

FOOD AND NUTRITION PROFILE

THE HASHEMITE KINGDOM OF JORDAN 2011



Source: [JPFHS 2007]

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A fact sheet summarizing this food and nutrition profile is available at http://www.fao.org/ag/agn/nutrition/profiles_by_country_en.stm#neareast

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Acronyms	
AARDO	Afro-Asian Rural Development Organization
BCG	Bacille Calmette–Guérin
BFHI	Baby Friendly Hospital Initiative
BMI	Body mass index
CED	Chronic energy deficiency
CFS	Committee on World Food Security
DAPID	Department of Agricultural Policies and International Directorate
DES	Dietary energy supply
DoS	Department of Statistics
DPT3	Diphtheria, Pertussis (whooping cough) and Tetanus vaccine – three doses
DRI	Daily Recommended Intake
EMRO	Eastern Mediterranean Regional Office (of the World Health Organization)
FAO	Food and Agriculture Organization of the United Nations
FAOSTAT	FAO Statistical databases
FEWSNET	Famine Early Warning Systems Network
FIVIMS	Food Insecurity and Vulnerability Information and Mapping Systems
GDP	Gross domestic product
GIEWS	Global Information and Early Warning System
GoJ	Government of the Hashemite Kingdom of Jordan
HDI	Human development index
HEIS	Household Expenditure and Income Survey
HIV/AIDS	Human immunodeficiency virus/Acquired immunodeficiency syndrome
ICCIDD	International Council for the Control of Iodine Deficiency Disorders
IDA	Iron deficiency anemia
IDD	Iodine deficiency disorders
IDR	Import dependency ratio
IFAD	International Fund for Agriculture Development
IFPRI	International Food Policy Research Institute
ILO	International Labour Office
IYCF	Infant and young child feeding
JAAH	Jordanian Alliance Against Hunger
JPFHS	Jordan Population and Family Health Survey
LBW	Low birth weight
MICS	Multiple Indicator Cluster Survey
MoE	Ministry of Education
MoH	Ministry of Health
MPIC	Ministry of Planning and International Cooperation
NCFA	National Council for Family Affairs
OKH	Office of the King Hussein
ORT	Oral rehydration therapy
PPP	Purchase power parity
RSW	Regional Surveys of the World
UN	United Nations
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations Children's Fund
UNIDO	United Nations Industrial Development Organization
UNPD	United Nations Population Division
UNSTAT	United Nations Statistics Division
USAID	United States Agency for International Development
VAD	Vitamin A deficiency
WB	World Bank
WFP	World Food Programme
WHO	World Health Organization

I: Food supply and consumption

I.1 Description and analysis of food consumption

Food consumption patterns

In Jordan, the staple foods are wheat and rice. *Khobez*, a leavened flat bread (pita bread) is consumed daily with most meals and often used to scoop other foods. Vegetables such as tomatoes, cucumbers, lettuce, bell peppers, green beans, okra, cauliflower, eggplants, spinach and summer squash occupy an important place in the diet; they are cooked with rice or as stew or are consumed raw as a salad. Yogurt is used in some dishes. Consumption of fruit (apples, oranges, bananas, grapes, figs, watermelons, apricots and peaches) varies according to season.

There are three main meals during the day. The traditional breakfast consists of fried eggs, *labaneh* (drained yoghurt), cheese, *hummus*, *falafel*, *zaatar* (thyme with sesame seeds, salt and a condiment called *sumak*), olive oil and some fresh vegetables such as tomatoes and cucumbers along with bread and a cup of tea. Lunch is the main meal, but due to urbanization and changes in working hours, lunches bringing all family members together become scarce (except on Fridays and holidays). It is even becoming common to skip lunch and have only a heavy meal at dinner time. A typical meal generally consists of a main dish made of rice, meat (mainly chicken, beef or lamb) and cooked vegetables accompanied by small side dishes. The most popular Jordanian main dish is *mansaf* – lamb cooked in dried yoghurt called *jameed* and served with rice. *Maklobeh* (rice cooked with fried eggplants or cauliflower and chicken or lamb) is also a common dish. *Hummus*, *motabal*, *tabouli*¹ and dishes made of yogurt and salad are typical small side dishes accompanying the main dish especially at lunch and dinner. Dinner is generally similar to breakfast or it could consist of a sandwich of *falafel*, *chawerma* or beef burger with tea or soft drinks. *Chawerma* (pita bread filled with grilled chicken or lamb) or *falafel* sandwiches (pita bread sandwich filled with a mix of deep-fried chickpeas, spices, and parsley) are eaten as quick meals or light snacks. Black tea, the national drink of Jordan, is consumed mainly at breakfast or dinner and after lunch.

Food consumption patterns do not much vary by governorates but they differ by place of residence. In urban areas, the diet is shifting towards a more westernized style. Many households take their meals away from home, the consumption of fast foods, ready-to-eat processed foods, rich in fat and salt, sweeteners and soft drinks is increasing. Due to the increasing number of working women, time often lacks to prepare a home cooked meal. Some dishes are considered incompatible with modern working life and are reserved for weekends and special occasions. In rural areas, the diet remains more traditional; households depend mainly on homemade foods and less on ready-to-eat foods. In these areas, meals mainly consist of cereals (bread, rice or both of them), cooked vegetables and meat or chicken. Yogurt usually accompanies lunch meals. Signs of the nutrition transition, currently ongoing in urban areas, also appear in rural areas (large consumption of sweeteners, double burden of malnutrition in preschool children, etc.).

When meals are eaten with friends and relatives, men and women eat separately. In these situations, men are traditionally offered food first. When only the immediate family is present, children and women are served first (Madanat et al., 2008).

Analysis of food consumption survey results

[\(Table A.1: Food consumption data\)](#)

The National Household Expenditure and Income Survey (HEIS) conducted in 2008 provides estimates of household food acquisition which are taken as proxies of consumption (DoS, 2009). Data on quantity and value of food products acquired by households were collected in four rounds of one week each, between March 2008 and February 2009. The sample included about 13 000 households [HEIS 2008].

Results from HEIS 2008 highlight the importance of cereals and fruit/vegetables in the diet: about 500 g of cereals/day were consumed per household member, mainly bread and rice. Consumption of fruit and vegetables² reached more than 400 g/person/day. This food group consists mainly of tomatoes, cucumbers,

¹ *Hummus* is a dip of pureed chickpeas with *tahini*, i.e. sesame seed paste, garlic and lemon juice; *motabal* is made of grilled eggplant with *tahini* paste; *tabouli* is a salad traditionally made of bulgur, tomato, cucumber, and finely chopped parsley and mint.

² Some fruit and vegetables (canned fruit and vegetables, lettuce, parsley mint) are not taken into account in the calculation as they are expressed in piece. Their quantity is however limited.

watermelon, banana, apple and orange. The mean daily consumption of meat (mainly poultry and lamb) was 150 g/capita/day which is high [HEIS 2008].

Consumption of fruit/vegetables, oil/fats, and fish/seafood was higher in urban areas than in rural areas while consumption of cereals was higher in rural areas. Consumption of meat was similar in both areas [HEIS 2008].

HEIS are conducted on a regular basis (approximately every 5 years). However, due to methodological issues, it is difficult to assess accurately trends in food consumption.

Households spent about 40% of their expenditure on foods [HEIS 2008], a share that has been rising since 2006 (33%) [HEIS 2006], probably as a result of the increase in food prices.

Analysis of dietary diversity survey results

No data on dietary diversity are currently available.

I.2 Food supply (FAO, FAOSTAT, 2011)

Supply of major food groups

Table 1: Trends in the supply of major food groups (in g/capita/day)

Food groups	Supply for human consumption in g/capita/day								
	1965-67	1970-72	1975-77	1980-82	1985-87	1990-92	1995-97	2000-02	2005-07
Fruit/vegetables	703	372	289	324	517	477	451	419	459
Cereals	349	414	418	432	428	457	443	407	439
Milk/milk products	119	144	163	203	212	203	155	167	211
Sweeteners	88	75	95	127	119	117	99	113	132
Meat/offals	24	42	49	79	111	92	90	100	108
Starchy roots	28	21	38	46	34	42	48	48	63
Vegetable oils	24	28	27	26	28	36	43	48	50
Pulses/nuts/oilcrops	34	29	31	48	42	41	32	51	46
Other	9	12	12	14	14	13	11	15	15
Fish/shellfish	4	4	7	9	13	9	13	12	15
Eggs	9	13	14	18	17	24	21	17	13
Animal fats	1	1	1	3	4	3	3	3	2

Fruit/vegetables, cereals and milk/milk products are the major food groups in terms of supply for human consumption. A huge decrease in the per capita supply of fruit/vegetables (tomatoes, cucumber, oranges, bananas, apples, etc.) was observed in the late 1960s, probably as a result of the loss of the West Bank (1967), which cut off some 80% of the fruit-growing area and 45% of the area under vegetables. Production of fruit/vegetables increased in the late 1970s, due in particular to a remarkable development in irrigated agriculture from the mid-1970s to the mid-1980s, and currently the per capita supply is rather high (RSW, 2004; DAPID, no date).

The per capita supply of cereals, which consists mainly of wheat and, to a much lesser extent of rice, has remained rather stable since the early 1980s. Within this food group, supply of rice tends to increase slightly over the period. The per capita supply of starchy roots (potatoes), albeit low, has more than doubled over the last four decades, due to various programmes implemented by the private sector and supported by the government providing access to land and water; imports have also increased.

A significant increase is observed in the per capita supply of foods of animal origin. That of milk/milk products almost doubled between 1965-67 and 2005-2007 and that of meat (mainly poultry meat) showed a four-fold increase over a 20-year period from 1965-67 to 1985-87; it has remained rather stable since. This significant increase in supply can be explained by an increased local production of meat (due to barley subsidization) and by increased imports of beef and poultry. The per capita supply of fish/shellfish is still low but it has also showed a large increase over the last four decades.

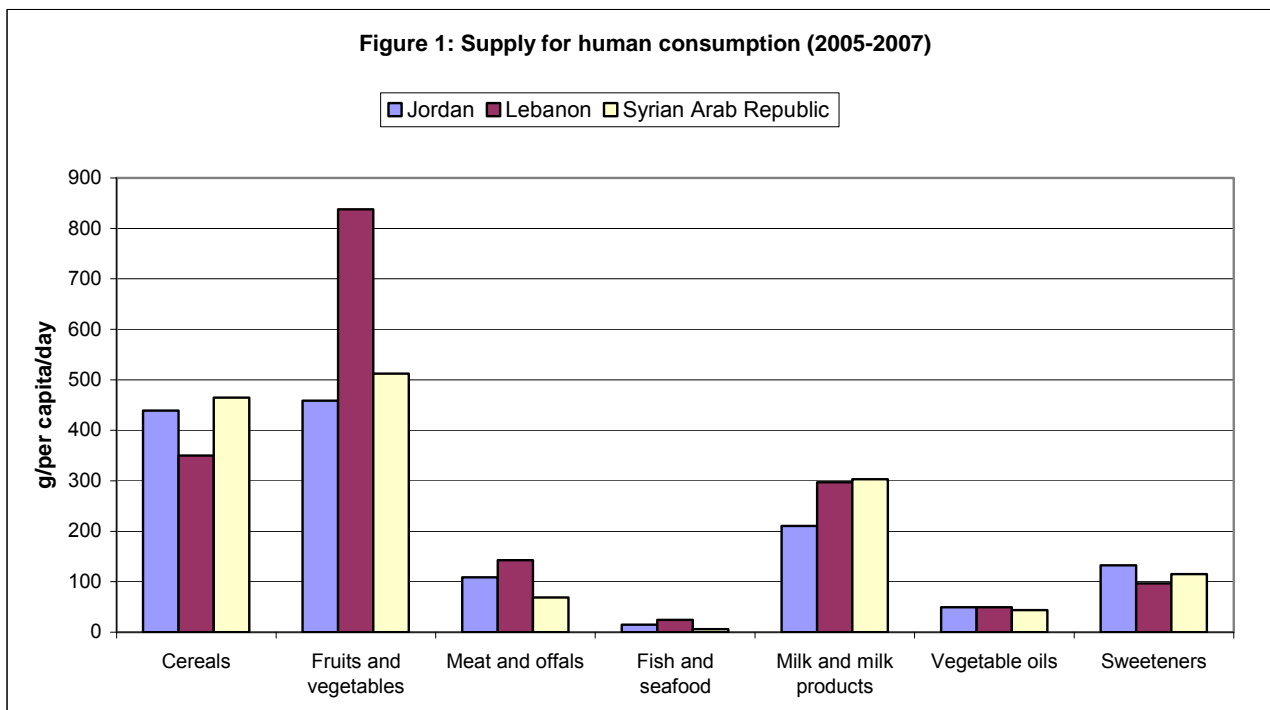
The per capita supply of sweeteners and vegetable oils increased considerably over the whole period. The per capita supply of olive oil (locally produced) has considerably decreased to the advantage of that of

imported soybean, sunflower and palm oil. These imported vegetable oils are widely used for cooking and are less expensive than olive oil, which accompanies salads and *zaatar*.

Food supply estimates are rather consistent with food consumption data.

The significant increase in foods of animal origin, vegetable oils and sweeteners in the supply since the 1960s reflects the nutrition transition in Jordan.

• Figure 1: Supply of major food groups in comparison with neighbouring countries



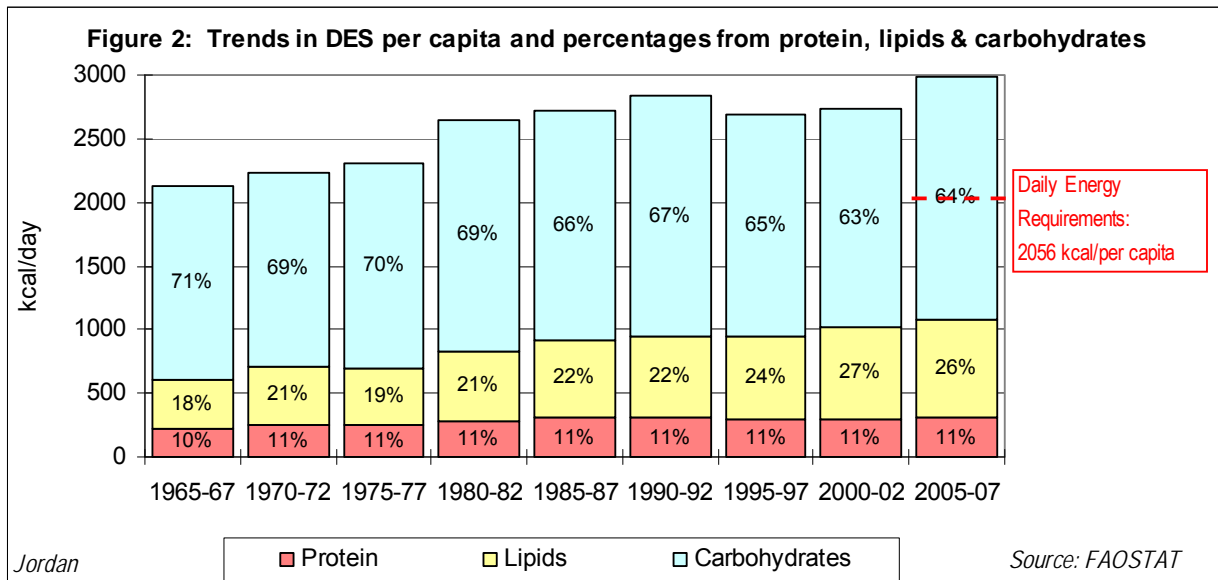
Per capita supply of fruit/vegetables, rather high in Jordan, is however lower than that in neighbouring countries, especially when compared to Lebanon where the supply is particularly high. Despite a large increase in the supply of milk/milk products supported by rising demand, the per capita supply of this food group is still lower in Jordan than in Lebanon and Syrian Arab Republic (Alqaisi et al., 2009).

Dietary energy supply, distribution by macronutrient

The dietary energy supply (DES) has increased quite steadily during the 40-year period considered to reach 2979 kcal/capita/day in 2005-2007, well above the population energy requirements of 2056 kcal/capita/day (FAO, 2004). The drop in the DES that occurred between 1995 and 2002 when compared to 1990-92 may be partially explained by a severe drought in 1999, when the wheat harvest met only 1% of domestic supply compared to more than 10% in 1992, a record year; increased imports were insufficient to offset this sharp drop.

The share of carbohydrates in the DES has consistently decreased to the benefit of that of lipids, which are currently close to the upper limit of recommendations (30%). These changes are mainly related to the increasing supply of vegetable oils, meat and milk/milk products. The share of protein in the DES has not increased since 1965-67 and remains at the lower limit of recommendations (10%); in absolute terms however protein supply rose due to the higher supply of milk/dairy products and meat (WHO/FAO, 2003).

• Figure 2: Dietary energy supply (DES), trends and distribution by macronutrient

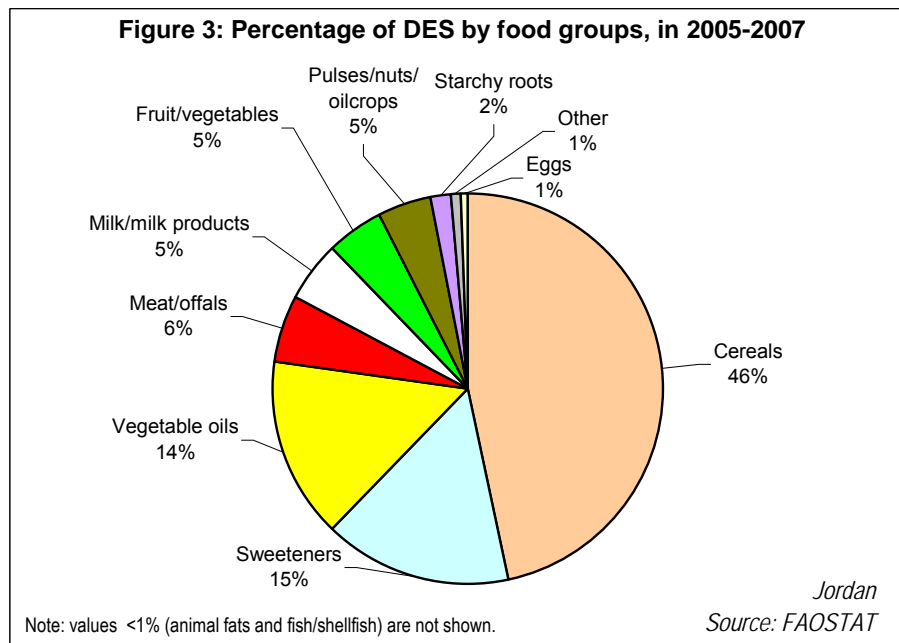


Vegetable/animal origin of macronutrients

The contribution of foods of animal origin to the energy (12%), protein (33%) and lipid (27%) supply is currently rather high (reference period 2005-2007) and the contribution of foods of animal origin to the protein supply has almost doubled since the 1960s.

Dietary energy supply by food group and dietary diversification index

• Figure 3: Dietary energy supply (DES) by food group



The percentage of DES provided by vegetable oils and, to a lesser extent, by meat/offals, has increased. On the other hand, the share of cereals and fruit/vegetables in the DES has declined over the last 40 years.

