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Micronutrient Status of Women and Young Children in the Hashemite Kingdom of Jordan

September 27, 2022

Eng. Rawhieh Barham | Dr. Asma Basha | Dr. Narmeen Al-Awwad

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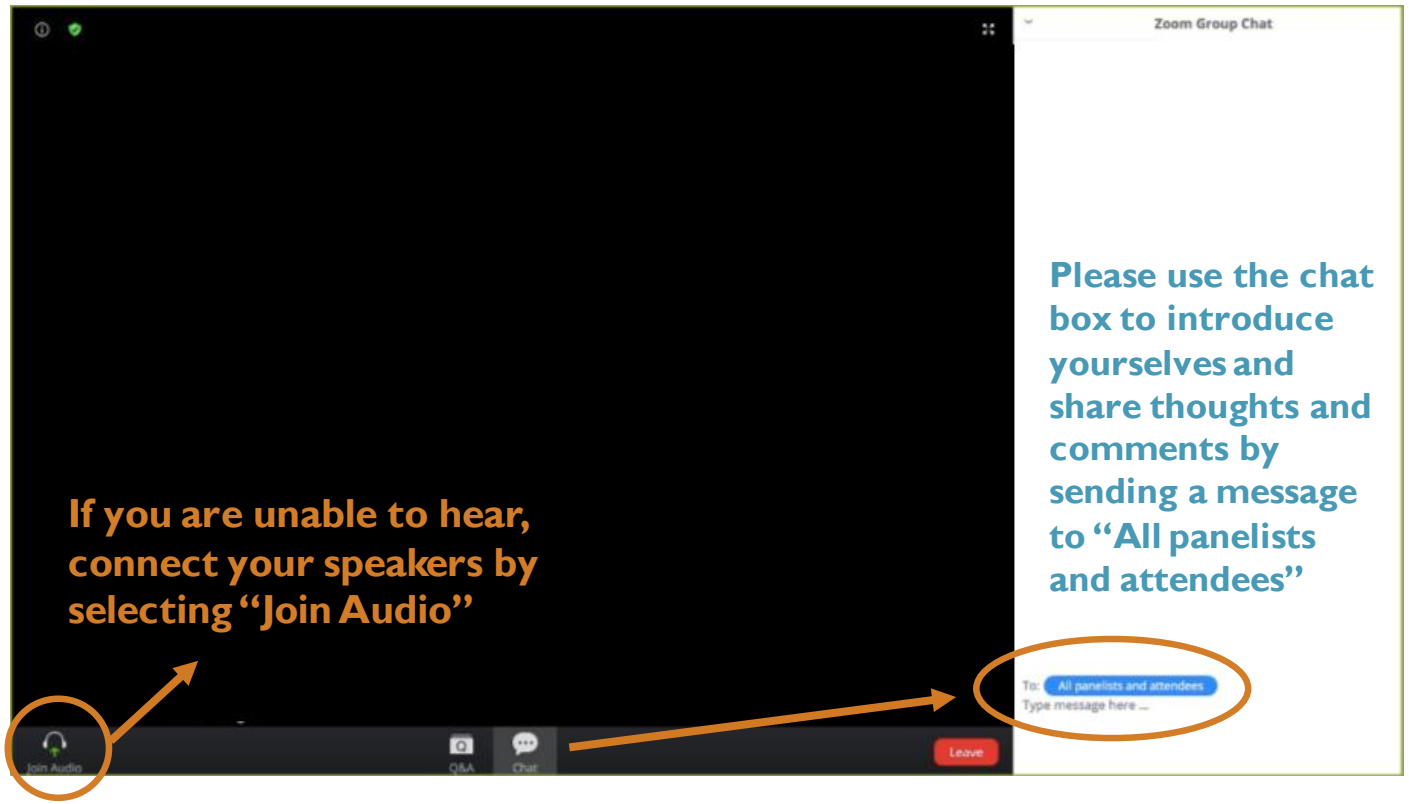

