been disseminated. In Egypt and Lebanon, conflicting educational material was reported and identified among different entities developing the material. In Lebanon, the MoPH recommends introduction of solids at 6 months while it was reported that the pediatric society recommends starting solids between 4 and 6 months and this reflected in their material. In Egypt, it was reported that material is being produced separately by the government and other entities (NGOs etc.) without coordination. In Sudan and Egypt, the issue of dealing with illiteracy was also noted. In short, despite the presence of certain educational materials, their dissemination and uptake is not fully implemented; and thus their effectiveness is limited.

One of the main perceived gaps related to programming in the six countries consisted of the **lack of human resources and gaps in knowledge of the healthcare providers** relaying messages to mothers. Poor counselling and communication skills were reported to affect the quality of education given to mothers and ability to provide hands-on activities – perceived as needed for successful education in CF. Kavle et al (2018) reported that counseling mothers on maternal diet, the harms of low nutrient and processed foods is critical, yet often missing from programs in Egypt (45). Discrepancy in messages provided by different health care providers was noted highlighting the lack of standardization of disseminated messages. In fact, key informants stressed on the need for capacity building especially in relation to counselling.

*"Nurse is willing to do it but didn't know what to say"* (Key informant - Egypt)

*"Mothers usually ask for a schedule with quantities, however pediatricians do NOT know, they don't have the expertise, they need to refer to the specialist / dietitian, and they don't"* (Key informant – Lebanon).

Furthermore, the lack of time and prioritization of providing counselling and education on CF was reported in Oman, Lebanon and Jordan. This overload was linked to insufficient staff. Turn-over of staff and low salary of staff was also noted in Sudan as well as budget shortages within the primary health care system across countries.

Gaps in specialized nutritionists were highlighted in Oman, Egypt, and Lebanon. Nutritionists or dietitians were perceived to focus mainly on non-communicable diseases and obesity and less so on issues related to malnutrition or IYCF. Presence of nutritionists at the primary health clinics was noted in Oman however mainly focusing on treatment of anemia, acute malnutrition, and NCDs.

Al Nuaimi et al (2017) reported on factors affecting breastfeeding duration in GCC including in Oman. Healthcare-related factors (e.g. a lack of well-trained specialists to provide breastfeeding support to new mothers) were contributing factors to a higher rate and longer duration of breastfeeding (46). In Oman, breastfeeding practices have been reported to be affected by the lack of continuity of support, inadequate healthcare staff training/education (46).

At the primary health care level, gaps in reporting on activities and monitoring of the quality of services were noted in Oman, Egypt, Sudan, and Lebanon as contributors to suboptimal counseling/education.

Community-based interventions, such as outreach and education at the household level by community health workers or at community centers via support groups, existed at varying scales. However, these lacked institutionalization and scale up. Interviewees highlighted consistently the importance of such interventions and their impact on improving feeding practices however emphasized that these are often dependent on funding and lack sustainability especially in what relates to community health volunteers.

Abdel-Aziz et al (2015) showed that community-based interventions and the engagement of CHWs had a positive impact on mother's knowledge and practices related to child sickness in Egypt, thus the importance of supporting such initiatives (57). Brasington et al (2016) suggested a significant dose-response relationship between exposure to community-based programming via civil societies and CHW and knowledge and behavioral indicators amongst mothers, especially in Upper Egypt (58).

In Lebanon, challenges and barriers for complementary feeding including the lack of integration of IYCF programs within PHCs and organization are also reported (59).

4.3.2.2 Access to health and community services

The shortages in availability of services is compounded by lack of access to services. The percentage of families and mothers accessing health services differed between countries. In Oman access is high with the majority of the population accessing public health services. Whereas in Sudan it is very low. At the same time, in Lebanon a high percentage of families access private health care and only families with low socioeconomic status and refugees access public health services. Therefore, although some services do exist at the primary health care level, however access to these services remains a gap. The gap also exists between private and public health facilities such as in Lebanon where the messages and quality of services differ between the two affecting the consistency and quality of services related to complementary feeding.

**“Information is not reaching mothers before they are pregnant”** (Key informant – Oman)

In Sudan, there is a high reliance on community support and outreach. Most of the messaging on IYCF occurs at the community level and via established mother support. A recent KAP survey reported that almost a third of mothers relied on their own knowledge and only one in ten mothers received information from health staff (40).

Specifically for Sudan, security concerns and issues as well as the unique difficult terrain was noted to hinder implementation of behavior change interventions.