The food diversification index (share of foods other than cereals and starchy roots in the DES) has increased over the last four decades to reach 52% in 2005-2007. Dietary diversification has improved and is currently quite high. Nevertheless, it is worth noting that the contribution of vegetable oils and sweeteners in the DES (29%) is very important, the latter exceeding the upper limit of recommendations (10%) (WHO/FAO, 2003).

I.3 Origin of food supply

Characteristics of national food production

Jordan can be divided into four physiographic regions starting from the West and running from North to South: the Jordan Rift Valley which is the food bowl of Jordan for fruit and vegetables (Alqaisi et al., 2009), the Highlands where agriculture is mostly rainfed, the plains, and the Badia desert region in the east, which represents about 80% of the total country area (FAO, AQUASTAT, 2008). Jordan is one of the ten most water-poor countries in the world (IFAD, 2007). Only about 4% of the total land area is arable, mostly in the northwest and central areas; about 84% of this is rainfed and the rest is irrigated (UNDP, 2010a).

The major share of local agricultural production consists of fruit and vegetables (tomatoes, cucumber, citrus fruits, bananas, etc.), which is the production that receives the most support from the Government. Potatoes and olives are also produced in rather large quantities. Local production of cereals has decreased considerably since the early 1960s while that of starchy roots, animal products and fruit/vegetables has increased substantially over the same period (FAO, FAOSTAT, 2011). Smallholder agriculture still suffers from poor market linkages and limited marketing facilities (IFAD, 2007).

Livestock-keeping (mainly sheep and goats) is an important activity in the rainfed, semi-desert areas (IFAD, 2007). However, production of meat is limited, though the production of poultry is active. Local production of milk is not sufficient to meet local demand (FAO, FAOSTAT, 2011). The marine fishing industry in Jordan is small and artisanal, while aquaculture production is expanding (FAO, Fisheries and Aquaculture Department, no date).

Food imports and food aid

Jordan is dependent on food imports and thus particularly vulnerable to international food price shocks. The total food import bill has more than tripled between 1995 and 2008 (FAO, 2010).

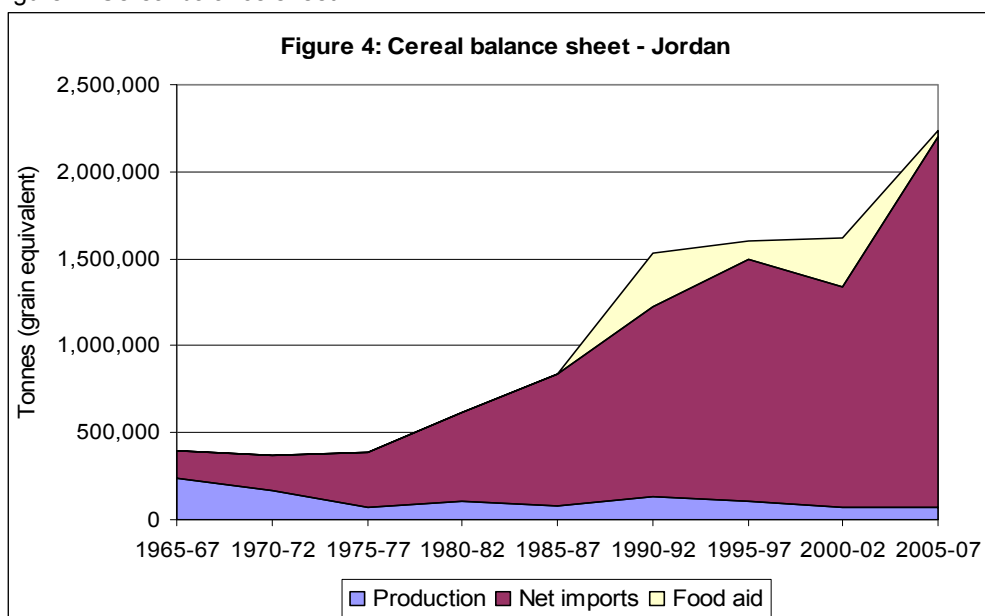
In 2005-2007, the major food groups imported for human consumption in terms of quantity were cereals (mainly wheat), sweeteners, milk/milk products and vegetable oils (mainly palm oil and soybean oil). The country's dependence on imports of cereals has gone up: the import dependency ratio³ (IDR) increased from 41% in 1965-67 to reach as much as 98% in 2005-2007 for this commodity (FAO, FAOSTAT, 2011). However, Jordan has a re-export activity of food products (towards the Gulf countries in particular) that makes the interpretation of the IDR difficult. Wheat import requirements for 2010-2011 were estimated at about 1 million tonne. The year before, the Government decided to raise strategic stocks from three to six months reserve as a precaution against future increases in food prices (FAO, 2011b). Jordan's fish demand is satisfied almost entirely by imports. The main food group exported in terms of quantity is vegetables (FAO, FAOSTAT, 2011).

Food aid is mainly received for Palestinian refugees (Personal Al-Hindi WFP communication). In 2005-2007, cereal food aid (grain equivalent) represented approximately 4% of the national cereal supply for human consumption (FAO, FAOSTAT, 2011; WFP, FAIS, 2011). However, food aid, and in particular cereal food aid, has decreased considerably since 2007 as food aid delivered as programme has stopped (WFP, FAIS, 2011). In 2009, Jordan received a total food aid of 4234 t, of which 374 t of cereals (mainly rice) and 3860 t of non-cereals (mainly sugar and vegetable oil). Almost all food aid (98%) was delivered as project food aid⁴ in 2009 (WFP, FAIS, 2011).

³ Import dependency ratio is defined as: $IDR = (\text{quantity imported} / (\text{quantity produced} + \text{quantity imported} - \text{quantity exported})) * 100$. It represents the share of domestic supply which comes from imports. IDR takes into account supply of food groups (quantity) whatever its utilization and not only what is destined to human consumption.

⁴ *Emergency* food aid is destined to victims of natural or man-made disasters; *Project* food aid aims at supporting specific poverty-alleviation and disaster-prevention activities; *Programme* food aid is usually supplied as a resource transfer for balance of payments or budgetary support activities. Unlike most of the food aid provided for project or emergency purposes, it is not targeted to specific beneficiary groups. It is sold on the open market, and provided either as a grant, or as a loan.

• Figure 4: Cereal balance sheet:



Sources: FAO, FAOSTAT, 2011; WFP, FAIS, 2011.

Note: food aid data for the period from 1965-67 to 1990-92 are not available and are thus included in imports.

I.4 Physical and economic access to food

It is likely that economic access to food is a concern for a significant part of the population. Despite a decrease in the incidence of poverty between 2002 and 2006, 13% of the population was still below the national poverty line in 2006. The incidence of poverty was higher in rural areas (19%) than in urban areas (12%). The governorates of Mafraq, Karak and Tafileh showed the highest incidence of poverty while Amman, Madaba and Irbid showed the lowest (WB and DoS, 2009).

In parallel, inflation has been high in the past decade (FEWSNET, 2011). The government responded to the recent hike in international food prices through increased subsidies on food and increase of food stocks, see Policies and programmes aiming to improve nutrition and food security (FEWSNET, 2011).

In 2008, WFP conducted the first food security survey at the household level in poverty areas⁵. Based on Food Consumption Score and food access indicators (income and expenditure), the survey revealed that 8% of households living in poverty areas were food insecure and 20% were vulnerable to food insecurity. In rural areas, food insecurity affected 11% of households, twice as much as in urban areas (5%). In response to the 2008 food price increase, many households living in these poverty pockets were forced to reduce the quantity (especially fruit, meat and dairy products) and the quality of food consumed (WFP and JAAH, 2008).

In conclusion, cereals (wheat in particular) and fruit/vegetables still occupy a prominent place in the Jordanian diet. The supply of food groups rich in high-value protein and essential micronutrients (milk/milk products, meat) has increased considerably, thus improving the quality and diversity of the diet. However, as a feature of the nutrition transition, the importance of sugar and vegetable oils in the diet has increased as well to reach the upper limit of recommendations. Changes in the structure of the diet towards an energy dense diet with a greater contribution of fat and reduced intakes of complex carbohydrates and dietary fibre, along with changes towards a more sedentary lifestyle, are the major factors contributing to the increasing prevalence of chronic non-communicable diseases (obesity, diabetes mellitus, cardiovascular disease, etc.) (WHO/FAO, 2003).

Local production of cereals is largely insufficient to meet demand and reliance on imports for this food group, as well as that of many other food products, is very heavy. Coupled with rising food prices on global food markets, this dependency raises the question of economic sustainability, in terms of both national capacities and of access of the population to a wide range of nutritious food products.

⁵ Poverty pockets in Jordan are identified as administrative areas where 25% of the people fall under the poverty line (defined by the Ministry of Planning).

II: Nutritional status and feeding practices of infants and young children

II.1 Infant and young child feeding practices

[\(Table A.2: Initiation and duration of breastfeeding\)](#)

[\(Table A.3: Adequate infant and young child feeding practices\)](#)

Infant and young child feeding practices are documented through four nationally representative Jordan Population and Family Health Surveys [JPFHS] that were conducted in 1990, 1997, 2002, and 2007 (DoS et al., 1992; DoS and Macro Int., 1998; DoS and ORC Macro, 2003; DoS and Macro Int. Inc, 2008).

In 2007, 93% of children born in the five years preceding the survey were breastfed but only 39% were put to the breast within one hour of birth (early initiation of breastfeeding) [JPFHS 2007]. The median duration of breastfeeding was 13 months which was stable over time [JPFHS 2007]. Between 1997 and 2002, the rate of exclusive breastfeeding for the first six months increased substantially (from 11% to 27%) but decreased to 22% in 2007 [JPFHS 1997, 2002 and 2007].

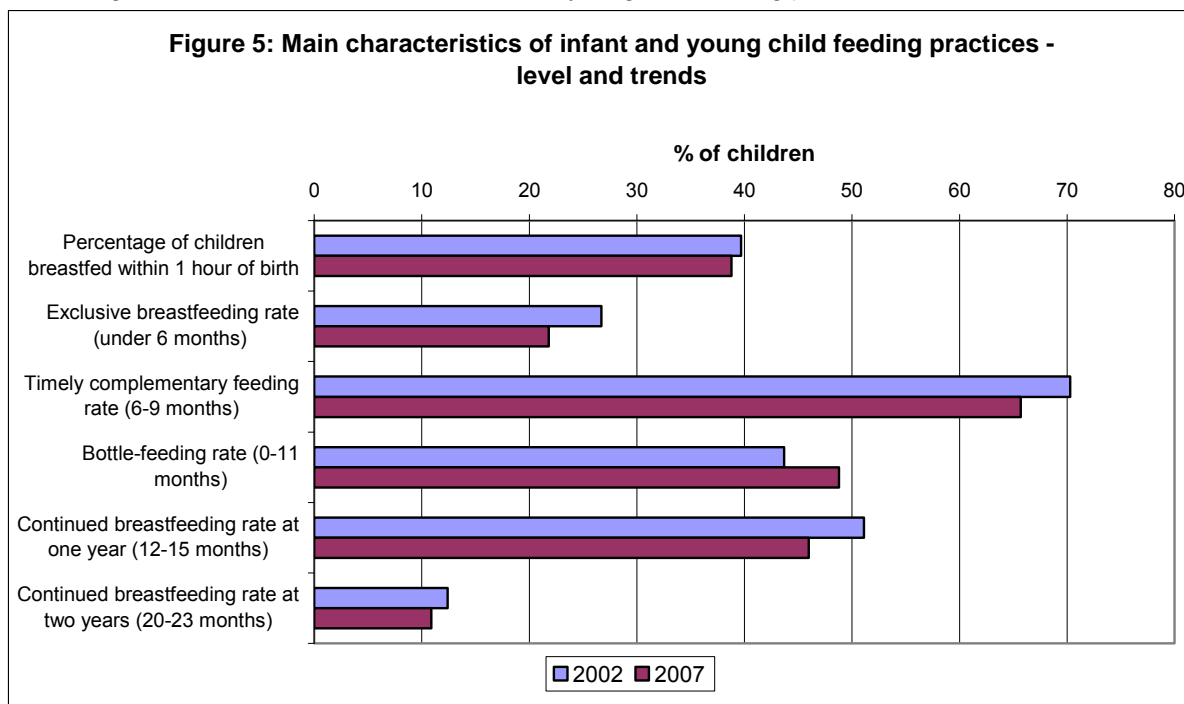
Breastfeeding, especially exclusive breastfeeding, has long been promoted, notably through the Baby Friendly Hospital Initiative (BFHI). Currently, there are only seven Baby Friendly Hospitals in Jordan. In 2004, the Ministry of Health established a breastfeeding unit in the Mother and Child Health Directorate to promote breastfeeding. The Directorate trained staff in most health centres and in some hospitals and produced informative material on breastfeeding and support groups for breastfeeding at centres and local communities were developed (UNICEF Press Centre, 2007).

Bottle-feeding practice tends to generalize; almost half of the children aged 0-11 months are bottle-fed, a proportion which has increased considerably since 1997 (30%) [JPFHS 1997, 2002 and 2007]. The increasing proportion of economically active women is probably an important determinant of the decline in exclusive breastfeeding practice and the spread of bottle-feeding⁶. Other possible determinants of the observed trends include lack of awareness on the importance of breastfeeding due to inadequate guidance by health professionals and limited outreach of awareness campaigns. On the other hand, the International Code of Marketing of Breastmilk Substitutes is not well endorsed (UNDP, 2010a).

More efforts are still needed to promote adequate young child feeding practices and to implement BFHI not only through hospitals, but also through Mother and Child Health Centres, which are widely disseminated on the territory, even in desert areas (MoH, 2009).

⁶ The government passed a law in 1995 to extend maternity leave from 8 weeks to 12 weeks. During the International Labour Organization (ILO) meeting, held in Geneva in June 2000, Jordan endorsed the convention on maternity protection to give mothers the right to have maternity leave for not less than fourteen weeks and to have nursing breaks when returning to work. However, its endorsement was not translated into action yet.

• Figure 5: Main characteristics of infant and young child feeding practices



Sources: [JPFHS 2002; JPFHS 2007]

[\(Table A.4: Consumption of complementary foods, and meal frequency by breastfeeding status and age\)](#)

Two thirds of children aged 6-9 months are given complementary food in addition to breastmilk [JPFHS 2007]. Complementary feeding of children 6-23 months is diversified but for many children, the frequency of meals is insufficient respectively to WHO recommendations (see table A.3) [JPFHS 2007].

Complementary feeding is diversified. It consists mainly of rice, accompanied by cooked vegetables, dairy products (pudding, yoghurt, *labneh*), starchy roots and vegetables (potatoes, carrots, peas), pulses (lentils or cooked chickpeas (*hummus*)) and meat (lamb and beef)/fish/eggs [JPFHS 2007, see table A.4]. Generally, children start eating from the family pot at age 10-12 months. No quantitative data on dietary intake of these food groups are available for young children. In the wealthiest households children may be given iron fortified cereals as complementary foods. Fruit juices and tea are also frequently given.

II.2 Anthropometry

Low birth weight (less than 2 500g)

Almost all new-borns are weighed at birth (99% in 2007). The prevalence of low birth weight was 11% in 2007, a prevalence which had remained stable over time [JPFHS 1997, 2002 and 2007]. Prematurity is probably the main determinant of the relative high prevalence of low birth weight.

Anthropometry of preschool children [\(Table A.5: Anthropometry of preschool children\)](#)

Four Jordan Population and Family Health Surveys (JPFHS), conducted in 1990, 1997, 2002, and 2009 (DoS and ICF Macro, 2010), document anthropometry of children under five years of age (0-4.99 years). The Micronutrient Survey 2010 also provides anthropometric data but the age-group is different (1-4.99 years) (MoH et al., 2011).

In 2010, the prevalence of stunting among children aged 1-4.99 years was 11%, that of wasting was 4%, and that of underweight was 3%. About 10% of these children were overweight and 2% were obese (defined with BMI-for-age).

Since the sample sizes for disaggregated estimates are not available in the 2010 survey and since the age-group is not standard, results from the 2009 survey are examined in more detail.

In 2009, the prevalence of stunting was 8% among children aged 0-4.99 years, which is low according to WHO classification. It was higher in rural areas (12%) than in urban areas (7%). At regional level, it was almost double in the South (13%) than in the Centre (7%) (9% in the North), which may be due to lower socioeconomic status overall in the South (JPFHS 2009; Abu Baker and Daradkeh, 2010). Large disparities were also observed by governorate: the prevalence of stunting ranged from 6% in Amman and Zarqa to 14% in Karak (where the incidence of poverty is high) and Ma'an⁷ [JPFHS 2009] (WB and DoS, 2009). The prevalence decreased with increasing mother's education level [JPFHS 2009].

The prevalence of stunting decreased considerably between 1990 (21%) and 1997 (11%) and slowed down to reach 8% in 2009. Over the whole period (1990-2009), the prevalence decreased 10 percentage points in urban areas and 17 percentage points in rural areas (see Figure 6) [JPFHS 1990, 1997, 2002, 2009]. This improvement might be put in relation with the overall development of the country (access to health services, to safe water and sanitation, etc.), the increased number of Maternal and Child Health centres and higher women's education level.

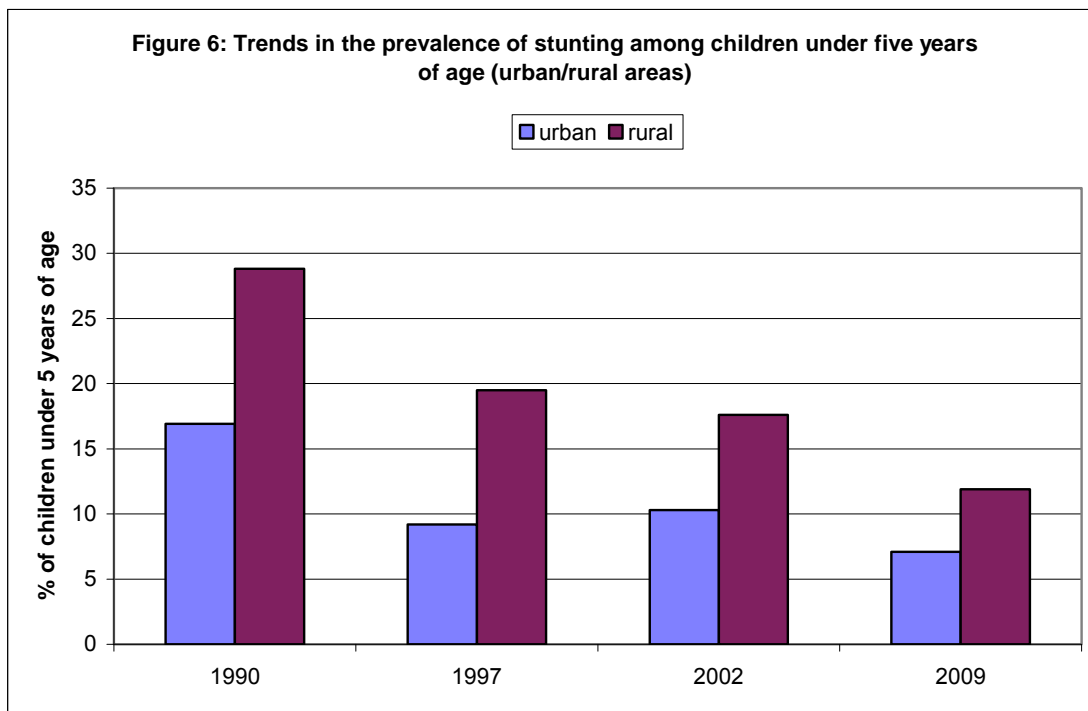
The prevalence of wasting and that of underweight were similar (2%) to what is observed in the reference population [JPFHS 2009].