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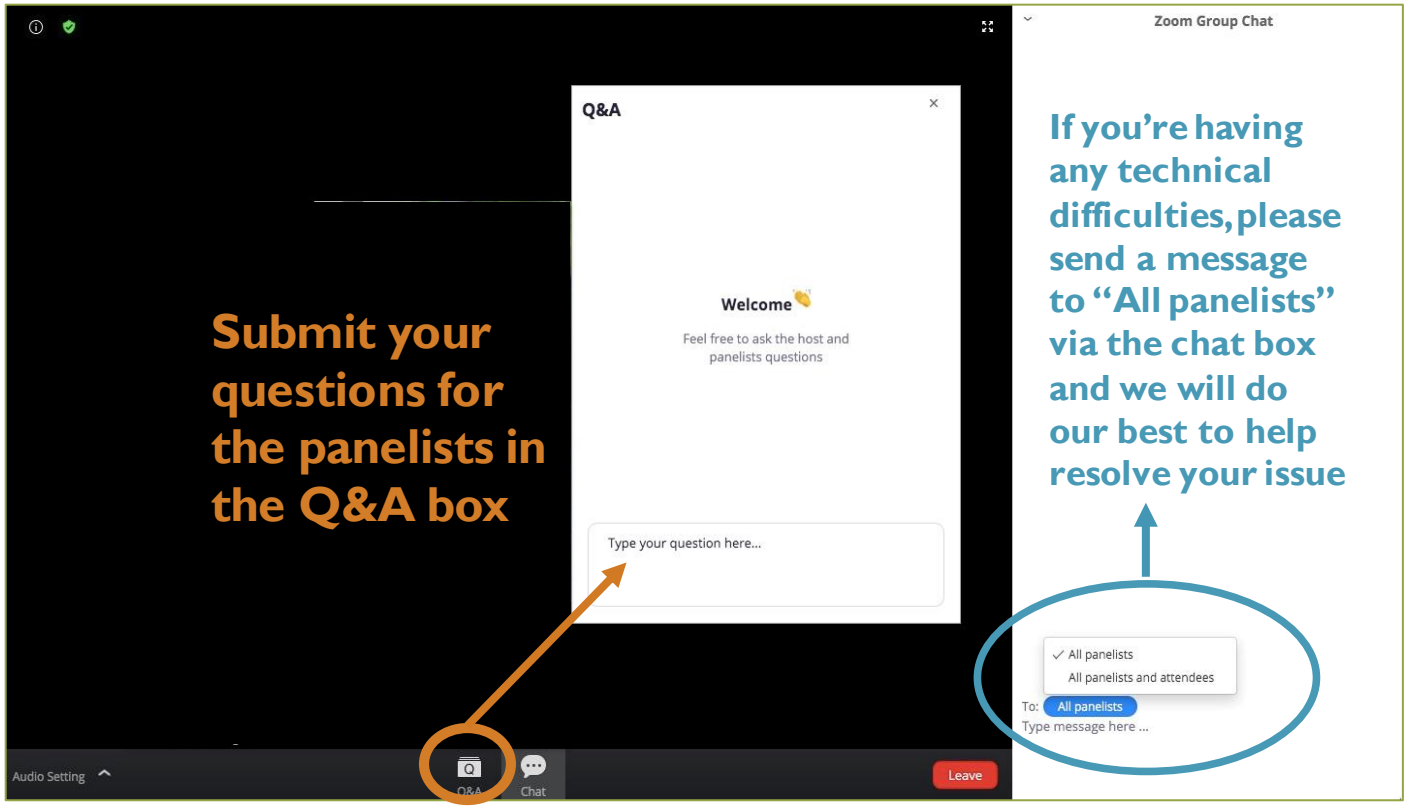
Q&A AND CHAT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Jordan Nutrition Innovation Lab Webinar

Micronutrient Status of Women and Young Children in the Hashemite Kingdom of Jordan

Tuesday, September 27, 2022
2:00-3:30 pm Jordan Time | 7:00-8:30 am US Eastern

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Jordan Ministry of Health

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The Hashemite University

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Impact of Nutritional strategies On Improving Nutrition Status Of Children Under Five Years and Women In Child Bearing Age in Jordan (NJMNS2010-2019)

Eng. Rawhieh Barham
Nutrition Department
Ministry of Health

27/9/2022

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وزارة الصحة
المملكة الأردنية الهاشمية

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PROGRAMS TO COMBAT MALNUTRITION IN JORDAN

- Because of high goiter rates observed in the 1990's, the Jordan government has initiated a salt iodization program, rendering the iodization of salt for human consumption mandatory; shortly thereafter, Jordan joined the Iodine Deficiency Disorders Control Program.
- This led to the establishment of a monitoring and evaluation program in 2000, succeeding in implementing an effective iodization program including coverage of legislation, political buy-in, public education, and monitoring.
- Surveys conducted in 2002 and 2010 found a consistent improvement of iodine nutrition in school-age children.
- This was followed by an adjustment of mandated iodine levels down from 50 ppm to 20-40 ppm.