Analysis of household surveys showed a significant association between receiving ANC and diet diversity in Sudan and minimal meal frequency in Egypt but no significance is seen in the other countries. (Table 11). It may be that accessing ANC contributes to improved knowledge or this association may be confounded by maternal education or SES which were not controlled for in this analysis.

Table 11 - Odds of child intake of minimum diet diversity, minimum meal frequency and minimum acceptable diet by receipt of antenatal care in Sudan, Egypt, State of Palestine and Jordan (OR %95CI).

	Sudan		Egypt		State of Palestine		Jordan	
	OR (95%CI)	P value	OR (95%CI)	P value	OR (95%CI)	P value	OR (95%CI)	P value
MDD (all children 6-23 months)								
Received antenatal care								
No	Ref		Ref		Ref		Ref	
Yes	1.87 (1.45;2.40)	***	1.03 (0.82;1.31)		0.86 (0.21;3.53)		1.20 (0.52;2.76)	
Number of antenatal care visits								
< 4 visits	Ref		Ref		Ref		Ref	
4+ visits	1.70 (1.37;2.11)	***	1.17 (0.98;1.40)		1.47 (0.89;2.42)		1.31 (0.84;2.06)	
MMF (all children 6-23 months)								
Received antenatal care								
No	Ref		Ref		Ref		Ref	
Yes	1.06 (0.84;1.34)		1.41 (1.12;1.78)	**	1.06 (0.21;5.20)		1.21 (0.52;2.85)	
Number of antenatal care visits								
< 4 visits	Ref		Ref		Ref		Ref	
4+ visits	1.02 (0.83;1.26)		1.31 (1.09;1.57)	**	1.15 (0.62;2.10)		1.33 (0.84;2.10)	
MAD (all children 6-23 months)								
Received antenatal care								
No	Ref		Ref		Ref		Ref	
Yes	1.55 (1.13;2.13)	**	1.26 (0.95;1.68)		1.32 (0.34;5.00)		1.19 (0.42;3.36)	
Number of antenatal care visits								
< 4 visits	Ref		Ref		Ref		Ref	
4+ visits	1.25 (0.95;1.63)		1.32 (1.06;1.65)	*	1.47 (0.86;2.50)		1.35 (0.76;2.41)	

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

Specific interventions in certain areas have been reported to show positive impact. Boxes 1, 2, & 3 are examples from Oman, Sudan, and Egypt.

**Box 1. Oman as an example of a government led initiative**

In Oman, provision of services related to complementary feeding occurs through the primary health care centers which are led by the government. The majority of families in Oman access public primary health services and the government has incorporated IYCF activities within that system. An IYCF policy has been established and disseminated to all health centers which includes in addition to breastfeeding recommendations, guidance on complementary feeding. Within each center, pregnant women are welcomed into a comprehensive ANC/PNC program where the mother receives the necessary services. In terms of education on complementary feeding, the mother can receive messages via different outlets: a) via the doctor who provides some guidance on complementary feeding, b) via the nurse who is vaccinating, or c) via the dietitian. To note however that this was not consistent throughout the centers or the mothers. In addition, educational material has been developed on breastfeeding but not fully on complementary feeding (see appendix J). Another outlet through which mothers can receive education and awareness is via the health educators who are at the health care center and community level. Although these educator or health promoters are not yet mandated to provide education on nutrition (there was conflicting information on whether they do or not), they do show a potential venue to build on and provide the necessary information and support to mothers at the community level. Another potential outlet to build on are the existing nutritionists in the centers. Although not present in all centers, however clear and unified messages on complementary feeding can be disseminated consistently via the nutritionists who are able to see mothers coming to visit the center when their infants are almost 6 months or more.

The program in Oman is an example of a government led initiative where the majority of the intervention is led centrally by the Ministry of Health and then disseminated at the regional level. For the improvement of CF in Oman, existing outlets can be built on in order to implement a comprehensive behavior change intervention.

**Box 2. Egypt as Nutrition sensitive interventions**

In Egypt, IFPRI has documented the impact of a long term agricultural intervention on nutrition via a smallholder farm household survey that was conducted in six governorates in Upper Egypt (54). The agriculture intervention encompasses providing support to farmers to improve agricultural production. It also includes providing awareness about nutrition and diet diversity.