In parallel, the prevalence of overweight almost doubled between 1997 (4%) and 2009 (7%) [JPFHS 1997, 2002, 2009]. The prevalence reported in the JPFHS 1990 (9%) is not consistent with the overall trend. Increasing prevalence of overweight in young children may be related to inadequate infant and young child feeding practices and to the nutrition transition: decline of exclusive breastfeeding until 6 months of age, common bottle-feeding, and widespread consumption of complementary foods made with oil, fat, butter, sugar, etc. are probably major contributing factors (together with reduced physical activity levels). In 2009, the prevalence of overweight was higher among boys than among girls (8% and 5% respectively). No differences were observed between urban and rural areas. The prevalence was higher in the South (10%) than in the North and Central regions (6%). The high prevalence of both stunting and overweight is particularly marked in the South region [JPFHS 2009].

Even if the prevalence of overweight among children under five years of age has been increasing, it remains considerably lower in Jordan than in some neighbouring countries (17% in Lebanon in 2004, 19% in Syria in 2006) (WHO Global database on child growth and malnutrition, 2011).

⁷ Prevalence to be interpreted with caution due to the small sample size in this governorate.

- Figure 6: Trends in the prevalence of stunting among children under five years of age, according to place of residence



Sources: JPFHS 1990; JPFHS 1997; JPFHS 2002; JPFHS 2009

II.3 Micronutrient status

Iodine deficiency disorders (IDD)

Prevalence of goitre and urinary iodine level among school-age children [\(Table A.6: Prevalence of goitre and level of urinary iodine in school-age children\)](#)

Three national surveys document IDD in Jordan:

- *Study of iodine deficiency in Jordan* conducted in 1993 (MoH et al., 1993)
- *Assessment of iodine deficiency status among Jordanian children after introduction of iodized salt* conducted in 2000 (MoH et al., 2000).
- *National survey to assess iodine deficiency disorders among school children in Jordan* conducted in 2010 (MoH and WHO, 2010a).

All these surveys include school-age children 8-10 years.

Considerable progress has been done to eliminate IDD: results from the 1993 baseline survey showed that the prevalence of goitre among school-age children was 38%, pointing out a severe public health problem (MoH et al., 1993). These results triggered the implementation of an IDD control programme, which started effectively in 1995 (ICCIDD, no date). The impact assessment of the IDD control programme performed in 2000 showed a slight decrease in the prevalence of goitre (34%) (MoH et al., 2000; WHO Database on iodine deficiency, 2011). In 2010, this prevalence was below the threshold of 5% (MoH and WHO, 2010a). However, IDD persist as a mild public health problem in the governorates of Amman, Balqa, Jarash, and Ma'an (MoH and WHO, 2010a).

It takes a long time for the prevalence of goitre to decrease after effective iodized salt consumption and median urinary iodine is the most sensitive indicator in determining impact (see next paragraph "Iodization of salt at household level").

Median urinary iodine, which was only 40 µg/L (indicative of moderate iodine deficiency) in 1993, increased to reach 154 µg/L in 2000 (optimal iodine intake), showing the positive impact of the IDD control programme (MoH et al., 1993; MoH et al., 2000; WHO Database on iodine deficiency, 2011). In 2000, a quarter of children still had insufficient iodine intake while 7% of children had an excessive intake with risk of adverse health consequences (MoH et al., 2000; WHO Database on iodine deficiency, 2011). In 2010, median

urinary iodine was estimated at 203 µg/L (MoH and WHO, 2010a); this level may pose a risk of more than adequate intake in the overall population. Salt iodine level should be carefully monitored to ensure compliance with international standards and avoid excessive iodine intake.

The recommendations from the 2010 IDD survey were:

- to comply with WHO recommendations regarding iodine content of salt (15-40 ppm instead of 40-60 ppm)
- to conduct another study on IDD in the whole population, including women of childbearing age (MoH and WHO, 2010a).

Iodization of salt at household level

[\(Table A.7: Iodization of salt at household level\)](#)

Consumption of adequately iodized salt is widespread: 96% of households used adequately iodized salt (≥15 ppm) in 2010, a proportion that increased by 10 percentage points since 2000. Disparities by governorate were small, except in Mafraq where only 87% of households used adequately iodized salt (MoH and WHO, 2010a).

Vitamin A deficiency (VAD)

Prevalence of clinical and sub-clinical vitamin A deficiency in preschool children

[\(Table A.8: Prevalence of sub-clinical vitamin A deficiency in children from 1 to 5 years\)](#)

Two national surveys document sub-clinical VAD among preschool children: the *National baseline survey on iron deficiency anemia and vitamin A deficiency* carried out in 2002 and the *Micronutrient survey* carried out in 2010 (MoH et al., 2002; MoH et al., 2011). Both surveys include children aged 12-59 months.

The prevalence of sub-clinical VAD among preschool children increased from 15% in 2002 to 18% in 2010, due to an increase in urban areas (from 15% to 19%), while the prevalence decreased in rural areas (MoH et al., 2002; MoH et al., 2011).

VAD persists as a moderate public health problem in Jordan: in 2010, the prevalence of low serum retinol (<20 µg/dL) was of 18% among preschool children. Boys were more affected than girls (21% and 16% respectively), as were children living in urban areas (19%) when compared to those living in rural areas (14%). In the North, where the prevalence reached 21%, VAD was a severe public health problem. In the South, the small sample size did not allow for an accurate assessment of the level of this deficiency (MoH et al., 2011). However, given the results of the 2002 survey, VAD is probably also widespread in this region (MoH et al., 2002).

A regional survey conducted in 2004 among Bedouin preschool children (5-66 months) living in small villages of North Badia showed that VAD was a severe public health problem among this population-group: a quarter of these preschool children has low level of serum retinol (<20 µg/dL) (Khatib and Elmadfa, 2009). Bedouin have lost their traditions as livestock-keepers. This fact, combined with increasing urbanization in the areas where they live, higher prices and living costs, high price of imported food commodities (such as powdered milk) has resulted in a decrease in consumption of milk/milk products, meat and fresh fruit and vegetables, leading to inadequate micronutrient intake (Khatib and Elmadfa, 2009).

Consumption of vitamin A-rich foods among preschool children

[\(Table A.9: Percentage of children who consumed foods rich in vitamin A and foods rich in bioavailable iron in the 24 hours preceding the survey\)](#)

According to the JPFHS 2007, 84% of children aged 6-35 months had consumed vitamin A-rich foods⁸ in the 24-hour preceding the survey. This proportion increased markedly with age and was higher in urban areas and in the Central region [JPFHS 2007], see table A.9. It should be noted that milk/dairy products (a food group rich in vitamin A that is widely consumed by young children) was not taken into account.

In view of the relative high prevalence of VAD among young children, it is likely that the consumption of vitamin A-rich foods, although widespread, is quantitatively low especially meat and eggs, which contain high amounts of preformed vitamin A. Diarrhoeal diseases may also contribute.

⁸ Includes meat, fish, poultry, eggs, carrots, red sweet potatoes, pumpkin, apricot, palm nuts, yellow melon, and green leafy vegetables.

Vitamin A supplementation of preschool children

[\(Table A.10: Vitamin A supplementation of children\)](#)

The Jordanian National Action Plan for Children (2004-2013) aims to reduce vitamin A deficiency among children under five from 15% to 5% (WHO/EMRO, 2006a) through the expansion of the vitamin A supplementation programme: high dose of vitamin A are provided to young children together with measles vaccination and then every 6 months.

The coverage of vitamin A supplementation in children is very low: in 2007, only 9% of children aged 6-59 months received vitamin A supplement in the six months preceding the survey. The coverage was extremely low in the North (5%) where VAD is a severe public health problem according to the results of the 2010 micronutrient survey [JPFHS 2007; MoH et al., 2011].

Iron deficiency anemia

Prevalence of anemia in preschool children

[\(Table A.11: Prevalence of anemia in preschool children\)](#)

Four national surveys document the prevalence of anemia in preschool children:

- the *National baseline survey on iron deficiency anemia and vitamin A deficiency* conducted in 2002 (MoH et al., 2002)
- JPFHS 2002 (DoS and ORC Macro, 2003)
- JPFHS 2009 (DoS and ICF Macro, 2010)
- Micronutrient survey 2010 (MoH et al., 2011).

The 2010 and 2002 surveys include children aged 12-59 months while the JPFHS 2002 and 2009 ones include children aged 6-59 months.

In 2010, iron deficiency (defined as low serum ferritin, which reflects depleted iron stores) affected 14% of children aged 12-59 months. The prevalence of anemia in preschool children was 17%; this prevalence indicates a mild public health problem. The prevalence of anemia was higher in rural areas (23%) than in urban areas (16%). Disparities by region cannot be assessed accurately due to the small sample size in the South. Only 5% of children suffered from iron deficiency anemia⁹, indicating that other causes (in addition to iron deficiency) are responsible for anemia in preschool children (MoH et al., 2011). It is therefore necessary to further explore other causes of anemia in order to implement an array of appropriate interventions (food-based approaches but also control of parasitic infections, etc.).

Due to differences in age-groups, trends are difficult to estimate accurately. When comparing data from the 2010 micronutrient survey with those of the 2002 baseline survey (children aged 12-59 months), the prevalence of anemia decreased slightly from 20% in 2002 to 17% in 2010. However, when comparing these set of data with JPFHS 2002 and 2009, there is a large difference in prevalence, even when taking into account the difference in age-group. According to JPFHS 2002 and 2009, the prevalence of anemia among children aged 6-59 months was about 33-34% and remained stable between these two surveys. Methodological issues may explain these inconsistencies.

Consumption of foods rich in bioavailable iron among preschool children

[\(Table A.9: Percentage of children who consumed foods rich in vitamin A and foods rich in bioavailable iron in the 24 hours preceding the survey\)](#)

Consumption of foods rich in bioavailable iron among preschool children is rather widespread: about three-quarters (72%) of children aged 6-35 months had consumed this kind of foods¹⁰ in the 24 hours preceding the survey. The proportion of children who had consumed this kind of foods was lower in rural areas, in the South, and among younger children [JPFHS 2007], see table A.9.

It is likely that the consumption of foods rich in bioavailable iron, albeit widespread, may be low quantitatively. Other food sources of iron are foods of vegetable origin, which contain iron with lower bioavailability (nonheme iron) (Alkurd et al., 2010). In addition, the diet contains many antinutritional factors (phytates present in cereals; calcium; phenolic compounds present in tea) which hamper proper absorption of iron. For example young children drink tea during the meal which inhibits iron absorption. These factors,

⁹ Anemia was defined as Hb < 11.0 g/dL; iron deficiency was defined as serum ferritin < 12.0 µg/L; iron deficiency anemia was defined as Hb < 11.0 g/dL and serum ferritin < 12.0 µg/L.

¹⁰ Includes meat, fish, poultry, and eggs.

as well as inadequate infant breastfeeding practices, may explain the high prevalence of iron deficiency among preschool children.

In the population, dietary intakes of iron were derived from the National Household Expenditure and Income Survey conducted from July 2006 to January 2007. This survey provides estimates of household food acquisition which are taken as proxies of consumption. It included almost 13000 households (DoS, 2008; Alkurd et al., 2010). The iron daily intake among the population was estimated at 21 mg/day/capita. When compared to the highest Dietary Reference Intakes (DRI) of iron (18 mg/day), 10 governorates had higher consumption than this DRI and only two governorates (Tafileh and Aqaba) were lower than this DRI but still close (DoS, 2008). An increase in iron intake has been observed since 1992 (18 mg/capita/day), probably as a result of the increase in the meat/fish supply and/or wheat flour fortification programme launched in 2002 (Alkurd et al., 2010).

More efforts are needed to improve the food-based approach to combat iron deficiency.

Iron supplementation of preschool children

No information on iron supplementation of preschool children is available.

Other micronutrient deficiencies

Dietary intakes of zinc and selenium in the population were derived from the National Household Expenditure and Income Survey conducted from July 2006 to January 2007. Selenium intake was well above the highest Dietary Reference Intakes (DRI) of selenium. The estimated zinc intakes of all of the governorates and the Kingdom (9 mg/day) were below the highest DRI of zinc (Alkurd et al., 2010).

Vitamin D deficiency is widespread. The 2010 national micronutrient survey showed that 20% of children aged 12-59 months and as much as 60% of women 15-49 years had vitamin D deficiency, as measured by concentration of serum 25-hydroxy-vitamin D3 lower than the cut-off of 11 ng/mL for children and lower than 12 ng/mL for women (MoH et al., 2011).

Table 2: Micronutrient deficiencies among children

Indicator	Estimate	Reference period	Source	Trends
<i>Iodine deficiency</i>				
Prevalence of goitre in school-age children (8-10 years)	4.9%	2010	MoH et al.	decreasing since 1993
Percentage of households consuming adequately iodized salt	96%	2010	MoH and WHO	increase since 2000
Percentage of children with excessive iodine intake	7%	2000	MoH and WHO	
<i>Vitamin A deficiency</i>				
Prevalence of clinical vitamin A deficiency among children (12-59 months)	n.a.	-	-	-
Prevalence of sub-clinical vitamin A deficiency among children (12-59 months)	18%	2010	MoH et al.	increase since 2002
Percentage of children (6-35 months) who consumed vitamin A-rich foods in the 24 hours preceding the survey	84%	2007	JPFHS	n.a.
Percentage of children (6-59 months) who received vitamin A supplement in the 6 months preceding the survey	9%	2007	JPFHS	n.a.
<i>Iron deficiency</i>				
Prevalence of anemia in children (6-59 months)	34%	2009	JPFHS	stable since 2002
Percentage of children (6-35 months) who consumed foods rich in bioavailable iron in the 24 hours preceding the survey	72%	2007	JPFHS	n.a.

n.a.: not available

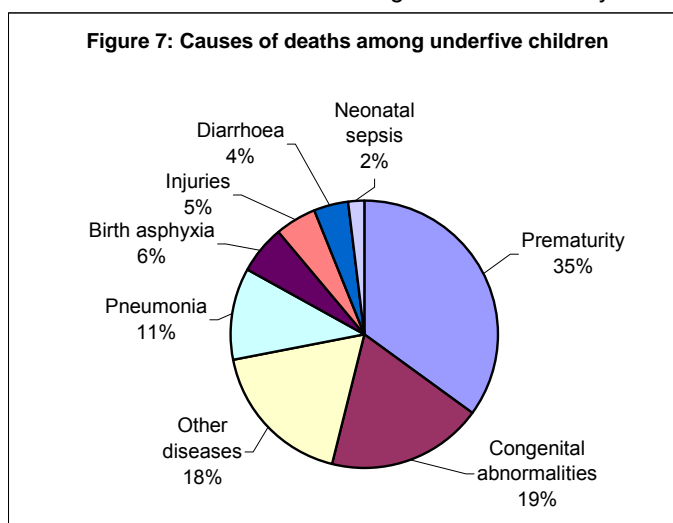
II. 4. Main infant and young child health and mortality indicators

Major achievements have been attained in relation to child health in Jordan. A remarkable reduction is observed in infant and child mortality rates: the infant mortality rate declined from 32‰ in 1990 to 22‰ in 2009 while the under-five mortality rate declined from 39‰ to 25‰ over the same period (UNICEF, 2011). Despite this significant decrease, current rates remain higher than those observed in Lebanon and in the Syrian Arab Republic (UNICEF, 2011). Prematurity is a major cause of deaths among under-five Jordanian children (WHO, 2010a).

Despite long-standing efforts to control diarrhoeal diseases and a vastly extended access to improved water and sanitation, diarrhoea remains rather widespread among children under five [JPFHS 2007]. Contributing factors may be the recently declining sufficiency and reliability of water supplies, the increasing number of rural people using unsafe sources of water, as well as a low exclusive breastfeeding rate (under 6 months) and widespread consumption of breastmilk substitutes (UNICEF and NCFA, 2007). Most children are given oral rehydration therapy or increased fluids during an episode of diarrhoea [JPFHS 2007]. Acute respiratory infections are not frequent among young children [JPFHS 2007]. Malaria is not a problem in Jordan.

The Expanded Programme on Immunisation was launched in 1979. Before 2002, children in Jordan did not always receive the BCG vaccine; it was only included as part of the national vaccination program following the 2002 JPFHS survey. In 2002, 28% of children aged 12-23 months were fully immunized (including BCG); in 2007, they were 87% [JPFHS 2007].

- Figure 7: Distribution of causes of deaths among children under 5 years of age



Source: WHO, 2010a (reference period 2008)

Table 3: Health indicators for children

Indicator	Estimate	Reference period	Source	Trends
<i>Mortality</i>				
Infant mortality rate (under 1 year of age)	22‰	2009	UNICEF	Decrease since 1990
Under-five mortality rate	25‰	2009	UNICEF	Decrease since 1990
<i>Morbidity</i>				
Percentage of under-fives with diarrhoea in the last 2 weeks	16%	2007	JPFHS	³ -
Percentage of under-fives with diarrhoea in the last 2 weeks who received oral rehydration therapy (ORT) ¹	57%	2007	JPFHS	Decrease since 1997
Percentage of under-fives with acute respiratory infection in the last 2 weeks	5%	2007	JPFHS	³ -
Percentage of under-fives sleeping under an insecticide treated bednet	-	-	-	-
<i>Immunization</i>				
Percentage of children from 12 to 23 months with DPT3 immunization	97%	2007	JPFHS	Stable since 2002
Percentage of children from 12 to 23 months with immunization against measles	94%	2007	JPFHS	Stable since 2002
Percentage of children from 12 to 23 months with all basic vaccinations ²	87%	2007	JPFHS	Increase since 2002

¹ ORT includes solution prepared from oral rehydration salt (ORS) packets, recommended home fluids (RHF), or increased fluids.

² BCG, measles, and three doses each DPT and polio vaccine (excluding polio vaccine given at birth).

³ Prevalences of diarrhoea and acute respiratory infection can be influenced by seasonality, trends are not relevant.

The overall development of the country has brought about positive changes in the nutrition status of young children. Acute malnutrition is no longer a concern and chronic malnutrition has regressed considerably. Iodine deficiency disorders have been eliminated. Salt iodine level should be carefully monitored to avoid the risk of excessive iodine intake. However, the country's global transition also brings about changes that are likely to have a significant negative impact on the nutritional status of young children. The decline in exclusive breastfeeding, the increase in bottle-feeding practice, a diet rich in fat and sugar are responsible for the emergence of overweight in the country, along with a decreasing level of physical activity and sedentary lifestyle. Inadequate young child feeding practices and a high prevalence of diarrhoea are also responsible for the persistence of vitamin A and iron deficiencies, although the latter is also related to other factors than inadequate intake of iron.

Nutrition education, awareness, and long-term food-based approaches should be strengthened to tackle the double burden of malnutrition the country is facing.

III: Women's nutritional status

III.1 Anthropometry

[\(Table A.12: Anthropometry of adult women\)](#)

The nationally representative Jordan Population and Family Health Surveys conducted in 2002, 2007 and 2009 document anthropometry of adult women [JPFHS 2002, 2007, 2009].

Undernutrition is not a significant problem among Jordanian women: the prevalence of chronic energy deficiency (CED) was estimated at only 4% in 2009; it did not vary according to place of residence but young women were more affected. By governorate, the highest prevalence was observed in Balqa (6%) [JPFHS 2009]. The prevalence of CED was stable over the period 2002-2009 [JPFHS 2002, 2007, 2009].