FLOUR FORTIFICATION PROGRAM

- To tackle the burden of additional micronutrient deficiencies, the Ministry of Health initiated a flour fortification program in 2002, rendering the addition of iron and folic acid to the Mowahad wheat flour mandatory .
- Later on, in 2006, the program was expanded by adding vitamins A, B1, B2, B3, B6 and B12 as well as zinc to the premix.
- An impact assessment comparing the 2010 with the 2002 national micronutrient survey results found mixed results, with declines in the prevalence of iron deficiency and iron deficiency anemia in children but not women.
- However, based on the results from the 2010 survey(which showed a very high prevalence of vitamin D deficiency, vitamin D was additionally included in the wheat flour premix.

VITAMIN A SUPPLEMENTATION

- To address the sequelae of vitamin A deficiency in children, vitamin A supplementation (100,000 IU) is recommended for infants along with the measles vaccine, in 2005.

- Based on the result of 2010 national micronutrient survey which reveled that vitamin A deficiency is a public health problem of moderate importance in children, a routine vitamin A supplementation (200,000 IU) recommended for children 18 months of age in 2012 .

OBJECTIVES

- To assess trends for key micronutrient indicators for preschool children and women in child bearing age in 2010 compared with 2019.
- Estimate the prevalence of acute malnutrition (wasting) using weight-for-height, chronic malnutrition (stunting) using height-for-age, underweight using weight-for-age, and overweight and obesity using body mass index (BMI) for age in pre-school children .
- Estimate the prevalence of chronic energy deficiency, and overweight and obesity in non-pregnant women by calculating the BMI.
- Provide an updated estimate of the coverage of (adequately) fortified bread in households in Jordan.

Ensuring comparability of 2019 & 2010 surveys

- Only data from the settled population from the JNMNS 2019 was used;
- The age range for pre-school children was restricted to 12-59 months because no children younger than 12 months were included in the 2010 survey;
- No adjustment for inflammation was done for ferritin or RBP values because this was not done in 2010;
- Red blood cell folate, not serum folate, was used for the folate deficiency comparison;
- To define fortified bread in the 2019 survey, a cutoff of 15 ppm was used to replicate as closely as possible the iron spot test used in the 2010 survey; this threshold was determined to yield decent sensitivity compared to quantitative measurements.

Comparison of key results between 2010 and 2019 for the settled population, Jordan

Indicator[a]	2010		2019		p-value
	N	% (95%CI)	N	% (95%CI)	
Households					
Fortified bread ≥ 15 ppm[a]	1737	44.1% (40.2, 48.0)	353	83.8% (77.6, 88.6)	<0.001
Fortified Komaji bread ≥ 15 ppm[a]	1274	50.5% (46.2, 54.9)	266	83.3% (76.0, 88.7)	<0.001

Comparison of key results between 2010 and 2019 for the settled population, Jordan

Preschool children 12-59 months

Indicator[a]	2010		2019		p-value
	N	% (95%CI)	N	% (95%CI)	
Anemia	919	16.8% (14.2, 19.8)	367	10.6% (7.3, 15.1)	<0.05
Iron deficiency[b]	964	13.7% (11.2, 16.7)	355	20.4% (16.0, 25.7)	<0.05
Iron deficiency anemia[b]	919	4.8% (3.6, 6.5)	350	4.5% (2.6, 7.8)	0.836
Vitamin A deficiency (retinol)[b]	933	18.2% (15.3, 21.4)	300	7.4% (4.4, 12.0)	<0.001
Vitamin D deficiency	933	17.3% (14.4, 20.7)	309	22.9% (17.5, 29.3)	0.089
Underweight (WAZ < -2)	1022	2.6% (1.7, 4.0)	587	1.4% (0.6, 3.3)	0.217
Stunting (HAZ < -2)	1013	11.7% (9.3, 14.5)	575	6.3% (3.7, 10.4)	<0.05
Wasting (WHZ (< -2)	1030	3.5% (2.2, 5.7)	574	0.1% (0.0, 0.4)	<0.001
Overweight (WHZ> +2, ≤ +3)	1017	6.4% (4.4, 9.2)	574	6.2% (4.0, 9.6)	0.931[e]
Obesity (WHZ > +3)	1017	1.8% (1.1, 3.0)	574	2.1% (1.1, 4.1)	

Comparison of key results between 2010 and 2019 for the settled population, Jordan