The survey showed that, similar to findings from the household surveys, smallholder farm households in higher expenditure quintiles have higher household dietary diversity scores than those in lower quintiles. At the same time, households that are better-off spend more on food from food groups with higher nutritional value, such as animal-source foods, fruits, and vegetables. These findings imply that increasing farm income may have a significant potential for improving diets. However, it also means that non-agriculture interventions are needed for both farmers and non-farmers to increase income. The survey showed that in order to achieve positive impact on people’s diet or nutritional status, interventions should go beyond income and price channels, but should include education and behavioral change communication activities, including on themes related to dietary diversity. For such activities to be effective, it is important to consider and adapt to the low literacy level of target population.

**Box 3. Sudan as a community based intervention**

A nutrition program that was observed in Sudan, is the nutrition impact and positive practice (NIPP) program implemented by GOAL. This program adopts a grass-roots approach to address underlying causes of malnutrition for both affected and at-risk individuals. The approach supports the community, both men and women leaders, in practicing positive behaviors that incorporate health, water sanitation and hygiene as well as livelihoods activities. It includes establishing community circles where members gather, for a duration of 12 weeks, to gain knowledge and skills enabling them to adopt positive practices and use locally available resources towards nutrition security at their household. Circle gatherings include awareness sessions on malnutrition and related topics, micro-gardening activities, as well as participatory cooking demonstrations. According to GOAL field teams in Sudan, the NIPP approach has had a very positive impact on nutrition-specific and sensitive behaviors in Sudan reflected in figures between 2013 and 2017, showing increased food diversity in children 6-23 months of age and increased numbers of MAM-cured children 6-59 months of age as well as pregnant and lactating women. GOAL team strongly believes in the NIPP approach as being the new direction of malnutrition programs because it offers long-term sustainable solution to malnutrition in the context of Sudan, where diversity between localities is big, food insecurity is often times jeopardized and poverty and illiteracy reign. It would be worth further looking into this intervention and considering scaling up and expanding in the country.

## 4.4 Policy Environment and determinants of CF at the policy level

National IYCF policies exist in Lebanon, Oman, and Jordan as a stand-alone document whereas it is integrated in a nutrition policy in Sudan and SoP and lacking in Egypt. Most existing policies have provisions for complementary feeding, however they differ in their terminology. For example, in Lebanon the policy calls for adequate complementary feeding without referring to diversity. Other legal documents that exist and include provisions for complementary feeding include the nutrition policy (in Oman and SoP), national nutrition or IYCF strategies in Oman and Sudan, the Baby-Friendly Hospital Initiative in SoP and Jordan, Child Law in Sudan and SoP, and the strategy for agriculture in Egypt. Although such policies exist, they differ in terms of content and the extent to which they are endorsed, disseminated and implemented (Appendix C). In Oman, the IYCF policy was seen hung on the wall in the PHC. In other countries such as Lebanon, gaps have been documented in the dissemination and implementation of Law 47/2008 (59, 60).

Although all countries have some form of legal document for the enforcement of the Code of Marketing of Breast-Milk Substitutes and subsequent resolution (the Code), these differ in the extent to which they are legally legislated and in line with the Code. Based on WHO Code Status Report (72), Lebanon is reported as having "full provisions," Egypt as "many provisions in law," and Oman, Sudan, and Jordan as "few provisions in law." Based on the perceptions of key informants, laws in Sudan and Egypt still need to be updated and legislated. The law in Jordan is being enacted and it is also in the process of being legislated in Oman. In Lebanon, work is underway to develop legal decrees that would facilitate implementation. Implementation of these laws have been reported to face challenges with violations being reported in different countries. For example, in Lebanon complementary food products, meant to be sold in pharmacies, are still being sold in supermarkets and are readily available and marketed.

Key informants reported on the lack of political will and prioritization for nutrition and complementary feeding at the government level but also within some UN agencies.

### 4.4.1 Determinants of Complementary Feeding at the Policy Level (Social Protection)

The role of existing policies on marketing of breastmilk substitutes (BMS) in shaping complementary feeding practices has been raised by key informants in Lebanon and SoP. Participants emphasized how the lack of control over marketing of complementary feeding products could affect mother's behavior in terms of what to feed her child. In Oman, breastfeeding practices have been reported to be affected by increased marketing of infant formula (46). The table below presents status of legislation of the Code in each of the countries and MDD in countries with poor legislation, DDS are less which may give an indication of some form of linkages between marketing policies and feeding practices.