In contrast, the prevalence of overweight and obesity was alarming: 28% of women were overweight and 29% were obese in 2009. In the governorates of Mafraq, Karak, Tafiela and Aqaba, more than 60% of women were overweight or obese. The prevalence of obesity was slightly higher in rural areas (31%) than in urban areas (28%). The prevalence of obesity increased markedly with age from 10% among women aged 15-19 to 41% among those aged 40-49 [JPFHS 2009].

The prevalence of overweight was stable but that of obesity showed an upward trend, especially in rural areas where it increased from 26% in 2002 to 31% in 2009 [JPFHS 2002, 2007, 2009].

Jordan is moving through the nutrition transition at a rapid pace. The increasing availability of energy-dense and fat-rich foods, along with the decreasing level of physical activity are among the major determinants of the very high prevalence of overweight and obesity. Given the growing number of working women, there is also an increasing demand for ready-to-eat processed foods. It should also be noted that overweight is desired for women, but these cultural standards are changing as more and more women in urban areas are striving to be thinner, probably due to the exposure to western media (Madanat et al., 2008). That may explain that the prevalence of obesity was slightly higher in rural areas than in urban areas.

Unfortunately, overweight and obesity have not yet been identified as a priority for public health in Jordan and therefore no programme is in place aimed at controlling this problem and its consequences (Madanat et al., 2008).

III.2 Micronutrient status

Vitamin A deficiency (VAD)

Prevalence of clinical and sub-clinical vitamin A deficiency among women

[\(Table A.13: Prevalence of sub-clinical vitamin A deficiency in mothers during their last pregnancy and during lactation\)](#)

Sub-clinical VAD (serum retinol <20 µg/dL) affected about 5% of non-pregnant women in 2010. Young women and women living in rural areas were more affected than their respective counterparts, see table A.13. The prevalence of sub-clinical VAD was much lower in South region than in Central and North regions, but this is to interpret with caution due to the small sample size in the South when compared to other regions (MoH et al., 2011).

Consumption of vitamin A-rich foods among mothers

[\(Table A.15: Percentage of mothers having consumed foods rich in vitamin A and foods rich in bioavailable iron in the 24 hours preceding the survey\)](#)

Consumption of vitamin A-rich foods is widespread among mothers: nearly all mothers of young children (93%) had consumed vitamin A-rich foods¹¹ in the previous 24 hours [JPFHS 2007], see table A.15. No

¹¹ Includes meat, fish, poultry, eggs, carrots, red sweet potatoes, pumpkin, apricot, palm nuts, yellow melon, and green leafy vegetables.

marked differences were observed according to the place of residence. Mothers living in the North and Centre were more likely to consume this kind of food than those living in the South [JPFHS 2007].

Vitamin A supplementation of mothers

[\(Table A.16: Vitamin A and iron supplementation of women of childbearing age\)](#)

There is no vitamin A supplementation programme targeting mothers.

Iron deficiency anemia

Prevalence of anemia in women

[\(Table A.14: Prevalence of anemia in women of childbearing age\)](#)

Micronutrient survey 2010, JPFHS 2009 and 2002 document the prevalence of anemia in women, see table A.14.

Iron deficiency is widespread among women: more than a third (35%) of non-pregnant women suffered from this deficiency in 2010. Anemia still persists as a moderate public health problem since the prevalence among non-pregnant women reached 31%; iron deficiency anemia¹² affected one woman out of five. Iron deficiency is thus a major determinant of anemia in women. Iron deficiency anemia was more prevalent in rural areas and in the South region (MoH et al., 2011).

Both JPFHS 2009 and 2002, which included all women, showed a prevalence of anemia of about 25% [JPFHS 2002; JPFHS 2009].

The 2010 micronutrient survey showed that 11% of women aged 15-49 had a vitamin B12 deficiency and 14% had a folate deficiency (MoH et al., 2011). These nutritional deficiencies are also responsible for anemia.

Consumption of foods rich in bioavailable iron among mothers

[\(Table A.15: Percentage of mothers having consumed foods rich in vitamin A and foods rich in bioavailable iron in the 24 hours preceding the survey\)](#)

Consumption of foods rich in bioavailable iron among mothers is widespread: 84% of them had consumed this type of food¹³ in the previous 24 hours [JPFHS 2007], see table A.15. Mothers living in urban areas and those living in the Central and North regions were more likely to consume this kind of foods [JPFHS 2007].

However, it is likely that only small quantities of this kind of foods are consumed. Most food sources of iron are foods of vegetable origin, which contain nonheme iron which is less bioavailable (Alkurd et al., 2010). Antinutritional factors present in the diet and frequent consumption of tea with meals may also explain the high prevalence of iron deficiency anemia in women.

Iron supplementation of pregnant women

[\(Table A.16: Vitamin A and iron supplementation of women of childbearing age\)](#)

The iron supplementation programme for pregnant women started in 1980 in which iron and folic acid capsules are given to pregnant women visiting the Maternal and Child Health Centers (Madanat et al., 2008). The coverage increased from 2002 (71%) to 2007 (79%) to reach 81% in 2009 [JPFHS 2002, 2007, 2009], but is lower in rural areas [JPFHS, 2009].

¹² Anemia is defined as hemoglobin <12.0 g/dL; iron deficiency is defined as serum ferritin < 15.0 µg/L; iron deficiency anemia is defined as hemoglobin < 12.0 g/dL and serum ferritin < 15.0 µg/L.

¹³ Include meat, fish, poultry, and eggs.

Table 4: Micronutrient deficiencies among women

Indicator	Estimate	Reference period	Source	Trends
<i>Vitamin A deficiency</i>				
Prevalence of adjusted night blindness in mothers	n.a.	-	-	-
Prevalence of sub-clinical vitamin A deficiency in non pregnant women	5%	2010	MoH et al.	n.a.
Percentage of mothers having consumed vitamin A-rich foods in the 24 hours preceding the survey	93%	2007	JPFHS	n.a.
Coverage of vitamin A supplementation in mothers	n.a.	-	-	-
<i>Iron deficiency</i>				
Prevalence of anemia in non pregnant women	31%	2010	MoH et al.	n.a.
Percentage of mothers having consumed foods rich in bioavailable iron in the 24 hours preceding the survey	84%	2007	JPFHS	n.a.
Coverage of iron supplementation in pregnant women	81%	2009	JPFHS	Increase since 2002

n.a.: not available

Long-term measures to combat micronutrient deficiencies

Vitamin A, iron and zinc deficiencies are identified as public health problems in Jordan. In April 2002, Jordan began a wheat flour fortification programme that included iron and folic acid. In March 2006, the fortification requirements were expanded to include vitamin A, zinc, thiamin, riboflavin, niacin, vitamin B6, and cobalamin in addition to iron and folic acid, and at the end of 2010 vitamin D3 was added to the flour. The flour that is fortified is the *Mowahad* wheat flour, which is used to make bread; this is the only subsidized flour and constitutes 93% of wheat flour production in Jordan. Flour fortification is mandatory and compulsory by the laws. Fortified biscuits provided to school-children through the School Feeding Programme are made from the same fortified flour (WHO, 2010b).

Flour fortification in iron and folic acid probably contributed to reduce iron deficiency in women of childbearing age since iron deficiency contributes significantly to the high prevalence of anemia in this population group. Among preschool children however, factors other than iron deficiency contribute significantly to the high prevalence of anemia (e.g. high prevalence of diarrhoea). It is therefore important to develop alternative approaches (control of infection diseases, changes in consumption patterns of certain foods, etc.) to reduce the prevalence of anemia in this age group.

Since micronutrient deficiencies are widespread, supplementation and fortification should be accompanied with long-term food-based approaches aiming to promote the consumption of iron-rich foods and encourage dietary habits that may enhance iron absorption.

In 1999, Jordan's Ministry of Education (MoE) initiated a "school snack service" (mid-morning snack) through the School Feeding Programme. The "school snack service" targeted primary school-children in the first three elementary grades from seven disadvantaged semi rural districts. Initially, biscuit, fresh cow's milk and a piece of fruit were provided to school-children aged 6-8 years. Progressively this programme extended to include children from kindergarten to 10 years of age and biscuits fortified with vitamin A, vitamins B, folate, niacin, iron and zinc were distributed. Since 2008, milk is no more distributed due to transportation problems. The programme expanded and targeted more than 500,000 children in 2009. It aims to improve the feeding and health status of children in public schools in the less privileged areas, develop and fix life-long positive attitudes and nutritious food habits and reduce dropouts. The MoE plans to continue expanding its reach to cover the entire kingdom (UNDP, 2010a).

III. 3 Health, water and sanitation

Health

Due to the country's stability and to a range of effective development plans and projects that have included health as a major component, health conditions in Jordan are among the best in the Middle East [JPFHS 2007].

Maternal deaths are declining: the (declared) maternal mortality ratio of 19 deaths per 100 000 live births reported for 2007-2008 showed a remarkable reduction of 54% since 1995-1996 (DoS, 2010), as a result of large investments made in the maternity area over the past decades (DoS, 2010). Adjusted maternal mortality ratio, estimated at 59 per 100 000 live births in 2008, decreased by 48% since 1990 (UNICEF, 2011; UNICEF, Statistics by area – Maternal Health, 2011). However, as observed for children mortality rates, adjusted maternal mortality ratio remains higher than the one observed in Lebanon and in Syrian Arab Republic and despite considerable progress over the past two decades, Jordan is not yet on track to achieve its 2015 target of 28 deaths per 100 000 live births (UNICEF, 2011; WB, 2011).

Total fertility rate has declined from 6.6 children per woman in the early 1980s to 3.7 in 2002. It has remained almost unchanged between 2002 and 2009 [JPFHS 2009]. More than 90% of pregnant women had at least four antenatal care visits and almost all births are delivered with the assistance of a health professional [JPFHS 2007].

Prevalence of HIV/AIDS in adults remains very low (less than 0.2% in 2007) (UNAIDS, 2010).

Access to health care services

Jordan's health sector performs well in terms of access and health outcomes. Services are delivered through an extensive network of public and private facilities, and overall capacity in terms of human and material resources is high (WHO/EMRO, 2006b).

Many women are concerned that there might not be a female provider at the health facility. Transport, distance to health facility and cost are some other common problems faced in accessing health care [JPFHS 2007]. The Government provides free health insurance for all young children and for people living in disadvantaged areas (WHO/EMRO, 2006a).

The epidemiological transition, marked by the progressive increase of non-communicable diseases, is one of the challenges the Jordanian health system has to face (WHO/EMRO, 2006b).

Access to an improved water source and to improved sanitation

In 2008, almost all Jordanians had access to an improved water source (96%) but some disparities persist between urban and rural areas, where access has not improved over the last decade (UNICEF, 2011; WHO/UNICEF, 2010). Due to scarce water resources, Jordan has been implementing a rationing programme since 1988 and water is only provided intermittently with supply frequency of once or twice a week (WHO/EMRO, 2003; Taha and Bataineh, 2002). Ninety-eight percent of the population had access to improved sanitation, with no difference between urban and rural areas (UNICEF, 2011).

Table 5: Major indicators of health, access to water and sanitation

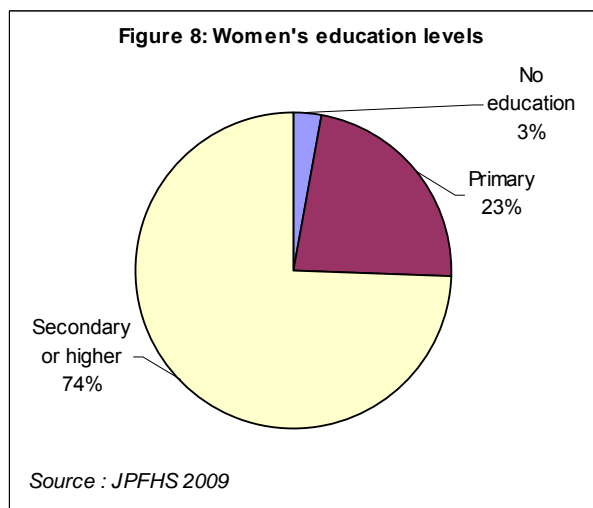
Indicator	Estimate	Reference period	Source	Trends
<i>Health and care</i>				
Maternal mortality ratio:				
declared	19 per 100 000 live births	2007-2008	DoS	Decrease since 1995-96
adjusted	59 per 100 000 live births	2008	UNICEF	Decrease since 1990
Total fertility rate	3.8 children per woman	2009	JPFHS	Decrease between 1980s and early 2000, then stable
Prevalence of HIV/AIDS among women age 15-49	n.a.	-	-	-
Percentage of mothers who had four or more antenatal care visits	94%	2007	JPFHS	Increase compared to 2002
Health personnel: number of physicians	245 per 100 000 people	2009	WHO	Increase since 2004
Percentage of births attended by skilled health personnel	99%	2007	JPFHS	Stable compared to 2002
<i>Water and sanitation</i>				
Percentage of the population with access to an improved water source:				
urban areas	98%	2008	UNICEF	Stable since 1990
rural areas	91%	2008	UNICEF	Stable since 1990
Percentage of the population with access to an improved sanitation:				
urban areas	98%	2008	UNICEF	Stable since 1990
rural areas	97%	2008	UNICEF	Increase since 1995

n.a.: not available

III. 4 Women's empowerment

Broad-based access to education has received greater emphasis over the past decades, which translates into high women's education level: almost three-quarter of ever-married women have secondary and higher education [JPFHS, 2009]. However, these achievements fail to translate into women's economic empowerment. Women's participation in the formal sector labour force remains low, equal access to resources and control over them (loan, borrowing, etc.) is still challenging. The lack of economic empowerment is mirrored by lack of empowerment within the household. The gender gap in human development is still wide (MPIC et al., 2004; MPIC, 2010).

- Figure 8: Ever-married women's education level (highest education level attended or completed)



Among women, the major nutritional problems are the alarming prevalence of overweight and obesity and the high prevalence of anemia. The fortification of wheat flour is one of the long-term approaches developed to combat micronutrient deficiencies in the population. However, food-based approaches need to be developed further.

Significant efforts have been made in maternal and child health, environmental hygiene, and women's empowerment, all these factors contributing to the improvement of the nutritional status of the population.

IV: Nutritional status of other groups of population

IV.1. School-age children

Anthropometry

In underprivileged areas of Jordan, stunting remains prevalent among school-age children (15% of children aged 5.5-10 years were stunted in 2002; Khatib and Hijazi, 2009). Local surveys also indicate a high prevalence of overweight and obesity among school-age children: in the governorate of Irbid (north-west of Jordan), 19% of children aged 6-12 years were overweight and 6% were obese in 2006¹⁴ (Khader et al., 2007).

Micronutrient deficiencies

Through the School Feeding programme implemented by the MoE (see Long-term measures to combat micronutrient deficiencies), each child also received, in addition to a snack, a vitamin A oil capsule. The baseline assessment indicated that the prevalence of sub-clinical vitamin A deficiency among these children aged 5.5-11 years was 22% (although the frequency of consumption of vitamin A rich foods was rather high) and the prevalence of anemia¹⁵ was 19%. After the programme, the prevalence of VAD was halved (11%) and that of anemia was of 15% (Khatib, 2002).

Since 2000, the MoH provides vitamin A supplements to school children (6-11 years) in high risk areas (UNICEF and NCFA, 2007).

IV.2. Adolescents

Anthropometry

Adolescents are also affected by overweight and obesity: a local survey conducted among pupils aged 13–16 years of the governorate of Irbid in 2007 indicated that 16% were overweight and 9% were obese. Only 4% were underweight¹⁶. The prevalence of overweight was higher among girls while that of obesity was higher among boys. Pupils living in urban areas were more likely to be obese probably due to a higher consumption of fast-food in these areas (Abu Baker and Daradkeh, 2010). Overweight and obesity among school-age children and adolescents is an emerging public health problem against which prevention programmes should be implemented.

Micronutrient deficiencies

Micronutrient deficiencies among adolescents are not documented.

IV.3. Men

Anthropometry

Men are also affected by overweight and obesity. A prevalence of obesity (BMI ≥ 30 kg/m²) of 33% was reported among men living in semi-urban communities in different regions of the country in the late 1990s (Ajlouni et al., 1998). In a town of northern Jordan (Sarih), 40% of men aged 25 years and above were overweight and 35% were obese¹⁷ in 2004 (Khader et al., 2008). There had been a significant increase (10 percentage points) in the prevalence of obesity between the two surveys that were conducted 10 years apart in the same population (1994 and 2004) (Khader et al., 2008). In all surveys, the prevalence of obesity was lower in men than in women (Ajlouni et al., 1998; Khader et al., 2008).

¹⁴ Based on international cut-off points for BMI for overweight and obesity between 2 and 18 years, as defined by Cole et al., 2000.

¹⁵ Subclinical vitamin A deficiency was defined as serum retinol concentration $<0.70\mu\text{mol/L}$; anemia was defined as hemoglobin concentration <11.0 g/dL

¹⁶ Underweight: BMI $<5^{\text{th}}$ percentile; overweight: $85^{\text{th}} \leq \text{BMI} < 95^{\text{th}}$ percentile; obesity: BMI $\geq 95^{\text{th}}$ percentile

¹⁷ A BMI between 25 and 29.9 kg/m² was defined as overweight and a BMI 30 kg/m² or greater was defined as obesity.

Micronutrient deficiencies

Vitamin D deficiency is not widespread among adult men (5%) (Batieha et al., 2011). Dress style in women may be a contributing factor to the high prevalence of vitamin D deficiency among women when compared to men (Batieha et al., 2011).

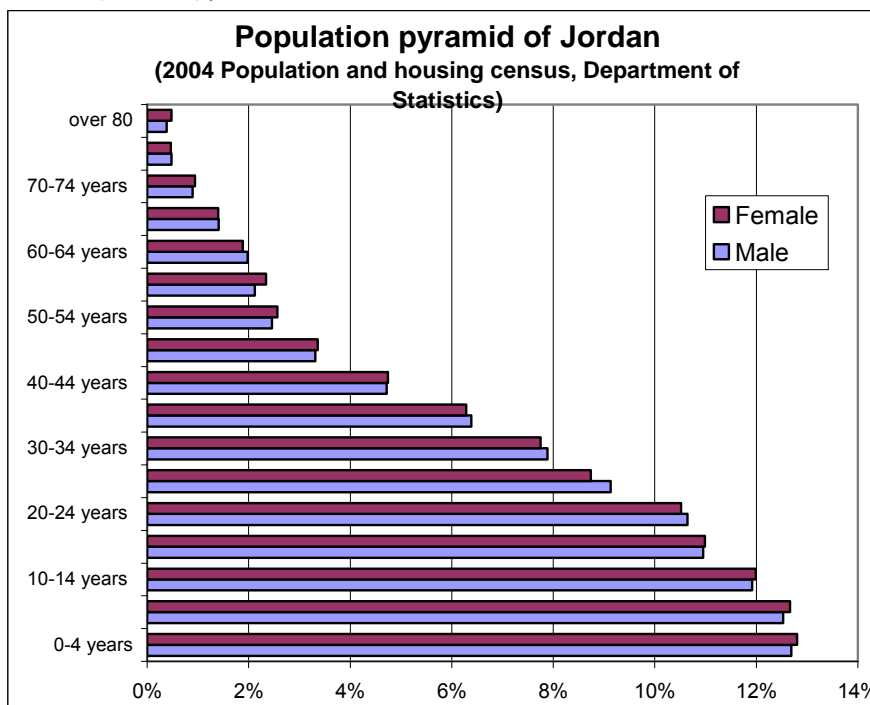
V: Human and economic resources

V.1. Human resources

Population

Jordan has undergone a demographic transition: mortality rates have decreased, life expectancy has increased and fertility rate has decreased (Madanat et al., 2008). Jordan's population is still very young, with a third of the population under the age of 15 (UNPD, 2011). A huge population growth has been accompanied by rapidly increasing urbanization due to internal rural-to-urban migration, combined with the influx of refugees and migrants (MPIC et al., 2004). In 2010, about 80% of the population lived in urban areas as compared to about 50% in the 1960s (UNPD, 2011).