Non-pregnant women 15-49 years

Indicator[a]	2010		2019		p-value
	N	% (95%CI)	N	% (95%CI)	
Anemia	1990	30.6% (28.0, 33.2)	669	25.1% (21.1, 29.6)	<0.05
Iron deficiency[b]	1994	35.0% (32.1, 38.1)	666	50.4% (44.5, 56.3)	<0.001
Iron deficiency anemia[b]	1986	20.0% (18.0, 22.1)	670	20.7% (17.4, 24.5)	0.738
Vitamin A deficiency[c]	1991	4.8% (3.8, 6.0)	667	2.9% (1.6, 5.1)	0.092
Vitamin D deficiency	1991	60.6% (57.4, 63.3)	653	63.6% (57.5, 69.3)	0.408
Folate deficiency (RBC folate)[d]	382	13.4% (10.0, 17.7)	127	33.1% (23.0, 45.1)	<0.001
B12 deficiency	1998	11.3% (9.5, 13.3)	647	18.8% (15.2, 23.0)	<0.001

Summary of key findings of the JNMNS, including assessment of temporal trends[1] and of public health relevance

Indicator	Settled population Jordan		
	HH	PSC	NPW
Fortified bread (≥ 15 ppm)	84% ↗ [a]		
Anemia[b]		12% ↘	24% ↘
Iron deficiency		26% ↗	66% ↗
IDA		5% →	22% →
Vit. A deficiency[c]		8% ↘	3% →
Vit. D deficiency		28% →	64% →
Zinc deficiency[d]		12%	
Folate deficiency			11% ↗
Vit. B12 deficiency			19% ↗
Stunting[e]		7% ↘	
Wasting/underweight[e]		<1% ↘	5%
Overweight/obesity[e]		9% →	60%
Obesity		2% →	30%

Level of public health problem[b-e]:	Normal	Mild	Moderate	Severe

[b] Public health categorization according to WHO[31]: <5% normal, 5-19.9% mild, 20-39.9% moderate, ≥40% severe.
[c] Public health categorization according to WHO (developed for children)[33]: <2% normal, 2-9.9% mild, 10-19.9% moderate, ≥20% severe.
[d] Categorization as per iZiNCG: <5% normal, 5-19.9% mild, 20-34.9% moderate, 35-49.9% moderate to severe, ≥50% severe.
[e] Categorization according to de Onis et al. [24] for children less than 5 years and according to WHO for adult women[66].

Conclusion

- ✓ With regard to anemia, there has been a decrease in prevalence in the Jordanian population in the past decade. since the 2010 National Micronutrient Survey.
- ✓ The prevalence of anemia in children 12-59 months decreased by 6 percentage points; however, the prevalence of iron deficiency increased by about 7 percentage points. The prevalence of iron deficiency anemia remained largely unchanged.
- ✓ The prevalence of vitamin A deficiency decreased, but the prevalence of vitamin D deficiency increased, albeit without statistical significance.
- ✓ The prevalence of stunting and wasting in children decreased over this time period, while the prevalence of child underweight, overweight and obesity remained largely unchanged.

The change in vitamin A deficiency in pre-school children from 2010 to 2019 may be attributable to the implementation of Jordan's vitamin A supplementation program and changes is dietary patterns over the past decade.

- ✓ Non-pregnant women 15-49 years of age show a decline in the prevalence of anemia, an increase in the prevalence of iron deficiency, and little change in the prevalence of iron deficiency anemia between 2010 and 2019.
- ✓ The prevalence of deficiencies vitamins A and D remained largely the same.
- ✓ On the other hand, the prevalence of both folate and vitamin B12 deficiency increased substantially during this time period.
- ✓ No anthropometric measurements on non-pregnant women were conducted in 2010 and thus, no comparison could be done.

The decline in anemia prevalence since 2010 may be attributable to some extent to Jordan's wheat flour fortification program, and further research is needed to investigate the impact of Jordan's fortification program and the etiology of anemia in Jordan

Household-level findings

- The JNMNS found a higher coverage of bread made with fortified flour than the 2010 survey, when using a cutoff of 15 ppm of iron.
- The Median daily bread intake for children 12-59 months was 120 gm per day and the Median proportion of iron intake from bread = 68.
- Bread intake accounts for ~20% of recommended nutrient intake in non-pregnant women.