	Egypt	Jordan	Lebanon	Oman	SoP	Sudan
<b>Code Legislation Perception</b>	Poor legislation	In process	In place	In process	In place	Poor legislation
<b>Code Legislation Reporting (72)</b>	Many provisions in law	Few provisions in law	Full provisions in law	Few provisions in law	No data	Few provisions in law
<b>DDS</b>	43.2% (DHS 2014)	51.4% (DHS 2017)	N/A (15% Syrian refugees – VASyr 2017)	80.7% (NNS 2017)	62.6% (MICS 2014)	28% (MICS 2014)

Another main policy that was highlighted was the maternity protection policy. Participants agreed that short maternity leaves contribute to challenges in feeding practices. This relation between maternity leave and breastfeeding has been previously established (61). Al-tamimi et al (2016) reported that 30% of a sample of mothers in al Karak in Jordan attributed premature cessation of breastfeeding to work (62).

Particularly in Egypt, policies related to food assistance have been highlighted by participants. In a study conducted by IFRPI, it was shown that existing policies related to the food ration-card program contributed to incentivizing the overconsumption of calorie-rich and unbalanced diets especially among the urban population. It seems that the large food subsidy system may have contributed to aggravating the double burden of malnutrition given that it was mainly high calorie, low nutritional value food that were subsidized. The report also highlighted the impact on household diet diversity which may have implications on child nutrition indicators (63).

Policies related to restricting marketing of foods & beverages to children were mentioned by key informants in the context of ensuring standards. Based on the WHO NCD Progress Monitor report for 2017, only Jordan has fully achieved the WHO recommendations for restricting marketing of foods and non-alcoholic beverages to children (73).

## 4.5 Key informants' recommendations to Improve Complementary Feeding

In order to address gaps related to improving complementary feeding practices key recommendations were provided by key informants. The following are the main themes that emerged from the key informant interviews at the central and policy level, and program and service provision levels. These were perceived to contribute to improving two main outcomes emphasized as needing to be addressed 1) improving knowledge and skills of mothers and 2) addressing poverty. Recommendations as well as observations and findings from this landscape analysis were compiled in a schematic theory of change (Figure 16 and Appendix K).

### 4.5.1 Recommendations at the policy/central level

#### 4.5.1.1 Coordination and collaboration between actors.

On several occasions, key informants highlighted the need for improved coordination and collaboration amongst actors including UN agencies, NGOs, and government entities. This is to address gaps in coordination related to programming. The importance of ensuring the pooling of efforts and resources in order to maximize impact was highlighted. Particularly in Egypt and Lebanon, given the identified duplicity of messages in CF, key informants emphasized the need to address conflicting recommendations in CF and the unification of guidance at the national level as well as the source of guidance used.

#### 4.5.1.2 Leadership and prioritization of nutrition and complementary feeding

In line with the above recommendation, key informants emphasized the need to ensure prioritization and political will for improving nutrition at the national level. They recommended implementing advocacy initiatives targeting government institutions and other key entities (such as syndicators in Lebanon) in order to ensure prioritization. In the case of Egypt where national strategies are lacking, informants highlighted the importance of ensuring leadership and interest in developing and implementing well thought child nutrition strategies.

#### 4.5.1.3 Ensure development and implementation of relevant policies

Ensuring the implementation and enforcement of the WHO Code was noted by key informants in countries where there is a gap in implementation or legislation (Lebanon, Oman, Egypt) and in view of the perceived effect of marketing of CF products on feeding practices. Recommendations to ensure that provisions include those related to complementary feeding were highlighted.

Other policies that were recommended to be developed or enforced were the maternity protection policy and policies that would improve the quality of food given to children. In addition, recommendations to address nutrition standards in nurseries and childcare centers were noted in Lebanon and Oman.

#### 4.5.1.4 Strengthening health systems

A key recommendation that emerged from key informants is the importance of strengthening health systems at the primary level and ensuring the integration of IYCF including CF services. This is to address the lack of prioritization of counselling and education on CF to mothers by health care providers. Recommendations also included the importance of giving incentives to staff particularly in Sudan including improve employment wages to decrease turnover and retain staff.

### 4.5.2 Recommendations at the program and service provision level

#### 4.5.2.1 Conduct assessments that consider cultural and geographic disparities

In order to address the prevalent cultural and geographic disparities, key informants highlighted the importance of conducting in-depth assessments at the regional level. This will help identify specific needs and tailor programs and messages to each community based on its specificity. Key informants also noted the importance of adopting a bottom-up approach to identify needs and engage communities.