- Figure 9: Population pyramid



Literacy and education

Jordan has developed a comprehensive and high-quality education system. As of 2008, the net primary enrollment rate was 94%, which was higher than the regional average for Arab States of 86% (UNESCO, 2010). Gender parity in primary education is also ensured and Jordan is one of the few Arab countries that have very small disparity in primary school attendance rates among urban and rural areas. The country's burgeoning youth population requires the continued expansion of the educational system. Along with this quantitative expansion, Jordan seeks to improve the quality of its teachers, books, curriculum and facilities (OKH, no date).

Table 6: Human indicators

Indicator	Estimate	Reference period	Source	Trends
<i>Population</i>				
Total population	6.472 million	2010	UNPD	Doubled since 1990
Annual population growth rate	3%	2005-2010	UNPD	Increase compared to 2000-2005
Rural population	22%	2010	UNPD	Decrease since the 1980s
Agricultural population	6%	2010	FAOSTAT	Constant decrease since the 1980s
Life expectancy at birth	72.5 years	2005-2010	UNPD	Increase
Net migration rate	8‰	2005-2010	UNPD	Increased compared to 2000-2005
Total dependency rate	60%	2010	UNPD	Decrease compared to 2000-2005
Orphans (0-17 years)	n.a.	n.a.	n.a.	n.a.
<i>Education</i>				
Adult literacy rate (aged 15 and over):				
men	96%	2007	UNESCO	Stable compared to 2000-2004
women	89%	2007	UNESCO	Increase compared to 2000-2004
Net primary enrolment ratio	94%	2008	UNESCO	Increase in 1990s then stable
Ratio of girls to boys in primary education	1.01 girl per 1 boy	2008	UNESCO	Gender parity index already attained in the early 1990s
Percentage of children who completed primary education grade 5	99%	2006-2007	UNESCO	Stable since early 2000
<i>Level of development</i>				
Human development index [0-1]	0.681	2010	UNDP	Increase

n.a.: not available

V.2. Economic resources

Despite the lack of land, water, mineral and energy resources, Jordan's economy has shown strong performance since 2000 (GDP annual growth around 7%); it slowed down in 2009 due to global economic slowdown (WB, 2010). The decreasing agricultural sector has obtained little national or international investments in comparison with other economic sectors (WB, 2010; FAO, AQUASTAT, 2008).

Positive results in human development are based on consistent high level of spending on education, health, and social safety nets (WB, 2010).

Table 7: Economic indicators

Indicator	Estimate	Reference period	Source	Trends
Gross Domestic Product per capita	5474 PPP US \$	2008	UNDP	Increase
GDP annual growth	2.3%	2009	WB	Increase in the 2000s (decline in 2009)
Industry as % of GDP	32%	2009	WB	Increase
Agriculture as % of GDP	3%	2009	WB	Decrease
Services as % of GDP	65%	2009	WB	Stable over the last two decades
Agriculture public expenditure	0.6% of GDP	2007	IFPRI	Decrease over the last decade
Health public expenditure	5.4% of GDP	2000-2007	UNDP	n.a.
Education public expenditure	4.9% of GDP	2000-2007	UNDP	Decrease compared to 1990

n.a.: not available

Policies and programmes aiming to improve nutrition and food security

The Government of Jordan has approached food security through three sectoral entry points: social protection initiatives (e.g. distribution of cash), short-term responses to economic events (e.g. removal of taxes and tariffs on essential commodities, subsidization of some food items) and long-term poverty alleviation interventions (AARDO, 2010).

A Special Programme for Food Security was formulated in 2004 in collaboration with FAO. This Programme was expanded and became the National Programme for Food Security (NPFS), which was approved in 2005. The main objective of this programme is to improve food security of poor rural households, mainly through a sustainable increase in productivity of small farmers and a reduction in year-to-year variability in production. The programme also aims at promoting income-generating activities, maximizing the degree of self-reliance of rural women and increasing net incomes through activating the role of rural families. The programme includes 21 projects to be implemented by the various technical departments of the Ministry of Agriculture, such as the development of field crop production, horticulture and small livestock at household level. On the 21 projects planned, about half have already been implemented. In 2011, about 18,000 families of farmers in all regions of the country should benefit from these projects. A mid-term review is underway that will assess the performance of the programme and provide the basis for defining future directions (Personal communication F. Hadhri, FAO; AARDO, 2010; MoH and WHO, 2010b).

In 2010, a Joint UN Programme on Food and Nutrition Security in Jordan towards poverty alleviation was implemented for a 3-year period (UNDP/GoJ, 2010). This Programme includes 4 outcomes: national food security response is enhanced and coordinated; small-holder farmer sustainable food production is increased; nutrition interventions and safety nets are strengthened and made more accessible; and sustainable livelihoods and food security of the poor are enhanced. Various ministries (Ministries of Planning, Agriculture, Education, Health) and organisms are responsible for its implementation (UNDP/GoJ, 2010). In the framework of this Programme, the Jordanian Government intends to design a National Food Security Strategy and a Plan of Action with funding from UNDP. The Government established a High Committee on Food Security in December 2010, chaired by the Ministry of Agriculture with representatives from relevant food security stakeholders, to monitor and oversee the food security strategy and programmes in the country (Personal communication F.Hadhri, FAO).

Since 1980s, the Government has developed a strong social safety net strategy. Initially, it took the form of generalized untargeted subsidies of many foodstuffs. These subsidies have been sequentially removed. They were replaced with food coupons made available to Jordanians households to buy sugar, rice and powdered milk. Food coupons were replaced by cash transfers that were eliminated in 1999 (Shaban et al., 2001). Currently, subsidized foods include wheat flour, rice and sugar. Wheat flour, which is used to make bread, is subsidized up to 50% by the government; as a result, although prices on international markets have been increasing recently, the price of bread remained stable for the consumer in Jordan. Sugar and rice are subsidized indirectly through a reduction of taxes on the food imported.

Regarding nutrition interventions, in 2010, MoH and WHO proposed multi-sectoral food and nutrition policies (MoH and WHO, 2010b):

- incorporating healthy nutrition objectives into the National Health Development Plan
- improving food security by (i) promoting the availability of the main food commodities from domestic resources, (ii) diversifying food exports according to the food security needs of the country, and monitoring and regulating the quality and quantity of food imports, as necessary, (iii) addressing inequalities and improving nutrition of poor and marginalised populations.
- strengthening food safety and consumer protection
- promoting infant and childhood nutrition and preventing micronutrient deficiencies by (i) reducing the prevalence of VAD among children (promotion of the consumption of vitamin A-rich foods, vitamin A supplementation programmes, communication strategy, etc.); (ii) reducing the prevalence of anemia among the population (promotion of the consumption of iron-rich foods, supplementation programmes to pregnant women and to all children under five, especially for those under two years of age, surveillance and control programmes for diseases like schistosomiasis and parasitic infections, expansion of the current flour fortification programme to include all types of flour); (iii) eliminating IDD; (iv) reducing chronic malnutrition among the under-five years and young school children in rural and under-privileged areas (promotion of exclusive breastfeeding and complementary feeding practices, strengthen the assessment of growth and development programmes for under-five years and young school children; strengthening Maternal and Child Health services and promote the implementation of the Integrated Management of Childhood Illness programme).

- improving the nutritional status of the disadvantaged, socio-economically deprived and nutritionally vulnerable groups (through awareness and education, capacity building, monitoring and evaluation)
- preventing diet related non-communicable diseases (strengthen efforts to control major risk factors for NCDs by public health action, health promotion and disease prevention measures)

Some nutrition objectives are also included in the Joint UN Programme; these objectives aim to enhance micronutrient supplementation and flour fortification, increase the rate of exclusive breastfeeding from 22% to 25% in three years, promote adequate complementary feeding practices, strengthen the School Feeding Programme, etc. (UNDP/GoJ, 2010).

Appendixes

Appendix I: Food supply and consumption

Name of the survey: Household Expenditure and Income Survey 2008 (DoS, 2009)

Study population: Households

Period of data collection: March 2008 - February 2009

Representativity: National

Methodology: Household diary method where quantity and value of goods purchased by the household were recorded for each day of the week - data collected for one week in each round (4 rounds)

Table A.1: Food consumption data

Survey name and date (Reference)	Region	Survey population: households/ individuals	Sample characteristics			Average food consumption														
			Age (years)	Sex	Sample size	Major food groups (g/person/day)														
						Cereals	Starchy roots	Pulses, nuts & oilcrops	Fruit & vegetables ¹	Oils & fats	Meat & offals	Fish & seafood	Milk, dairy products & eggs	Sugar & derived products						
Household Expenditure and Income Survey 2008 (Mar. 2008-Feb. 2009) (DoS, 2009)	Total	Households	All	M/F	12768	483	67	n.a.	412	40	150	11	n.a.	n.a.						
	Urban	Households	All	M/F	n.a.	471	65	n.a.	447	41	150	12	n.a.	n.a.						
	Rural	Households	All	M/F	n.a.	538	73	n.a.	368	34	151	8	n.a.	n.a.						
Nutrient intake (per person/day)																				
						Energy (kcal)	% from protein	% from lipid		Protein (g)	% protein from animal origin		Lipid (g)	% lipid from animal origin						
						n.a.	n.a.	n.a.		n.a.	n.a.		n.a.	n.a.						
Percentage of energy intake provided by																				
						Cereals	Starchy roots	Pulses, nuts & oilcrops	Fruit & vegetables	Oils & fats	Meat & offals	Fish & seafood	Milk, dairy products & eggs	Sugar & derived products						
						n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.						

n.a.: not available (methodological issues)

¹: Canned fruits, canned vegetables, lettuce and parsley mint are not taken into account in this food group as they were expressed in piece. Their quantity is however limited.

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Appendix II: Nutritional status and feeding practices of young children

Name of the survey: Jordan Population and Family Health Survey 2007 (DoS and Macro Int. Inc., 2008)

Study population: Children under 5 years of age

Period of data collection: June-November 2007

Representativity: National

Table A.2: Initiation and duration of breastfeeding

Survey name/date (Reference)	Background characteristics	Sample size (all children under five years)	Percentage of children under five years ever-breastfed	Number of children under five years ever breastfed	Among last born children everbreastfed, percentage breastfed within one hour of birth	Among last born children everbreastfed, percentage breastfed within 24 hours of birth ¹	Number of children under three years	Median duration of breastfeeding in children under three years (in months) ²
Jordan Population and Family Health Survey [JPFHS] 2007 (DoS and Macro Int. Inc, 2008)	Total	9864	93.1	6076	38.8	81.5	4857	12.8
	Sex							
	M	4994	92.9	3106	38.2	80.0	2470	14.5
	F	4870	93.3	2970	39.5	83.1	2387	11.7
	Residence							
	urban	8262	93.0	5101	38.6	81.2	4053	12.7
	rural	1601	93.7	976	39.9	83.0	805	13.6
	Region							
	North	2864	94.2	1800	33.1	82.5	1425	13.5
	Central	6127	92.8	3751	40.5	81.2	2997	12.3
	South	873	91.9	525	46.3	80.4	435	13.0
	Governorates							
	Amman	3784	92.1	2313	35.8	78.9	n.a.	11.7
	Balqa	615	95.3	380	40.1	81.1	n.a.	13.4
	Zarqa	1486	93.9	917	49.1	86.1	n.a.	11.9
	Madaba	242	89.5	141	63.7	86.0	n.a.	11.3
	Irbid	1861	94.2	1194	31.4	82.3	n.a.	13.3
	Mafraq	479	94.0	286	32.1	79.2	n.a.	12.2
	Jarash	290	93.7	175	44.3	85.8	n.a.	13.6
	Ajloun	233	96.1	145	36.0	86.9	n.a.	14.1
	Karak	348	89.6	209	48.0	80.9	n.a.	12.8
	Tafiela	140	93.9	84	47.0	82.9	n.a.	12.8
	Ma'an	167	92.6	101	51.2	80.5	n.a.	11.4
Aqaba	217	93.6	131	39.4	77.8	n.a.	13.1	
Mother's education								
no education	241	91.4	140	47.8	84.8	101	15.7	
primary*	1956	93.3	1190	43.4	81.3	263	14.4	
secondary or higher	7667	93.1	4746	37.4	81.4	4493	12.7	

¹ Includes children who started breastfeeding within one hour of birth

²: Data for median duration of breastfeeding come from Statcompiler (DHS) with the exception of data by Governorate.

*: primary education includes elementary (6 years) and preparatory (4 years)

North region includes the Governorates of Irbid, Ajloun, Jarash, Mafraq. Central region includes Balqa, Madaba, Amman, Zarqa. South region includes Karak, Tafiela, Ma'an, Aqaba.

n.a.: not available

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Name of the survey: Jordan Population and Family Health Survey 2007 (DoS and Macro Int. Inc., 2008)

Study population: Children 6-23 months

Period of data collection: June-November 2007

Representativity: National

Table A.3: Adequate infant and young child feeding practices

Survey name/date (Reference)	Background characteristics	Sample size – all children 6-23 months of age (breastfed and non-breastfed)	Percentage of children 6-23 months (breastfed and non-breastfed) fed in the 24 hours preceding the survey			
			Breastmilk, milk or milk products	At least 3 or 4 food groups ¹	The minimum times or more ²	With 3 appropriate infant and young child feeding practices ³
Jordan Population and Family Health Survey [JPFHS] 2007 (DoS and Macro Int. Inc, 2008)	Total	2584	98.6	84.9	42.4	38.3
	Residence					
	urban	2137	98.6	85.3	42.0	38.0
	rural	447	98.3	82.9	44.2	39.9
	Region					
	North	787	99.3	83.6	42.6	37.7
	Central	1565	98.4	85.8	42.5	38.8
	South	232	97.4	83.1	41.1	36.9
	Governorates					
	Amman	1008	98.4	84.9	44.4	40.3
	Balqa	155	98.5	88.2	44.9	40.3
	Zarqa	341	98.1	87.6	37.0	34.5
	Madaba	(62)	(99)	(84)	(36)	(34)
	Irbid	522	99.6	83.3	43.1	37.9
	Ma'raq	123	98.8	80.0	43.8	39.2
	Jarash	(87)	(98)	(86)	(40)	(35)
	Ajloun	(55)	(100)	(90)	(39)	(36)
	Karak	(85)	(97)	(84)	(43)	(38)
	Tafiela	-	-	-	-	-
	Ma'an	-	-	-	-	-
Aqaba	(65)	(98)	(82)	(36)	(32)	

¹: At least 3 food groups for breastfed children and at least 4 food groups for non-breastfed children

²: Fed solid or semi-solid food, at least twice a day for breastfed children aged 6-8 months, at least 3 times per day for breastfed children aged 9-23 months, at least 4 times per day for non-breastfed children aged 6-23 months.

³: Children aged 6-23 months (breastfed and non-breastfed taken together) are considered to be fed with a minimum standard of three Infant and Young Child Feeding (IYCF) practices if they are breastfed or if they receive other milk or milk products, and are fed at least the minimum number of food groups, at least the minimum number of times per day.

Data into brackets are based on small sample size (50-100) and therefore must be interpreted with caution. Data based on sample <50 are not shown (-). North region includes the Governorates of Irbid, Ajloun, Jarash, Ma'raq. Central region includes Balqa, Madaba, Amman, Zarqa. South region includes Karak, Tafiela, Ma'an, Aqaba.

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Name of the survey: Jordan Population and Family Health Survey 2007 (DoS and Macro Int. Inc., 2008)

Study population: Children 6-35 months

Period of data collection: June-November 2007

Representativity: National

Table A.4: Consumption of complementary foods, and meal frequency by breastfeeding status and age

Survey name/date (Reference)	Age (months)	Breastfeeding status*	Number of children	Foods consumed by children in the 24 hours preceding the survey						
				Percent of children having consumed the following foods						
				Infant formula	Other milk ¹	Cheese, yogurt, other milk products	Legumes and nuts	Meat/fish/eggs	Foods with oil/fat/butter	Fruits and vegetables rich in vit. A ²
Jordan Population and Family Health Survey [JPFHS] 2007	6-11	Breastfed	671	33.7	36.9	65.8	22.4	39.7	48.5	40.9
	6-11	Non breastfed	258	79.8	83.2	71.0	23.0	54.7	57.4	46.6
	12-23	Breastfed	470	28.6	49.3	85.0	47.8	73.0	82.9	61.6
	12-23	Non breastfed	1183	42.5	76.9	80.8	46.5	80.3	82.2	62.6
(DoS and Macro Int. Inc, 2008)	24-35	Breastfed and non breastfed	1190	27.2	66.5	85.2	53.6	85.5	90.3	65.4

* Breastfed children or non breastfed children or breastfed and non breastfed taken together

¹: other milk includes fresh, tinned and powdered cow or other animal milk

²: Includes carrots, red sweet potatoes, pumpkin, apricot, palm nuts, yellow melon, and green leafy vegetables

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Name of the survey: Micronutrient survey 2010 (MoH et al., 2011)
Study population: Children 1-4.99 years
Period of data collection: March – April 2010
Representativity: National
Norms of reference: WHO 2006 growth standards

Table A.5: Anthropometry of preschool children

Name/date of survey (month/year) (Reference)	Background characteristics	Age (years)	Sex	Sample size	Prevalence of malnutrition											
					Stunting Height-for-age				Wasting Weight-for-height				Underweight Weight-for-age			
					< -3 Z-scores	< -2 Z-scores*	< -2 Z-scores*	< -3 Z-scores*	< -3 Z-scores	< -2 Z-scores	< -2 Z-scores*	< -3 Z-scores*	< -3 Z-scores	< -2 Z-scores	< -2 Z-scores**	< -3 Z-scores*
Total		1-4.99	M/F	1023	n.a.	10.8	n.a.	3.5	n.a.	2.5	8.8	1.8				
Sex																
Micronutrient Survey 2010 (March- April 2010)		1-4.99	M	n.a	n.a.	12.1	n.a.	3.9	n.a.	3.4	9.2	2.5				
		1-4.99	F	n.a	n.a.	9.6	n.a.	3.0	n.a.	1.5	8.4	1.1				
	Age															
(MoH et al., 2011)		1-1.99	M/F	n.a	n.a.	7.9	n.a.	2.6	n.a.	1.7	10.4	1.5				
		2-2.99	M/F	n.a	n.a.	14.0	n.a.	3.9	n.a.	2.1	10.3	3.7				
		3-3.99	M/F	n.a	n.a.	12.4	n.a.	3.2	n.a.	2.8	9.1	1.2				
		4-4.99	M/F	n.a	n.a.	9.3	n.a.	4.1	n.a.	3.2	5.7	0.9				
Residence																
	urban	1-4.99	M/F	n.a	n.a.	9.6	n.a.	3.8	n.a.	2.6	8.3	1.3				
	rural	1-4.99	M/F	n.a	n.a.	15.7	n.a.	2.1	n.a.	1.8	10.6	4.0				
Region																
	North	1-4.99	M/F	n.a	n.a.	12.0	n.a.	4.9	n.a.	4.3	8.1	1.9				
	Central	1-4.99	M/F	n.a	n.a.	9.8	n.a.	2.6	n.a.	1.2	8.5	1.7				
	South	1-4.99	M/F	n.a	n.a.	13.7	n.a.	3.5	n.a.	3.3	14.4	2.5				