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CAUSES AND CONSEQUENCES OF IRON DEFICIENCY ANEMIA AMONG PREGNANT LADIES

ANEMIA and PREGNANCY

Prof Asma Basha /Jordan University

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WHY

To meet the new demands of a normal term pregnancy (1000 mg):

- 300 - 400 mg fetus and placenta
- 500 - 600 mg maternal red cell increase
- 200 - 300 mg compensate for normal daily losses

- Translates into required daily absorption of 3.5 mg. About 10% of the ingested iron is absorbed in non pregnant state which will increase up to 40% during pregnancy

****The expected blood loss after delivery.

****Lactation!!

DEFINITION

Hb level below:

- Less than 11 g/dl up to 12 weeks' gestation.
- Less than 10-10.5 g/dl at 28 weeks.

MATERNAL PHYSIOLOGY

- Circulating red cell mass increases by (20–30%), both cell number and size (more with multiple pregnancies).
- Serum iron concentration falls.
- Absorption of iron from the gut rises.
- Iron-binding capacity rises.
- Increased synthesis of the *β1-globulin and transferrin.*
- Increase reticulocytes count.

PHYSIOLOGIC ANEMIA OF PREGNANCY.

- Plasma volume increases up to 50%.
- Red cell mass increases by 20-30%.

  (leads to physiological hemodilution with a decreased Hb concentration with no change in mean corpuscular volume (MCV) or mean corpuscular hemoglobin concentration (MCHC).
- Physiologic anemia of pregnancy nadiring at 30 weeks
- Iron stores are diminished in 40% of women with multiple gestation, so that routine hematinic supplementation is recommended, particularly given the increased risk of PPH and CS.

PATHOLOGICAL ANEMIA IN PREGNANCY

- Iron Deficiency.
- B12 level Deficiency.
- Folic acid level Deficiency.
- Hemoglobinopathy.
- Medical diseases (hemolytic anemia).
- Chronic illnesses (autoimmune conditions as SLE, infections and malignancy).
- Combination.

Iron deficiency remains the commonest and iron deficiency anemia is the commonest hematological problem in pregnancy.

CAUSES OF IRON DEFICIENCY

- Diet : Vegetarian
  Improper diet
  Inability to have nutritious diet
- Malabsorption: Coeliac disease
  Gastrectomy
- Blood loss: Menorrhagia
  Peptic ulceration
  Inflammatory bowel disease
  Hemorrhoids
  Varices
  Aspirin
  Anticoagulants
  Von Willebrands disease

OTHER CAUSES OF IRON DEFICIENCY IN PREGNANCY

Depleted iron stores

Previous recent pregnancies; less than a year.

Breastfeeding.

Common in multiple pregnancy.

Blood loss at the time of delivery. (blood loss 500 mL- 800 mL).

SYMPTOMS OF ANEMIA

- The signs and symptoms of early deficiencies are nonspecific:

  Tiredness, Headache.

  Faintness, Dyspnoea.

  Palpitation, Chest pain. Angina.

  Lethargy, Dizziness. Weakness.

  Features of any underlying cause.

- If begins pregnancy anemic, she becomes rapidly symptomatic.
- Most cases present in the third trimester since this is when demands for iron reach their peak.

PHYSICAL EXAMINATION

During examination one relies heavily on observational skills:

Pallor.
Brittle nails and Koilonychia (spoon-shaped nails)
Angular stomatitis.
Brittle hair.
Atrophy of tongue papillae
Tachycardia, murmur and signs of Heart failure
Signs of underlying disease.

THE SCREENING AND TESTS FOR ANEMIA

- Hb /PCV.
- Blood indices.(MCV, MCH, MCHC).
- Blood film.
- Ferritin.
- B12 level.
- Folic acid level .
- Hb-electrophoresis.
- Investigation for chronic medical illnesses.

Anemia in pregnancy is usually diagnosed on routine testing

Routine screening should be performed at the booking visit and at 28 weeks gestation

EFFECTS OF IRON DEFICIENCY ON PREGNANCY AND OFFSPRING

- Affects iron-dependent enzymes in each cell.
- Profound effects on muscle and neurotransmitter activity.
- Associated with:
  - LBW.
  - PT delivery.
  - Maternal infection
  - Increased blood loss at delivery.
  - Poor fetal iron stores
  - Increased placenta: fetus weight ratio.
  - Severe IDA is associated with increased maternal and perinatal mortality

MANAGEMENT

Prophylaxis is prevention:

- The increased iron demand during pregnancy cannot be met by increased absorption alone, and a high proportion of women in their reproductive years lack storage iron; routine supplementation with oral iron is advised.