#### 4.5.2.2 Implement a comprehensive behavior change and communication intervention

One of the main and cross-cutting themes that emerged is the importance of implementing a comprehensive and effective behavior change and communication intervention. Key informants identified the main drivers for the success of such an intervention including:

- Engaging family members in addition to mothers such as grandmothers, fathers, and other caretakers.
- Ensuring access to information via primary health facilities as well as at the community level addressing misconceptions and taboos.

- Implementing creative community based interactive activities that use hands-on activities such as cooking and food demonstrations of local available foods as well as food storage and preservation techniques as a way to raise awareness.
- Considering the engagement of community leaders in nutrition promotion such as teachers, religious leaders, and other community outlets. In Sudan, the traditional song (hakamat) was suggested to be used.
- Using up-to-date, easy to read educational material and ensuring the unification of messages amongst different health care providers (doctors, nurses, midwives, dietitians, community health workers) to overcome discrepancies and confusion. Particularly for Egypt and Lebanon, ensuring educational materials are unified.
- Building on existing community support and community health volunteers in order to scale up interventions and providing incentive and motivation in order to retain these community health volunteers.
- Ensuring messages include both breastfeeding and complementary feeding in equal importance and continue to provide breastfeeding education in order to overcome barriers related to lack of breastfeeding affecting CF practices.
- Considering using social media and other media outlets.
- In addition to complementary feeding, including relevant key messages related to family planning and early marriage to address gaps in age of marriage.

Regardless of the modality of the intervention, key informants highlighted the importance of data collection and monitoring and evaluation. This is to address gaps in data identified in most of the countries.

4.5.2.3 Increase access to quality counseling and education services

In order to address gaps at the primary health and community levels in relation to knowledge and skills of health care providers, key informants recommended the implementation of capacity building interventions targeting them (including doctors, nurses, midwives, and community health workers). Despite the existing training initiatives that have been mentioned in all of the countries, it was apparent that there is a need to continuously build capacity on IYCF in general and on CF in particular. In fact, local evidence is available on the impact of such interventions where in Egypt, El-Sayed et al (2014) in a single-blinded randomized-controlled study showed evidence of how the implementation of the WHO Complementary Feeding Training Course improved physicians' performance, as well as mothers' feeding knowledge reported practices, and growth of children (64). In addition, recommendation to consider reviewing university curricula to ensure that the appropriate IYCF and CF messages are integrated was noted. In addition to increased access to counselling and education on IYCF, improving access to ANC and PNC services as well as ensuring care for mothers was emphasized especially in Egypt.

4.5.2.4 Increase access to fruits, vegetables and meat

In order to address gaps in access to fresh fruits and vegetables, key informants recommended the importance of improving household income and implementing interventions that increase availability of food. Agricultural programs and food voucher programs such as the Takafol program were mentioned in Egypt, which consisted of providing cash to poor families with children under 18. Such interventions have been reported to show an improvement in diet diversity amongst households receiving assistance (65).

4.5.2.5 Other recommendations

Other recommendations included the importance of assessing the situation related to iron fortification and addressing relevant gaps. Given the lack of progress and milk improvement in iron deficiency anemia, key informants emphasized the need for further investigation in what relates to Iron fortification at the national level. It was recommended that fortification be evaluated and gaps addressed within each country.

## 4.6 Theory of Change

As a result of this Landscape Analysis and the review of programs, policies as well the findings from the key informants' interviews and field visits, a schematic theory of change was developed that illustrates the components including actions, outputs, outcomes, and impact related to improving complementary feeding practices. Figure 16 below is the schematic presentation of the theory of change. Appendix K also includes the theory of change that can be examined separately. To note that the theory of change represents different components and recommendations that need to be tailored to each country since some actions may for example be less relevant for a country than to another.