* Category <-2 Z-scores includes <-3 Z-scores

** Category > +2 Z-scores does not include > +3 Z-scores (>+2 Z-scores and <+3 Z-scores)

North region includes the Governorates of Irbid, Ajloun, Jarash, Mafrq, Central region includes Balqa, Madaba, Amman, Zarqa. South region includes Karak, Tafila, Ma'an, Aqaba

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Name of the survey: Jordan Population and Family Health Survey 2009 (DoS and ICF Macro, 2010)
Study population: Children under 5 years of age
Period of data collection: October - December 2009
Representativity: National
Norms of reference: WHO 2006 growth standards

Table A.5: Anthropometry of preschool children (cont'd)

Name/date of survey (month/year) (Reference)	Background characteristics	Age (years)	Sex	Sample size	Prevalence of malnutrition						
					Percentage of children with						
					Stunting		Wasting		Underweight		Overweight
					Height-for-age	Weight-for-height	Weight-for-age	Weight-for-height	Weight-for-height		
< -3 Z-scores	< -2 Z-scores*	< -3 Z-scores	< -2 Z-scores*	< -3 Z-scores	< -2 Z-scores*	< -3 Z-scores	< -2 Z-scores*	> +2 Z-scores			
Total		0-4.99	M/F	4056	1.7	8.0	0.2	1.5	0.2	1.9	6.5
Sex											
		0-4.99	M	2107	1.9	7.8	0.3	1.5	0.2	1.6	7.7
		0-4.99	F	1950	1.5	8.1	0.1	1.6	0.2	2.1	5.2
Age											
		0-0.49	M/F	378	0.4	5.5	0.3	1.2	0.3	1.3	7.7
		0.5-0.99	M/F	425	0.6	1.7	0.1	4.5	0.2	0.8	7.5
		1-1.99	M/F	884	2.7	9.9	0.7	1.1	0.3	1.2	7.4
		2-2.99	M/F	861	2.0	10.5	0.0	1.3	0.0	2.4	6.4
		3-3.99	M/F	771	1.7	6.6	0.1	0.8	0.1	1.6	5.8
		4-4.99	M/F	738	1.5	9.1	0.1	1.6	0.3	3.1	5.0
Residence											
	urban	0-4.99	M/F	3331	1.5	7.1	0.2	1.5	0.2	1.8	6.5
	rural	0-4.99	M/F	726	2.6	11.9	0.4	1.6	0.2	2.3	6.3
Region											
	North	0-4.99	M/F	1296	1.6	8.7	0.2	1.0	0.1	1.6	6.3
	Central	0-4.99	M/F	2350	1.5	6.7	0.2	1.9	0.2	2.0	6.0
	South	0-4.99	M/F	410	3.5	12.9	0.4	1.0	0.5	1.9	9.8
Governorates											
	Amman	0-4.99	M/F	1401	1.2	5.8	0.1	2.1	0.0	1.5	6.3
	Balqa	0-4.99	M/F	259	3.7	11.9	0.6	3.0	1.2	4.0	6.1
	Zarqa	0-4.99	M/F	600	1.0	5.9	0.0	0.9	0.0	1.8	5.4
	Madaba	0-4.99	M/F	(90)	(3)	(12)	(1)	(3)	(1)	(5)	(7)
	Irbid	0-4.99	M/F	837	1.6	8.3	0.2	0.7	0.0	1.1	6.6
	Mafraq	0-4.99	M/F	213	1.9	10.5	0.0	1.4	0.4	3.3	5.5

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Jarash	0-4.99	M/F	144	2.0	8.7	0.5	1.3	0.3	1.9	6.1
Ajloun	0-4.99	M/F	103	1.0	8.6	0.2	1.6	0.2	1.9	5.4
Karak	0-4.99	M/F	182	3.3	13.5	0.3	1.1	0.6	2.6	9.4
Tafila	0-4.99	M/F	(68)	(2)	(10)	(1)	(1)	(0)	(2)	(14)
Maán	0-4.99	M/F	(77)	(4)	(14)	(1)	(1)	(0)	(1)	(8)
Aqaba	0-4.99	M/F	(84)	(4)	(13)	(0)	(2)	(1)	(1)	(9)
Mother's education										
no education	0-4.99	M/F	(82)	(8)	(24)	(2)	(3)	(3)	(5)	(6)
primary**	0-4.99	M/F	858	2.8	10.6	0.0	2.2	0.2	3.2	5.9
secondary or higher	0-4.99	M/F	3094	1.3	6.8	0.2	1.3	0.1	1.4	6.6

* Category <-2 Z-scores includes <-3 Z-scores

** : primary education includes elementary (6 years) and preparatory (4 years)

Data based on WHO 2006 growth standards.

Data into brackets are based on small sample size and therefore must be interpreted with caution.

North region includes the Governorates of Irbid, Ajloun, Jarash, Matraq, Central region includes Balqa, Madaba, Amman, Zarqa. South region includes Karak, Tafila, Ma'an, Aqaba.

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Name of the survey: Jordan Population and Family Health Survey 2002 (DoS and ORC Macro, 2003)
Study population: Children under 5 years of age
Period of data collection: July - September 2002
Representativity: National
Norms of reference: WHO 2006 growth standards

Table A.5: Anthropometry of preschool children (cont'd)

Name/date of survey (month/year) (Reference)	Background characteristics	Age (years)	Sex	Sample size	Prevalence of malnutrition							
					Percentage of children with							
					Stunting Height-for-age		Wasting Weight-for-height		Underweight Weight-for-age		Overweight Weight-for-height	
< -3 Z-scores	< -2 Z-scores*	< -3 Z-scores	< -2 Z-scores*	< -3 Z-scores	< -2 Z-scores*	< -3 Z-scores	< -2 Z-scores*	> +2 Z-scores				
Jordan Population and Family Health Survey [JPFHS] 2002 (July-Sept. 2002) (WHO, Global database on child growth and malnutrition; DoS and ORC Macro, 2003)	Total	0-4.99	M/F	4678	2.6	12.0	0.8	2.5	0.7	3.6	4.7	
	Sex											
			0-4.99	M	2343	2.6	11.9	1.0	2.9	0.8	4.0	4.9
			0-4.99	F	2335	2.5	12.1	0.7	2.0	0.7	3.2	4.5
			Age									
			0-0.49	M/F	452	3.3	10.0	3.0	5.9	2.2	5.3	9.5
			0.5-0.99	M/F	570	3.2	9.6	0.3	3.2	0.4	2.4	5.7
			1-1.99	M/F	935	4.0	14.5	0.8	2.6	0.4	3.2	5.5
			2-2.99	M/F	958	2.7	13.8	0.3	1.7	0.6	3.8	3.1
			3-3.99	M/F	851	1.4	11.4	1.0	1.8	0.8	3.6	3.3
			4-4.99	M/F	912	1.3	10.5	0.6	1.6	0.6	3.7	3.9
			Residence									
		0-4.99	M/F	3573	2.1	10.3	0.9	2.4	0.7	3.0	4.9	
		0-4.99	M/F	1105	4.0	17.6	0.6	2.7	1.0	5.6	4.2	
		Region										
		0-4.99	M/F	1239	2.6	12.6	0.5	1.5	0.9	3.4	4.1	
		0-4.99	M/F	2917	2.2	11.0	0.9	2.7	0.6	3.2	5.1	
		0-4.99	M/F	521	4.2	16.2	1.1	3.3	1.5	6.1	3.9	
		Mother's education										
		0-4.99	M/F	190	n.a.	27.3	n.a.	5.5	n.a.	10.7	n.a.	
		0-4.99	M/F	1337	n.a.	15.2	n.a.	3.4	n.a.	4.8	n.a.	
		secondary or higher	M/F	3069	n.a.	9.7	n.a.	2.3	n.a.	3.1	n.a.	

* Category <-2 Z-scores includes <-3 Z-scores

** : primary education includes elementary (6 years) and preparatory (4 years)

Data based on WHO 2006 growth standards. Data come from the WHO database, except data desegregated by mother's education which are based on final report and converted with the algorithm developed by Yang and de Onis (Yang and de Onis, 2008).

n.a.: not available

North region includes the Governorates of Irbid, Ajloun, Jarash, Mafrq. Central region includes Balqa, Madaba, Amman, Zarqa. South region includes Karak, Tafila, Ma'an, Aqaba.

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Name of the survey: Jordan Population and Family Health Survey 1997 (DoS and Macro Int., 1998)
Study population: Children under 5 years of age
Period of data collection: June - October 1997
Representativity: National
Norms of reference: WHO 2006 growth standards

Table A.5: Anthropometry of preschool children (cont'd)

Name/date of survey (month/year) (Reference)	Background characteristics	Age (years)	Sex	Sample size	Prevalence of malnutrition								
					Stunting				Wasting				
					< -3 Z-scores	< -2 Z-scores*	< -2 Z-scores	< -3 Z-scores*	< -3 Z-scores	< -2 Z-scores*	< -2 Z-scores	< -3 Z-scores*	
Total		0-4.99	M/F	5651	2.6	11.1	0.6	2.4	0.8	3.8	4.4		
Sex													
Jordan Population and Family Health Survey [JPFHS] 1997 (June-Oct. 1997)		0-4.99	M	2866	3.2	11.9	0.4	2.3	0.8	3.9	4.9		
		0-4.99	F	2785	2.0	10.4	0.7	2.5	0.7	3.8	3.7		
Age													
		0-0.49	M/F	492	3.6	8.7	1.0	5.3	1.9	6.1	10.6		
		0.5-0.99	M/F	612	3.5	8.9	0.7	3.2	1.3	5.4	6.2		
		1-1.99	M/F	1164	3.3	13.4	0.3	2.2	0.7	2.3	4.6		
		2-2.99	M/F	1146	2.7	11.6	0.3	1.7	0.6	3.3	4.2		
		3-3.99	M/F	1178	1.8	11.7	0.6	1.6	0.2	3.9	2.5		
		4-4.99	M/F	1060	1.5	10.0	1.0	2.6	0.8	4.1	2.3		
Residence													
		0-4.99	M/F	4595	2.1	9.2	0.6	2.4	0.6	3.1	4.4		
		0-4.99	M/F	1056	4.7	19.5	0.6	2.6	1.7	7.0	4.3		
Region													
		0-4.99	M/F	1685	2.4	10.9	0.3	1.5	0.7	3.8	4.1		
		0-4.99	M/F	3597	2.5	10.5	0.7	2.8	0.7	3.6	4.4		
		0-4.99	M/F	369	4.2	18.3	0.9	2.7	1.2	5.9	5.0		
Mother's education													
		0-4.99	M/F	334	n.a.	26.0	n.a.	3.6	n.a.	11.6	n.a.		
		0-4.99	M/F	674	n.a.	15.2	n.a.	2.8	n.a.	6.5	n.a.		
		0-4.99	M/F	4485	n.a.	9.3	n.a.	2.4	n.a.	3.6	n.a.		

* Category <-2 Z-scores includes <-3 Z-scores

** : primary education includes elementary (6 years) and preparatory (4 years)

Data based on WHO 2006 growth standards. Data come from WHO Global database, except data desegregated by mother's education, which are based on final report and converted with the algorithm developed by Yang and de Onis (Yang and de Onis, 2008).

n.a.: not available

North region includes the Governorates of Irbid, Ajloun, Jarash, Mafrq. Central region includes Balqa, Madaba, Amman, Zarqa. South region includes Karak, Tafila, Ma'an, Aqaba.

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Name of the survey: Jordan Population and Family Health Survey 1990 (DoS et al., 1992)

Study population: Children under 5 years of age

Period of data collection: October - December 1990

Representativity: National

Norms of reference: WHO 2006 growth standards

Table A.5: Anthropometry of preschool children (cont'd)

Name/date of survey (month/year) (Reference)	Background characteristics	Age (years)	Sex	Sample size	Prevalence of malnutrition								
					Stunting				Wasting				
					Height-for-age		Weight-for-height		Weight-for-age		Weight-for-height		
< -3 Z-scores	< -2 Z-scores*	< -3 Z-scores	< -2 Z-scores*	< -3 Z-scores	< -2 Z-scores*	< -3 Z-scores	< -2 Z-scores*	< -3 Z-scores	< -2 Z-scores*				
Total		0-4.99	M/F	6601	5.7	20.5	1.3	3.8	1.0	4.8	8.6		
Sex													
Jordan Population and Family Health Survey [JPFHS] 1990 (Oct-Dec. 1990)		0-4.99	M	3307	6.6	22.0	1.7	4.6	1.2	5.2	9.7		
		0-4.99	F	3294	4.7	18.9	1.0	3.0	0.7	4.4	7.5		
Age													
		0-0.49	M/F	635	1.9	8.4	4.4	9.6	1.7	6.1	9.8		
		0.5-0.99	M/F	735	6.2	19.3	1.8	5.1	2.1	6.0	13.3		
		1-1.99	M/F	1393	7.6	25.9	0.8	2.4	1.0	3.3	11.2		
		2-2.99	M/F	1356	6.9	23.8	0.7	2.7	0.4	4.4	7.9		
		3-3.99	M/F	1354	5.7	21.5	0.8	3.6	0.8	5.3	6.4		
		4-4.99	M/F	1129	3.6	16.1	1.2	3.1	0.7	5.1	5.1		
Residence													
		0-4.99	M/F	4632	4.3	16.9	1.3	3.5	0.8	4.0	8.9		
		0-4.99	M/F	1969	9.0	28.8	1.5	4.6	1.3	6.7	7.9		
Governorate													
		0-4.99	M/F	2305	5.1	17.3	2.0	5.6	1.0	4.5	8.5		
		0-4.99	M/F	421	10.0	27.6	1.7	5.8	1.0	6.2	10.1		
		0-4.99	M/F	1827	4.9	20.7	0.9	2.2	1.0	4.2	8.6		
		0-4.99	M/F	1397	5.1	21.9	0.6	2.1	0.9	5.2	7.2		
		0-4.99	M/F	652	8.2	23.4	1.5	4.4	1.1	5.9	10.9		
Mother's education													
		0-4.99	M/F	1283	n.a.	35.0	n.a.	4.5	n.a.	9.4	n.a.		
		0-4.99	M/F	1423	n.a.	29.2	n.a.	3.4	n.a.	5.5	n.a.		
		0-4.99	M/F	3894	n.a.	19.6	n.a.	3.6	n.a.	4.5	n.a.		

* Category <2 Z-scores includes <3 Z-scores

Data based on WHO 2006 growth standards. Data come from WHO Global database, except data desegregated by mother's education, which are based on final report and converted with the algorithm developed by Yang and de Onis (Yang and de Onis, 2008).

n.a.: not available

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Name of the survey: National survey to assess Iodine Deficiency Disorders (IDD) among school children in Jordan (MoH, 2010, in collaboration with WHO)

Study population: Children 8-10 years

Period of data collection: 2010

Representativity: National

Table A.6: Prevalence of goitre and level of urinary iodine in school-age children

Survey name/date (Reference)	Background characteristics	Age (years)	Sex	Prevalence of goitre		Level of urinary iodine		
				Sample size	Percentage with goitre [Total Goitre]	Sample size	Median (µg/L)	Percentage with urinary iodine <100µg/L
National survey to assess iodine deficiency among school children in Jordan 2010 (MoH and WHO, 2010a)	Total	8-10.99	M/F	4598	4.9	4598	203	n.a
	Sex							
		8-10.99	M	1931	5.4	1931	n.a	n.a
		8-10.99	F	2667	4.5	2667	n.a	n.a
	Region							
	North	8-10.99	M/F	1500	4.3	1500	204	n.a
	Central	8-10.99	M/F	2351	5.6	2351	212	n.a
	South	8-10.99	M/F	747	3.9	747	177	n.a
	Governorates							
	Amman	8-10.99	M/F	1547	6.7	1547	215	n.a
	Balqa	8-10.99	M/F	204	6.4	204	199	n.a
	Zarka	8-10.99	M/F	433	2.8	433	201	n.a
	Madaba	8-10.99	M/F	167	2.4	167	225	n.a
	Irbid	8-10.99	M/F	579	3.6	579	195	n.a
	Mafrq	8-10.99	M/F	470	4.0	470	225	n.a
	Jarash	8-10.99	M/F	285	6.7	285	189	n.a
	Ajloun	8-10.99	M/F	166	3.0	166	187	n.a
	Karak	8-10.99	M/F	293	3.1	293	185	n.a
	Tafila	8-10.99	M/F	(62)	(2)	(62)	(167)	n.a
	Maán	8-10.99	M/F	194	5.2	194	165	n.a
Aqaba	8-10.99	M/F	198	4.5	198	184	n.a	

n.a.: not available

Central region includes: Amman, Balqa, Zarka and Madaba. North includes: Irbid, Mafrq, Jarash and Ajlune. South includes: Karak, Tafileh, Ma'an and Aqaba

Data into brackets are based on small sample size and therefore must be interpreted with caution.

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Name of the survey: Assessment of iodine deficiency status among Jordanian children after introduction of iodized salt (MoH et al., 2000)

Study population: Children 8-10 years

Period of data collection: 2000

Representativity: National

Table A.6: Prevalence of goitre and level of urinary iodine in school-age children (cont'd)

Survey name/date (Reference)	Background characteristics	Age (years)	Sex	Prevalence of goitre		Level of urinary iodine			
				Sample size	Percentage with goitre [Total Goitre]	Sample size	Median (µg/L)	Percentage with urinary iodine <100µg/L	
Assessment of iodine deficiency status among Jordanian children after introduction of iodized salt 2000 (MoH et al., 2000; WHO, Database on iodine deficiency, 2011)	Total	8-10.99	M/F	2601	33.5	2601	154	24.5	
	Sex								
		8-10.99	M	1455	36.6	n.a	n.a	n.a	
		8-10.99	F	1146	29.7	n.a	n.a	n.a	
	Region								
	North	8-10.99	M/F	741	47.0	741	120	32.5	
	Central	8-10.99	M/F	1550	26.3	1550	164	21.8	
	South	8-10.99	M/F	310	38.1	310	188	18.2	
	Governorates								
	Amman	8-10.99	M/F	832	28.4	832	167	20.6	
	Balqa	8-10.99	M/F	193	38.3	193	135	38.0	
	Zarqa	8-10.99	M/F	448	17.9	448	170	18.3	
	Madaba	8-10.99	M/F	(77)	(22)	(77)	141	(14)	
	Irbid	8-10.99	M/F	450	51.1	450	150	26.1	
	Mafraq	8-10.99	M/F	133	36.1	133	110	44.0	
	Jarash	8-10.99	M/F	(86)	(14)	(86)	(91)	(60)	
	Ajloun	8-10.99	M/F	(72)	(79)	(72)	(120)	(18)	
	Karak	8-10.99	M/F	118	48.3	118	181	20.8	
	Tafiela	8-10.99	M/F	(59)	(42)	(59)	(169)	(12)	
Maán	8-10.99	M/F	(68)	(34)	(68)	(219)	(14)		
Aqaba	8-10.99	M/F	(65)	(20)	(65)	(263)	(24)		

n.a: not available

Data into brackets are based on small sample size and therefore must be interpreted with caution. Central region includes: Amman, Balqa, Zarka and Madaba. North includes: Irbid, Mafraq, Jarash and Ajlune. South includes: Karak, Tafiela, Ma'an and Aqaba.