- Supplementation :30–60 mg of iron/day (30% troublesome side effects : take alternate day, twice-weekly or weekly supplements rather than to discontinue them).

- Absorption is maximized with ascorbic acid, fresh orange juice or a vitamin C preparation.

- Inhibitors to absorption include phytic acid and tannins present in tea, coffee and chocolate.

PROPHYLAXIS IS PREVENTION:

WHO and the International Nutritional Anemia Consultative Group and the United Nations Children's Fund:

Issued guidelines recommending routine supplements "60 mg/day iron and 400 µg/ day folic acid" to all pregnant women for at least 6 months until 3 months post-partum in areas with a high prevalence of anemia.

WHAT HAPPENED

- Without Iron Supplement
  - Hemoglobin falls
  - Serum iron falls
  - Ferritin falls
  - TIBC increases
- With Iron Supplementation
  - Hemoglobin is unchanged
  - Serum iron is unchanged
  - Ferritin is unchanged
  - TIBC increases, but by a smaller degree.

GRADES OF ANEMIA

- Mild degree : 10-10.9 gm/dl.
- Moderate degree : 7-10 gm/dl.
- Severe degree : less than 7 gm/dl.
- Very severe degree : less than 4 gm/dl

TREATMENT

- The treatment ID is 200 mg/day of elemental iron {tablets or capsules}, if GI upset; dose reduction (100 mg/day), or a change in the preparation is advised.
- More than 200 mg/day will not produce a supra-normal (Hb) or (HCT).
- There are also liquid oral iron preparations.
- Iron deficiency diagnosed late in pregnancy may necessitate blood transfusion as the maximum rise in Hb achievable with either oral or parenteral iron is 0.8 g/dL/week.

TREATMENT

Therapy failure

- Mal absorption.
- When loss exceeds intake.
- Most commonly due to poor compliance.

***If so, parenteral therapy is useful, however, it does not produce a faster response than oral iron (safe throughout pregnancy).

TO REMEMBER

- Pregnancy causes 2-3 folds increase in the requirement for iron.
- Iron deficiency remains the commonest.
- Many women develop iron deficiency anemia because they enter pregnancy with depleted iron stores.
- Anemia in pregnancy is usually diagnosed on routine testing.
- Routine screening should be performed at the booking visit and at 28 weeks gestation.
- The best approach is prevention with oral iron supplements, at least in those at high risk of becoming anemic.
- The maximum rise in Hb achievable with either oral or parenteral iron is 0.8 g/dL/wk.
- Routine iron supplementation is recommended in multiple gestation.

Iron deficiency remains the commonest and iron deficiency anemia is the commonest hematological problem in pregnancy.

REFERENCES

- Handbook of Obstetric Medicine Sixth Edition.
- Dewhurst's Textbook of Obstetrics & Gynaecology, Seventh Edition.
- WHO.
- Benson and Pernoll's Handbook of Obstetrics and Gynecology ,10th edition , Martin L. Pernoll and others

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Nutritional Status and Food Consumption Patterns for Children and Women of Reproductive Age in Jordan