### THEORY OF CHANGE - IMPROVING COMPLEMENTARY FEEDING IN THE MENA REGION

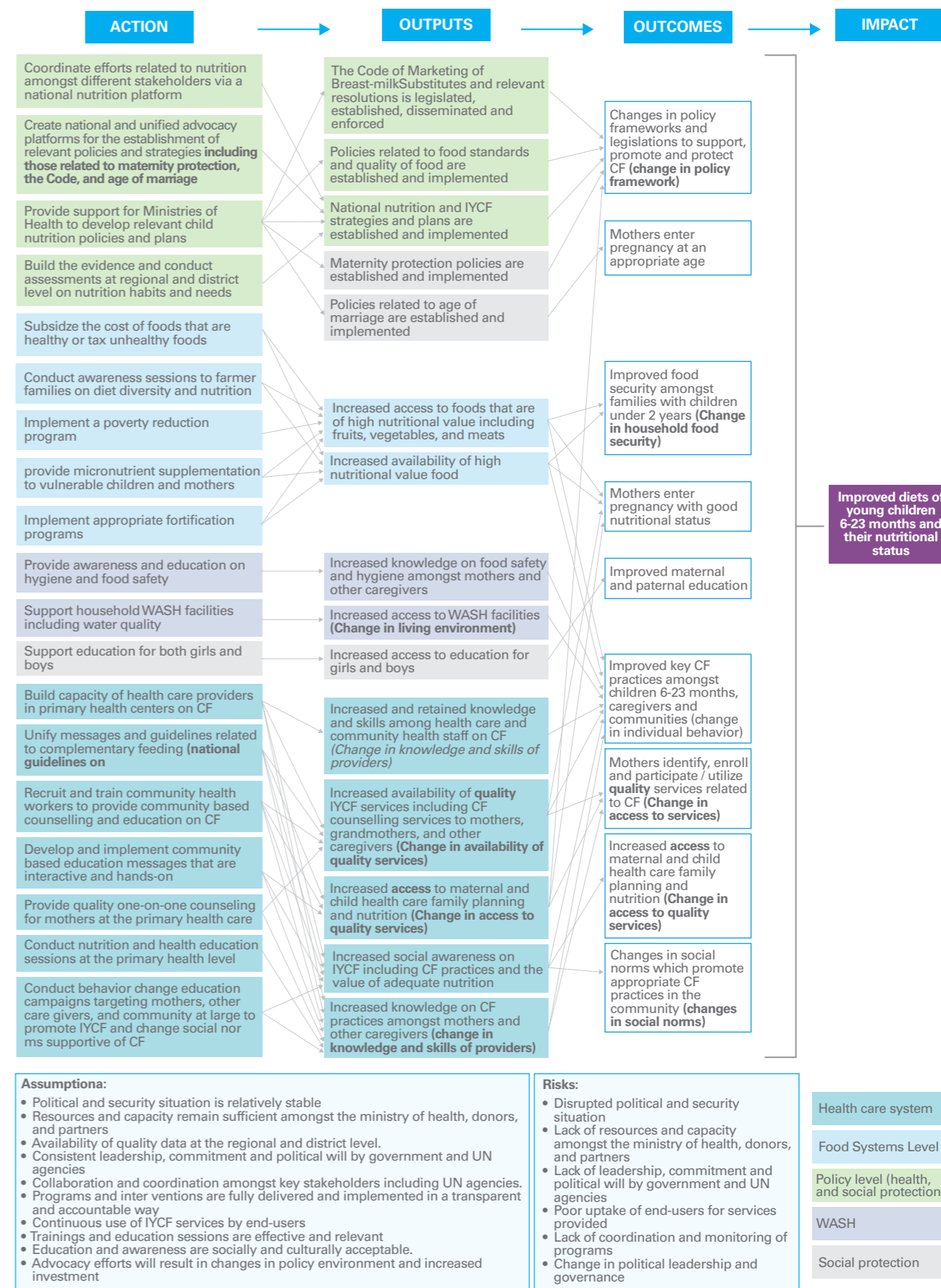


Figure 16 - Theory of Change for Improving Complementary Feeding in the MENA Region



## 5. Conclusion

This landscape analysis confirms gaps in complementary feeding practices across the studied countries; Egypt, Jordan, Lebanon, Oman, Sudan and SoP; and highlights the need for further investigation at the country and sub-country level including further in-depth analysis. There is a need to ensure that needs and gaps are further identified within countries in order to tailor interventions and mode of implementation.

The study also confirms the need to ensure unity, coordination, leadership, and prioritization at the central and government level. This is needed to ensure continuity and sustainability. Advocacy and support to governments within countries is needed in order to move the nutrition agenda forward and specifically complementary feeding.

The landscape analysis shows that complementary feeding practices may have determinants that are at different levels including individual, household, and system level. Therefore, it implies that there is a need for inter-sectoral comprehensive interventions that address determinants of complementary feeding at multiple levels.



## 6. References

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## 7. Appendices

- 7.1 Appendix A: List of documents retrieved
- 7.2 Appendix B: Country profiles
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