Name of the survey: Study of iodine deficiency in Jordan 1993 (MoH, WHO, UNICEF, 1993)

Study population: Children 8-10 years

Period of data collection: 1993

Representativity: National, but includes only 8 Governorates on 12

Table A.6: Prevalence of goitre and level of urinary iodine in school-age children (cont'd)

Survey name/date (Reference)	Background characteristics	Age (years)	Sex	Prevalence of goitre		Level of urinary iodine		
				Sample size	Percentage with goitre [Total Goitre]	Sample size	Median (µg/L)	Percentage with urinary iodine <100µg/L
(MoH et al., 1993; WHO, Database on iodine deficiency, 2011)	Total	8-10.99	M/F	2457	37.7	272	40.0	n.a.
	Sex							
		8-10.99	M	1286	36.3	148	42.8	n.a.
		8-10.99	F	1171	39.2	112	38.0	n.a.
	Residence							
	urban	8-10.99	M/F	1571	33.6	162	45.4	n.a.
	rural	8-10.99	M/F	886	44.9	[98]	30.2	n.a.
	Region							
	North	8-10.99	M/F	727	48.6	[81]	25.6	n.a.
	Central	8-10.99	M/F	1479	30.6	152	48.7	n.a.
	South	8-10.99	M/F	252	48.0	—	—	n.a.
	Governorates							
	Amman	8-10.99	M/F	923	33.7	101	48.4	n.a.
	Balqa	8-10.99	M/F	157	43.9	—	—	n.a.
	Zarqa	8-10.99	M/F	398	18.1	—	—	n.a.
	Irbid	8-10.99	M/F	626	54.6	(74)	(21.6)	n.a.
Ma'raq	8-10.99	M/F	101	10.9	—	—	n.a.	
Karak	8-10.99	M/F	113	22.1	—	—	n.a.	
Tafiela	8-10.99	M/F	—	—	—	—	n.a.	
Maán	8-10.99	M/F	(93)	65.6	—	—	n.a.	

n.a: not available

Data into brackets are based on small sample size (between 50 and 100) and therefore must be interpreted with caution. If sample size is <50, data are not shown. This survey includes only 8 governorates. Middle region includes Amman, Balqa and Zarka, North includes: Irbid and Ma'raq, South includes Karak, Tafiela and Ma'an. Madaba (Middle region), Jarash and Ajlune (North region), and Aqaba (South region) were not included in this survey.

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Name of the survey: National survey to assess Iodine Deficiency Disorders (IDD) among school children in Jordan (MoH and WHO, 2010a)

Study population: Households

Period of data collection: 2010

Representativity: National

Table A.7: Iodization of salt at household level

Survey name/date (Reference)	Background characteristics	Number of households where salt was available for testing	Iodine level of household salt		Percentage of households tested
			Inadequate (<15 ppm)	Adequate (≥15 ppm)	
(MoH and WHO, 2010a)	Total	4598	3.7	96.3	100
	Governorates				
	Amman	1547	4.1	95.9	100
	Balqa	204	0.0	100.0	100
	Zarqa	433	1.2	98.8	100
	Madaba	167	1.8	98.2	100
	Irbid	579	3.8	96.2	100
	Ma'raq	470	12.8	87.2	100
	Jarash	285	1.4	98.6	100
	Ajloun	166	1.2	98.8	100
	Karak	293	2.0	98.0	100
	Tafileh	(62)	(0)	(100)	(100)
	Maán	194	3.1	96.9	100
Aqaba	198	0.0	100.0	100	

Note: ppm = parts per million. Data into brackets are based on small sample size (between 50 and 100) and therefore must be interpreted with caution. Central region includes: Amman, Balqa, Zarka and Madaba. North includes: Irbid, Ma'raq, Jarash and Ajlune. South includes: Karak, Tafileh, Ma'an and Aqaba

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Name of the survey: Micronutrient Survey 2010 (MoH et al. 2011)

Study population: Children 1-4.99 years

Period of data collection: March - April 2010

Representativity: National

Table A.8: Prevalence of sub-clinical vitamin A deficiency in children from 1 to 5 years

Survey name/date (Reference)	Background characteristics	Age (years)	Sex	Prevalence of low level of serum retinol	
				Sample size	Percentage with serum retinol <20 µg/dL or 0.70 µmol/L
Micronutrient Survey 2010 (Mar. - Apr. 2010) (MoH et al., 2011)	Total	1-4.99	M/F	915	18.3
	Sex				
		1-4.99	M	472	20.8
		1-4.99	F	443	15.6
	Age				
		1-1.99	M/F	219	19.7
		2-2.99	M/F	212	17.7
		3-3.99	M/F	221	16.5
		4-4.99	M/F	263	19.0
	Residence				
	urban	1-4.99	M/F	721	19.3
	rural	1-4.99	M/F	194	14.3
	Region				
	North	1-4.99	M/F	311	20.8
	Central	1-4.99	M/F	515	16.7
South	1-4.99	M/F	(89)	(18)	

Data into brackets are based on small sample size and therefore must be interpreted with caution. Central region includes: Amman, Balqa, Zarka and Madaba. North includes: Irbid, Mafraq, Jarash and Ajlune. South includes: Karak, Tafleeh, Ma'an and Aqaba

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Name of the survey: National baseline survey on iron deficiency anemia and vitamin A deficiency (MoH et al., 2002)

Study population: Children 1-4.99 years

Period of data collection: 2002

Representativity: National

Table A.8: Prevalence of sub-clinical vitamin A deficiency in children from 1 to 5 years (cont'd)

Survey name/date (Reference)	Background characteristics	Age (years)	Sex	Prevalence of low level of serum retinol	
				Sample size	Percentage with serum retinol <20 µg/dL or 0.70 µmol/L
National baseline survey on iron deficiency anemia and vitamin A deficiency 2002 (MoH et al., 2002; WHO, Database on vitamin A deficiency, 2011)	Total	1-4.99	M/F	1036	15.1
	Sex				
		1-4.99	M	514	16.0
		1-4.99	F	513	14.4
	Residence				
	urban	1-4.99	M/F	670	14.6
	rural	1-4.99	M/F	358	17.0
	Region				
	North	1-4.99	M/F	310	18.3
	Central	1-4.99	M/F	446	12.4
	South	1-4.99	M/F	272	21.8
	Governorates				
	Amman	1-4.99	M/F	159	9.2
	Balqa	1-4.99	M/F	104	25.3
	Zarqa	1-4.99	M/F	139	12.7
	Madaba	1-4.99	M/F	-	-
	Irbid	1-4.99	M/F	141	14.6
	Mafraq	1-4.99	M/F	(57)	(22)
	Jarash	1-4.99	M/F	(70)	(34)
	Ajloun	1-4.99	M/F	-	-
	Karak	1-4.99	M/F	(79)	(23)
	Tafiela	1-4.99	M/F	(57)	(9)
Maán	1-4.99	M/F	(79)	(16)	
Aqaba	1-4.99	M/F	(57)	(32)	

Data into brackets are based on small sample size (between 50 and 100) and therefore must be interpreted with caution. If sample size is <50, data are not shown (-). Central region includes: Amman, Balqa, Zarka and Madaba. North includes: Irbid, Mafraq, Jarash and Ajlune. South includes: Karak, Tafleeh, Ma'an and Aqaba

Name of the survey: Jordan Population and Family Health Survey 2007 (DoS and Macro Int. Inc, 2008)

Study population: Youngest children 6-35 months

Period of data collection: June-November 2007

Representativity: National

Table A.9: Percentage of children who consumed foods rich in vitamin A and foods rich in bioavailable iron in the 24 hours preceding the survey

Survey name/date (Reference)	Background characteristics	Age (months)	Sample size	Percentage of children who consumed	
				Foods rich in vitamin A ¹	Foods rich in bioavailable iron ²
Jordan Population and Family Health Survey [JPFHS] 2007 (June-Nov. 2007) (DoS and Macro Int. Inc, 2008)	Total	6-35	3775	83.5	72.1
	Sex				
	M	6-35	1898	82.6	72.3
	F	6-35	1876	84.4	71.8
	Residence				
	urban	6-35	3165	84.5	73.2
	rural	6-35	610	78.4	66.3
	Breastfeeding status				
	Breastfed	6-35	1180	69.2	54.5
	Non-breastfed	6-35	2594	90.0	80.0
	Region				
	North	6-35	1107	82.1	70.2
	Central	6-35	2332	84.8	73.7
	South	6-35	335	79.5	66.4
	Governorates				
	Amman	6-35	1459	85.3	73.4
	Balqa	6-35	222	82.8	69.7
	Zarqa	6-35	560	85.1	77.5
	Madaba	6-35	(90)	(79)	(66)
	Irbid	6-35	738	83.0	71.0
	Mafraq	6-35	172	76.7	61.4
	Jarash	6-35	114	81.8	72.0
	Ajloun	6-35	(84)	(86)	(79)
	Karak	6-35	128	85.6	67.6
	Tafiela	6-35	(53)	(79)	(69)
	Maán	6-35	(67)	(77)	(67)
	Aqaba	6-35	(88)	(73)	(63)

¹ List of food products taken into account: meat, fish, poultry, eggs, carrots, red sweet potatoes, pumpkin, apricot, palm nuts, yellow melon, and green leafy vegetables.

² List of food products taken into account: meat, fish, poultry, and eggs.

Data into brackets are based on small sample size and therefore must be interpreted with caution.

North region includes the Governorates of Irbid, Ajloun, Jarash, Mafraq. Central region includes Balqa, Madaba, Amman, Zarqa. South region includes Karak, Tafiela, Ma'an, Aqaba.

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Name of the survey: Jordan Population and Family Health Survey 2007 (DoS and Macro Int. Inc, 2008)

Study population: Children 6-59 months of age

Period of data collection: June-November 2007

Representativity: National

Table A.10: Vitamin A supplementation of children

Survey name/date (Reference)	Background characteristics	Children			
		Age (months)	Sex	Number of children	Percent of children who received vit. A supplements in the 6 months preceding the survey
Jordan Population and Family Health Survey [JPFHS] 2007 (June-Nov. 2007) (DoS and Macro Int. Inc, 2008)	Total	6-59	M/F	8607	8.5
	Sex				
		6-59	M	4357	9.1
		6-59	F	4250	7.9
	Residence				
	urban	6-59	M/F	7223	8.7
	rural	6-59	M/F	1384	7.6
	Region				
	North	6-59	M/F	2502	5.3
	Central	6-59	M/F	5348	10.1
	South	6-59	M/F	758	8.3
	Governorates				
	Amman	6-59	M/F	3277	9.6
	Balqa	6-59	M/F	536	6.2
	Zarqa	6-59	M/F	1325	13.0
	Madaba	6-59	M/F	209	10.1
	Irbid	6-59	M/F	1629	5.6
	Mafraq	6-59	M/F	416	4.8
	Jarash	6-59	M/F	254	5.8
	Ajloun	6-59	M/F	204	3.3
Karak	6-59	M/F	296	8.8	
Tafiela	6-59	M/F	122	9.2	
Ma'an	6-59	M/F	146	9.6	
Aqaba	6-59	M/F	195	5.9	

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Name of the survey: Micronutrient Survey 2010 (MoH et al., 2011)

Study population: Children 12-59 months of age

Period of data collection: March-April 2010

Representativity: National

Methodology: automated CBC blood counter / venous blood used

Table A.11: Prevalence of anemia in preschool children

Survey name/date (Reference)	Background characteristics	Age (months)	Sex	Percentage of children with					
				Sample size	Any anemia (Hb<11.0 g/dL)	Sample size	Iron deficiency (serum ferritin <12.0 µg/L)	Sample size	Iron deficiency anemia (Hb<11.0 g/dL and serum ferritin <12.0 µg/L)
Micronutrient survey 2010 (Mar.-Apr. 2010) (MoH et al., 2011)	Total	12-59	M/F	902	17.0	940	13.7	898	4.8
	Sex								
		12-59	M	468	19.3	485	14.7	465	6.2
		12-59	F	434	14.6	455	12.6	433	3.4
	Age								
		12-23	M/F	214	27.6	226	19.1	213	8.9
		24-35	M/F	214	21.8	220	16.7	213	6.7
		36-47	M/F	212	12.1	227	9.6	211	1.5
		48-59	M/F	262	8.6	267	10.0	261	2.7
	Residence								
	urban	12-59	M/F	715	15.6	739	14.3	712	4.3
	rural	12-59	M/F	187	23.1	201	11.1	186	6.8
	Regions								
	North	12-59	M/F	310	18.1	323	13.7	310	6.7
	Central	12-59	M/F	508	16.0	528	14.7	504	3.6
South	12-59	M/F	(84)	(19)	(89)	(6)	(84)	(5)	

North region includes the Governorates of Irbid, Ajloun, Jarash, Mafraq. Central region includes Balqa, Madaba, Amman, Zarqa. South region includes Karak, Tafiela, Ma'an, Aqaba. Data into brackets are based on small sample size and therefore must be interpreted with caution.

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Name of the survey: Jordan Population and Family Health Survey 2009 (DoS and ICF Macro, 2010)

Study population: Children 6-59 months of age

Period of data collection: October-December 2009

Representativity: National

Methodology: HemoCue system

Table A.11: Prevalence of anemia in preschool children (cont'd)

Survey name/date (Reference)	Background characteristics	Age (months)	Sex	Sample size	Percentage of children with	
					Any anemia (Hb<11.0 g/dL)	Severe anemia (Hb<7.0 g/dL)
Jordan Population and Family Health Survey [JPFHS] 2009 (Oct. – Dec. 2009) (DoS and ICF Macro, 2010)	Total	6-59	M/F	3454	33.9	0.0
	Sex					
		6-59	M	1811	33.8	0.0
		6-59	F	1643	34.1	0.0
	Age					
		6-11	M/F	399	53.1	0.1
		12-23	M/F	830	48.2	0.1
		24-35	M/F	813	28.3	0.0
		36-47	M/F	723	24.4	0.0
		48-59	M/F	688	22.3	0.0
	Residence					
	urban	6-59	M/F	2835	32.6	0.0
	rural	6-59	M/F	619	39.8	0.1
	Region					
	North	6-59	M/F	1123	36.1	0.0
	Central	6-59	M/F	1977	31.4	0.0
	South	6-59	M/F	354	40.8	0.2
	Governorates					
	Amman	6-59	M/F	1161	31.8	0.0
	Balqa	6-59	M/F	225	39.2	0.0
	Zarqa	6-59	M/F	513	28.4	0.0
	Madaba	6-59	M/F	[78]	[24]	[0]
	Irbid	6-59	M/F	740	38.3	0.0
Mafraq	6-59	M/F	172	26.9	0.0	
Jarash	6-59	M/F	125	36.1	0.0	
Ajloun	6-59	M/F	[86]	[36]	[0]	
Karak	6-59	M/F	155	45.3	0.3	
Tafiela	6-59	M/F	[57]	[38]	[0]	
Ma'an	6-59	M/F	[69]	[43]	[0]	
Aqaba	6-59	M/F	[74]	[32]	[0]	

Hb: Hemoglobin

Data into brackets are based on small sample size and therefore must be interpreted with caution.

North region includes the Governorates of Irbid, Ajloun, Jarash, Mafraq. Central region includes Balqa, Madaba, Amman, Zarqa.

South region includes Karak, Tafiela, Ma'an, Aqaba.

Name of the survey: Jordan Population and Family Health Survey 2002 (DoS and ORC Macro, 2003)

Study population: Children 6-59 months of age

Period of data collection: July-September 2002

Representativity: National

Methodology: HemoCue system

Table A.11: Prevalence of anemia in preschool children (cont'd)

Survey name/date (Reference)	Background characteristics	Age (months)	Sex	Sample size	Percentage of children with	
					Any anemia (Hb<11.0 g/dL)	Severe anemia (Hb<7.0 g/dL)
Jordan Population and Family Health Survey [JPFHS] 2002 (July – Sept. 2002) (DoS and ORC Macro, 2003)	Total	6-59	M/F	1503	34.2	0.2
	Sex					
		6-59	M	788	37.3	0.2
		6-59	F	715	30.8	0.3
	Age					
		6-11	M/F	223	52.7	0.3
		12-23	M/F	326	51.0	0.6
		24-35	M/F	349	31.2	0.0
		36-47	M/F	284	22.2	0.2
		48-59	M/F	321	18.1	0.1
	Residence					
	urban	6-59	M/F	1139	32.4	0.1
	rural	6-59	M/F	364	39.9	0.5
	Region					
	North	6-59	M/F	398	34.0	0.0
	Central	6-59	M/F	968	34.5	0.3
South	6-59	M/F	137	33.1	0.2	

Hb: Hemoglobin

North region includes the Governorates of Irbid, Ajloun, Jarash, Mafraq. Central region includes Balqa, Madaba, Amman, Zarqa.

South region includes Karak, Tafila, Ma'an, Aqaba.

Name of the survey: National baseline survey on iron deficiency anemia and Vitamin A deficiency (MoH et al., 2002)

Study population: Children 12-59 months of age

Period of data collection: 2002

Representativity: National

Methodology: automated CBC blood counter / venous blood used.

Table A.11: Prevalence of anemia in preschool children (cont'd)

Survey name/date (Reference)	Background characteristics	Age (months)	Sex	Sample size	Percentage of children with	
					Any anemia (Hb<11.0 g/dL)	Severe anemia (Hb<7.0 g/dL)
National baseline survey on iron deficiency anemia and Vitamin A deficiency 2002 (MoH et al., 2002; WHO, Database on anaemia, 2011)	Total	12-59	M/F	1070	20.1	n.a.
	Sex					
		12-59	M	529	22.1	n.a.
		12-59	F	531	18.1	n.a.
	Age					
		12-23	M/F	245	34.4	n.a.
		24-35	M/F	258	23.3	n.a.
		36-47	M/F	281	13.2	n.a.
		48-59	M/F	276	10.6	n.a.
	Residence					
	urban	12-59	M/F	695	19.4	n.a.
	rural	12-59	M/F	366	22.4	n.a.
	Region					
	North	12-59	M/F	316	30.0	n.a.
	Central	12-59	M/F	464	14.9	n.a.
	South	12-59	M/F	281	23.4	n.a.