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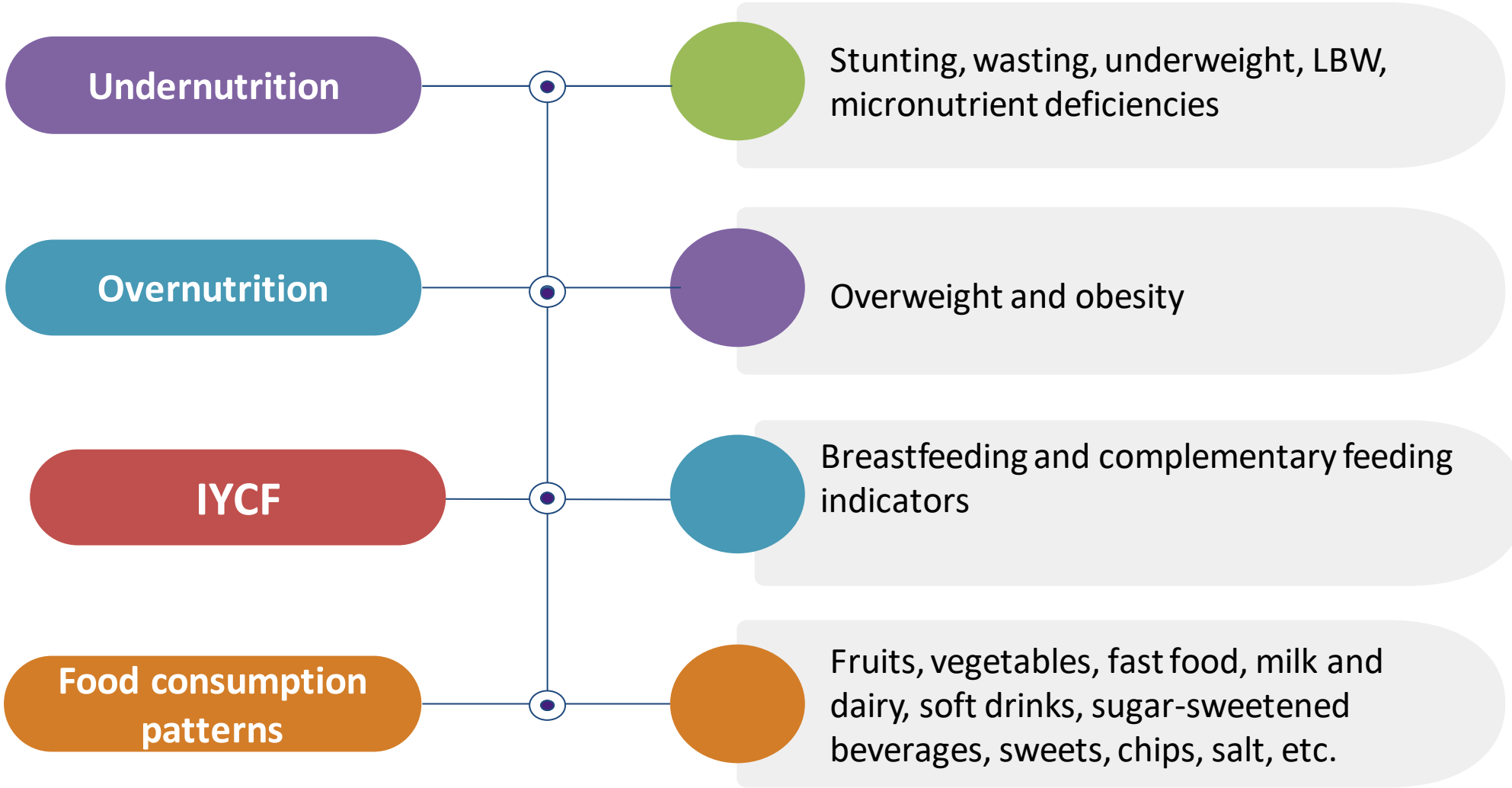
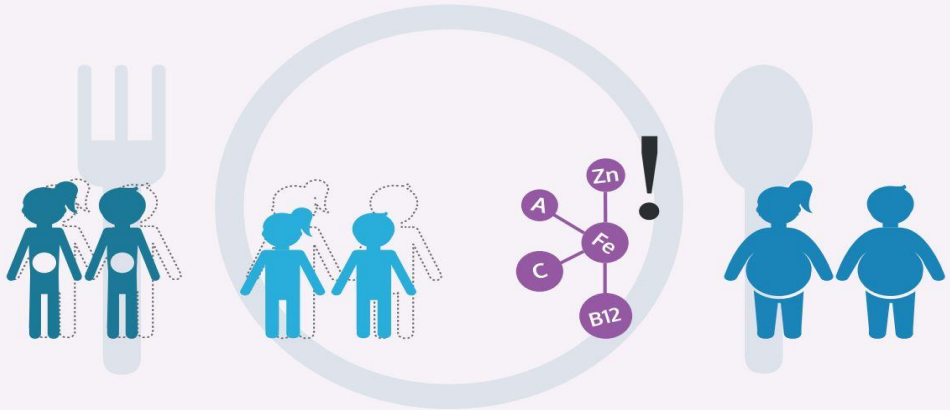
Outline


Undernutrition
Stunting, wasting, underweight, LBW, micronutrient deficiencies
Overnutrition
Overweight and obesity
IYCF
Breastfeeding and complementary feeding indicators
Food consumption patterns
Fruits, vegetables, fast food, milk and dairy, soft drinks, sugar-sweetened beverages, sweets, chips, salt, etc.