Hb: Hemoglobin

n.a.: not available

Central region includes: Amman, Balqa, Zarka and Madaba. North includes: Irbid, Mafraq, Jarash and Ajlune. South includes: Karak, Tafleeh, Ma'an and Aqaba

Appendix III: Women's nutritional status

Name of the survey: Jordan Population and Family Health Survey 2009 (DoS and ICF Macro, 2010)
Study population: All women aged 15-49 - pregnant women and women with a birth in the 2 preceding months excluded
Period of data collection: October - December 2009
Representativity: National

Table A.12: Anthropometry of adult women

Name/date of survey (month/year) (Reference)	Background characteristics	Age (years)	Sample size	Anthropometry of adult women					
				Body Mass Index (kg/m ²) (BMI)					
				Mean (kg/m ²)	<18.5 (chronic energy deficiency)	18.5-24.9 (normal)	25.0-29.9 (overweight)	≥30.0 (obesity)	
Jordan Population and Family Health Survey [JPFHS] 2009 (Oct.-Dec. 2009)	Total	15-49	6666	27.0	3.9	39.6	27.8	28.7	
	Age								
		15-19	523	23.8	6.4	64.0	19.8	9.7	
		20-29	1767	25.4	5.6	49.2	27.6	17.6	
		30-39	2101	27.7	2.5	32.4	35.3	29.8	
		40-49	2275	28.4	3.3	33.2	22.9	40.6	
	Residence								
		urban	15-49	5526	27.0	4.0	39.9	27.9	28.3
		rural	15-49	1140	27.2	3.7	38.4	27.5	30.5
	Region								
	North	15-49	2053	27.2	3.4	39.3	27.1	30.2	
	Central	15-49	3992	26.8	4.2	40.3	28.3	27.2	
	South	15-49	620	27.6	3.6	36.3	27.1	33.0	
Governorates									
	Amman	15-49	2502	26.6	4.0	40.9	29.7	25.5	
	Balqa	15-49	451	26.5	6.2	43.9	20.1	29.8	
	Zarqa	15-49	889	27.3	3.9	37.1	28.0	30.9	
	Madaba	15-49	150	26.7	4.7	38.2	31.2	26.0	
	Irbid	15-49	1367	27.1	3.3	40.8	26.0	29.9	
	Ma'raaq	15-49	320	27.7	3.3	35.1	29.2	32.4	
	Jarash	15-49	197	27.5	3.2	37.5	27.8	31.5	
	Ajloun	15-49	169	26.8	4.2	37.9	31.1	26.9	
	Karak	15-49	283	27.6	3.7	35.2	27.0	34.1	
	Tafila	15-49	107	27.6	3.5	35.4	29.3	31.8	
	Ma'a'n	15-49	117	27.4	2.8	41.8	24.2	31.1	
	Aqaba	15-49	113	28.0	4.5	34.1	28.0	33.4	
Education's level									
	no education	15-49	162	29.1	2.0	34.0	20.1	43.9	
	primary*	15-49	1530	28.2	5.3	32.0	23.2	39.6	
	secondary or higher	15-49	4974	26.6	3.6	42.2	29.5	24.8	

*: primary education includes elementary (6 years) and preparatory (4 years)

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Name of the survey: Jordan Population and Family Health Survey 2007 (DoS and Macro Int. Inc, 2008)
Study population: All women aged 15-49 - pregnant women and women with a birth in the 2 preceding months excluded
Period of data collection: June-November 2007
Representativity: National

Table A.12: Anthropometry of adult women (cont'd)

Name/date of survey (month/year) (Reference)	Background characteristics	Age (years)	Anthropometry of adult women					
			Sample size	Body Mass Index (kg/m ²) (BMI)		Percentage of women with BMI		
				Mean (kg/m ²)	<18.5 (chronic energy deficiency)	18.5-24.9 (normal)	25.0-29.9 (overweight)	≥30.0 (obesity)
	Total	15-49	7759	25.8	3.9	48.6	27.4	20.1
Jordan Population and Family Health Survey [JPFHS] 2007 (June-Nov. 2007)	Age							
		15-19	675	23.0	7.3	71.2	15.7	5.7
		20-29	2209	24.3	3.7	60.9	23.3	12.1
		30-39	2511	26.4	3.4	41.4	33.1	22.2
		40-49	2364	27.3	3.7	38.2	28.4	29.7
(DoS and Macro Int. Inc, 2008)	Residence							
		15-49	6418	25.7	3.9	49.3	27.2	19.7
		15-49	1341	26.3	4.0	45.3	28.2	22.4
	Region							
		15-49	2131	26.7	4.1	42.3	26.6	27.0
		15-49	4815	25.4	3.7	51.9	27.3	17.1
		15-49	813	26.0	4.6	45.3	29.6	20.5
	Governorates							
		15-49	2993	25.4	3.9	51.2	27.8	17.2
		15-49	491	25.6	5.1	51.7	21.7	21.5
		15-49	1129	25.0	2.9	56.2	27.8	13.1
		15-49	202	26.8	2.6	39.8	30.7	26.9
		15-49	1414	27.0	3.9	41.2	26.3	28.5
		15-49	327	26.5	5.5	40.2	28.3	25.9
		15-49	233	25.4	4.2	52.7	24.6	18.4
		15-49	157	27.0	3.3	40.4	28.5	27.8
		15-49	358	26.0	4.6	44.9	30.4	20.2
		15-49	131	26.8	2.0	43.1	29.9	24.9
		15-49	140	25.7	5.3	46.4	27.8	20.5
		15-49	183	25.6	6.1	46.7	29.1	18.1
	Education's level							
		15-49	266	29.2	2.7	24.1	35.6	37.7
		15-49	1636	27.8	3.8	35.3	27.8	33.1
		15-49	5852	25.1	4.1	53.4	26.9	15.8

*: primary education includes elementary (6 years) and preparatory (4 years)

Name of the survey: Jordan Population and Family Health Survey 2002 (DoS and ORC Macro, 2003)
Study population: All women aged 15-49 - pregnant women and women with a birth in the 2 preceding months excluded
Period of data collection: July-September 2002
Representativity: National

Table A.12: Anthropometry of adult women (cont'd)

Name/date of survey (month/year) (Reference)	Background characteristics	Age (years)	Sample size	Mean (kg/m ²)	Anthropometry of adult women			
					Body Mass Index (kg/m ²) (BMI)			
					<18.5 (chronic energy deficiency)	18.5-24.9 (normal)	25.0-29.9 (overweight)	≥30.0 (obesity)
Jordan Population and Family Health Survey [JPFHS] 2002 (July-Sept. 2002)	Total	15-49	7681	26.6	5.1	41.1	27.6	26.3
	Age							
		15-19	1729	22.4	12.7	66.7	15.3	5.4
		20-29	2383	24.9	4.9	53.1	29.0	13.0
		30-39	2171	28.5	2.0	26.5	35.0	36.4
	40-49	1397	31.6	0.6	11.6	28.8	58.9	
(DoS and ORC Macro, 2003)	Residence							
		15-49	6018	26.7	4.9	40.7	28.1	26.3
		15-49	1663	26.3	5.5	42.5	25.8	26.2
Region								
		15-49	2083	26.8	4.4	40.7	27.3	27.6
		15-49	4814	26.5	5.1	41.4	27.8	25.7
		15-49	784	26.5	6.4	40.6	26.8	26.2
Education's level								
		15-49	352	29.8	4.4	19.7	27.0	48.9
		15-49	2208	28.6	3.3	30.2	28.1	38.5
		15-49	5121	25.5	5.8	47.3	27.4	19.4

*: primary education includes elementary (6 years) and preparatory (4 years)

Name of the survey: Micronutrient Survey 2010 (MoH et al. 2011)

Study population: All non-pregnant women aged 15-49 years

Period of data collection: March-April 2010

Representativity: National

Table A.13: Prevalence of sub-clinical vitamin A deficiency in women

Survey name/date (Reference)	Background characteristics	Age (years)	Prevalence of low level of serum retinol	
			Sample size	Percentage with serum retinol <20 µg/dL or 0.70 µmol/L
Micronutrient survey 2010 (Mar.-April 2010) (MoH et al., 2011)	Total	15-49	2032	4.8
	Age			
		15-19	482	6.3
		20-29	513	7.6
		30-39	521	3.2
		40-49	516	2.5
	Residence			
	urban	15-49	1611	4.6
	rural	15-49	421	5.8
	Region			
	North	15-49	683	4.0
	Central	15-49	1133	5.0
	South	15-49	216	1.0
	Educational level			
	No formal education	15-49	(95)	(4)
Primary	15-49	1008	4.7	
Secondary or higher	15-49	927	5.0	

Data into brackets are based on small sample size and therefore must be interpreted with caution.

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Name of the survey: Micronutrient Survey 2010 (MoH et al. 2011)

Study population: All non-pregnant women aged 15-49 years

Period of data collection: March-April 2010

Representativity: National

Table A.14: Prevalence of anemia in women of childbearing age

Survey name/date (Reference)	Background characteristics	Age (years)	Percentage of women with					
			Sample size	Any anemia (non pregnant women Hb<12.0 g/dL)	Sample size	Iron deficiency (serum ferritin <15.0 µg/L)	Sample size	Iron deficiency anemia (Hb< 12.0 g/dL and serum ferritin <15.0 µg/L)
Micronutrient survey 2010 (Mar-Apr. 2010) (MoH et al., 2011)	Total	15-49	2030	30.6	2035	35.1	2,026	19.8
	Age							
		15-19	481	25.3	484	31.5	481	15.4
		20-29	515	28.2	514	36.9	514	18.6
		30-39	521	33.8	521	37.9	519	21.5
		40-49	513	34.6	516	33.8	512	23.2
	Residence							
	urban	15-49	1610	30.4	1613	34.2	1,606	19.2
	rural	15-49	420	31.4	422	38.8	420	22.0
	Regions							
	North	15-49	684	31.7	684	37.3	684	20.6
	Central	15-49	1131	28.6	1135	33.9	1,127	18.5
	South	15-49	215	40.6	216	33.9	215	25.2
	Educational Level							
	No formal education	15-49	(96)	(35)	(97)	(35)	(96)	(20)
	Basic	15-49	1006	29.2	1009	33.6	1004	18.4
	Secondary or higher	15-49	925	31.7	927	36.4	924	21.1

Hb: Hemoglobin; Data into brackets are based on small sample size and therefore must be interpreted with caution.

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Name of the survey: Jordan Population and Family Health Survey 2009 (DoS and ICF Macro, 2010)
Study population: All women aged 15-49, ever-married women for pregnancy/breastfeeding status
Period of data collection: October - December 2009
Representativity: National

Table A.14: Prevalence of anemia in women of childbearing age (cont'd)

Survey name/date (Reference)	Background characteristics	Age (years)	Sample size	Percentage of women with		
				Any anaemia (pregnant women Hb<11.0 g/dL; non pregnant women Hb<12.0 g/dL)	Severe anaemia (all women Hb<7.0 g/dL)	
Jordan Population and Family Health Survey [JPFHS] 2009 (Oct. – Dec. 2009) (DoS and ICF Macro, 2010)	Total	15-49	7043	25.4	0.1	
	Age					
		15-19	1501	20.1	0.0	
		20-29	2167	22.7	0.2	
		30-39	1913	27.5	0.2	
		40-49	1462	32.0	0.2	
	Pregnancy/Breastfeeding status*					
		Pregnant	15-49	511	25.5	0.5
		Breastfeeding	15-49	884	28.3	0.0
		Non-pregnant/ Non-breastfeeding	15-49	3074	31.1	0.1
	Residence					
		urban	15-49	5830	24.7	0.1
		rural	15-49	1212	28.7	0.3
	Region					
		North	15-49	2178	26.5	0.2
		Central	15-49	4200	24.2	0.1
		South	15-49	664	29.7	0.2
	Governorates					
		Amman	15-49	2607	22.7	0.0
		Balqa	15-49	478	34.4	0.7
		Zarqa	15-49	953	23.5	0.0
		Madaba	15-49	163	21.4	0.0
		Irbid	15-49	1468	26.8	0.1
		Mafrq	15-49	322	23.3	0.3
		Jarash	15-49	207	29.6	0.4
		Ajloun	15-49	182	26.1	0.5
		Karak	15-49	298	30.3	0.2
	Tafiela	15-49	114	24.0	0.3	
	Maán	15-49	128	28.5	0.2	
	Aqaba	15-49	124	35.0	0.0	

Hb: Hemoglobin

*: prevalence estimated among ever-married women only

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Name of the survey: Jordan Population and Family Health Survey 2002 (DoS and ORC Macro, 2003)

Study population: All women aged 15-49, ever-married women for pregnancy/breastfeeding status

Period of data collection: July – September 2002

Representativity: National

Table A.14: Prevalence of anemia in women of childbearing age (cont'd)

Survey name/date (Reference)	Background characteristics	Age (years)	Sample size	Percentage of women with		
				Any anaemia (pregnant women Hb<11.0 g/dL; non pregnant women Hb<12.0 g/dL)	Severe anaemia (all women Hb<7.0 g/dL)	
Jordan Population and Family Health Survey [JPFHS] 2002 (July – Sept. 2002) (DoS and ORC Macro, 2003)	Total	15-49	2900	26.3	0.3	
	Age					
		15-19	632	20.0	0.3	
		20-29	999	26.1	0.0	
		30-39	825	28.0	0.7	
		40-49	444	32.4	0.2	
	Pregnancy/Breastfeeding status*					
		Pregnant	15-49	228	37.0	0.1
		Breastfeeding	15-49	386	27.4	0.0
		Non-pregnant/ Non-breastfeeding	15-49	1236	28.2	0.2
	Residence					
		urban	15-49	2255	25.6	0.1
		rural	15-49	645	28.7	0.8
	Region					
		North	15-49	768	29.2	0.4
	Central	15-49	1870	25.0	0.2	
	South	15-49	262	27.0	0.2	

Hb: Hemoglobin

*: prevalence estimated among ever-married women only

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Name of the survey: Jordan Population and Family Health Survey 2007 (DoS and Macro Int. Inc, 2008)

Study population: Mothers of children under 3 years of age

Period of data collection: June-November 2007

Representativity: National

Table A.15: Percentage of mothers having consumed foods rich in vitamin A and foods rich in bioavailable iron in the 24 hours preceding the survey

Survey name/date (Reference)	Background characteristics	Age (years)	Sample size	Percentage of mothers having consumed	
				Vitamin A-rich foods ¹	Foods rich in bioavailable iron ²
Jordan Population and Family Health Survey [JPFHS] 2007 (June-Nov. 2007) (DoS and Macro Int. Inc, 2008)	Total	15-49	4821	92.9	84.0
	Residence				
	urban	15-49	4024	93.2	84.6
	rural	15-49	796	90.9	80.9
	Region				
	North	15-49	1412	94.5	85.8
	Central	15-49	2978	92.6	84.0
	South	15-49	431	89.0	78.0
	Governorates				
	Amman	15-49	1871	93.8	84.6
	Balqa	15-49	288	90.8	82.8
	Zarqa	15-49	701	90.9	84.2
	Madaba	15-49	118	88.5	75.8
	Irbid	15-49	934	96.0	87.6
	Mafraq	15-49	224	89.2	77.4
	Jarash	15-49	146	92.7	85.1
	Ajloun	15-49	108	95.4	89.0
	Karak	15-49	170	92.7	79.6
	Tafiela	15-49	(68)	(89)	(79)
	Maán	15-49	(85)	(86)	(75)
Aqaba	15-49	108	85.5	77.2	

Sample comprises mothers of children under age three years.

¹ includes meat, fish, poultry, eggs, carrots, red sweet potatoes, pumpkin, apricot, palm nuts, yellow melon, and green leafy vegetables

² includes meat, fish, poultry, and eggs

Data into brackets are based on small sample size and therefore must be interpreted with caution.

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Name of the survey: Jordan Population and Family Health Survey 2009 (DoS and ICF Macro, 2010)
Study population: Mothers with a birth in the 5 years preceding the survey (pregnancy of the most recent birth)
Period of data collection: October-December 2009
Representativity: National

Table A.16: Vitamin A and iron supplementation of women of childbearing age

Survey name/date (Reference)	Background characteristics	Vitamin A supplementation			Iron supplementation		
		Age (years)	Number of mothers	Percentage of mothers who received vit. A supplements within 2 months postpartum	Age (years)	Number of mothers with a birth in the 5 years preceding the survey ¹	Percentage who took iron tablets/syrups during pregnancy
Jordan Population and Family Health Survey [JPFHS] 2009 (Oct. – Dec. 2009) (DoS and ICF Macro, 2010)	Total	–	n.a.	n.a.	15-49	6646	80.5
	Residence						
	urban	–	n.a.	n.a.	15-49	5417	82.0
	rural	–	n.a.	n.a.	15-49	1029	72.7
	Region						
	North	–	n.a.	n.a.	15-49	1894	72.2
	Central	–	n.a.	n.a.	15-49	3987	84.9
	South	–	n.a.	n.a.	15-49	564	77.1
	Governorates						
	Amman	–	n.a.	n.a.	15-49	2469	86.1
	Balqa	–	n.a.	n.a.	15-49	396	87.2
	Zarqa	–	n.a.	n.a.	15-49	966	81.4
	Madaba	–	n.a.	n.a.	15-49	157	81.2
	Irbid	–	n.a.	n.a.	15-49	1261	75.0
	Mafrq	–	n.a.	n.a.	15-49	298	60.7
	Jarash	–	n.a.	n.a.	15-49	185	73.1
	Ajloun	–	n.a.	n.a.	15-49	150	70.2
	Karak	–	n.a.	n.a.	15-49	229	77.6
	Tafiela	–	n.a.	n.a.	15-49	(88)	(74)
	Maán	–	n.a.	n.a.	15-49	107	71.0
Aqaba	–	n.a.	n.a.	15-49	140	82.6	

¹ For women with two or more births during that period, data refer to the most recent birth.

Data into brackets are based on small sample size and therefore must be interpreted with caution.

n.a.: not available

Name of the survey: Jordan Population and Family Health Survey 2007 (DoS and Macro Int. Inc, 2008)

Study population: Mothers with a birth in the 5 years preceding the survey (pregnancy of the most recent birth)

Period of data collection: June-November 2007

Representativity: National

Table A.16: Vitamin A and iron supplementation of women of childbearing age (cont'd)

Survey name/date (Reference)	Background characteristics	Vitamin A supplementation			Iron supplementation		
		Age (years)	Number of mothers	Percentage of mothers who received vit. A supplements within 2 months postpartum	Age (years)	Number of mothers with a birth in the 5 years preceding the survey ¹	Percentage who took iron tablets/syrups during pregnancy
Jordan Population and Family Health Survey [JPFHS] 2007 (June-Nov. 2007) (DoS and Macro Int. Inc, 2008)	Total	—	n.a.	n.a.	15-49	6446	78.7
	Residence						
	urban	—	n.a.	n.a.	15-49	5417	80.2
	rural	—	n.a.	n.a.	15-49	1029	71.0
	Region						
	North	—	n.a.	n.a.	15-49	1894	71.2
	Central	—	n.a.	n.a.	15-49	3987	82.8
	South	—	n.a.	n.a.	15-49	564	75.3
	Governorates						
	Amman	—	n.a.	n.a.	15-49	2469	83.6
	Balqa	—	n.a.	n.a.	15-49	396	86.4
	Zarqa	—	n.a.	n.a.	15-49	966	80.3
	Madaba	—	n.a.	n.a.	15-49	157	76.5
	Irbid	—	n.a.	n.a.	15-49	1261	73.9
	Ma'raq	—	n.a.	n.a.	15-49	298	60.2
	Jarash	—	n.a.	n.a.	15-49	185	72.4
	Ajloun	—	n.a.	n.a.	15-49	150	69.2
	Karak	—	n.a.	n.a.	15-49	229	74.9
	Tafiela	—	n.a.	n.a.	15-49	[88]	[73]
	Maán	—	n.a.	n.a.	15-49	107	69.4
Aqaba	—	n.a.	n.a.	15-49	140	81.8	

¹ For women with two or more births during that period, data refer to the most recent birth

n.a.: not available

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