Malnutrition represents the #1 risk factor in the global burden of disease. [1]

Double burden of malnutrition [2]
– Global and EMR



Undernutrition (wasting, stunting and micronutrient deficiencies) along with overweight and obesity

WHO-EMR, 2021 [2]

Jordan is witnessing a nutrition transition, shifting towards a more westernized diet. [3]

1. Nasreddine L, Ayoub JJ, Al Jawaldeh A. Review of the nutrition situation in the Eastern Mediterranean Region. Eastern Mediterranean Health Journal. 2018;24(1):77-91.
2. WMO-EMR (2021). Malnutrition in all its forms [webpage]. Accessed on 24 Sept 2021. Available from: http://www.emro.who.int/nutrition/double-burden-of-nutrition/index.html.
3. Nasreddine, Lara M., et al. "Nutritional status and dietary intakes of children amid the nutrition transition: the case of the Eastern Mediterranean Region." Nutrition research 57 (2018): 12-27.

- **The faulty food consumption patterns**

Reflect

- **The ongoing nutrition transition towards a more westernized diet**

Contribute to

- **The escalating burden of obesity**
- **Micronutrient deficiencies**
- **Increase the risk of NCDs.**

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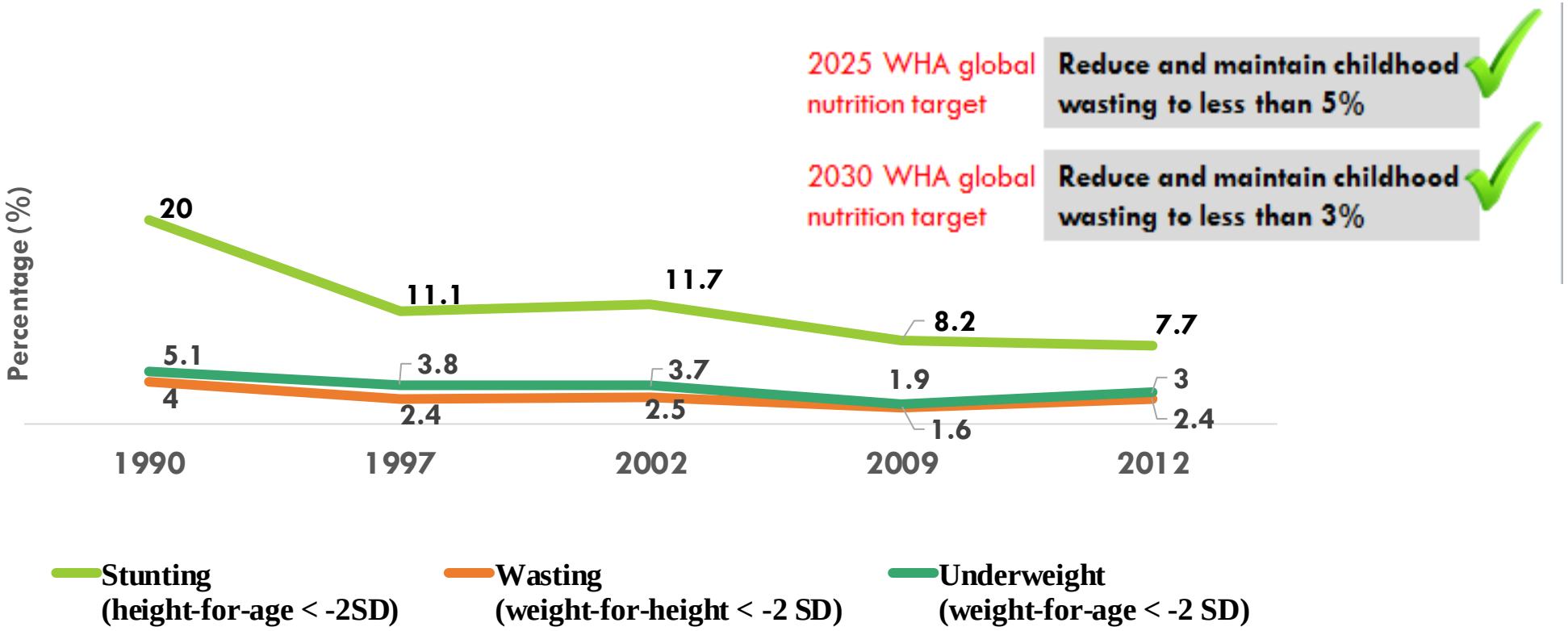
Undernutrition indicators –
Stunting, wasting, and underweight (children under 5 years)



Low burden:

- **Stunting**: ↓ trend
- **Wasting**: fluctuated, overall ↓
- **Underweight**: fluctuated, overall ↓

2025 WHA global nutrition target

Achieve a 40% reduction in the number of children under-5 who are stunted
~~ -3.9% annual rate of change

Source: UNICEF, 2021

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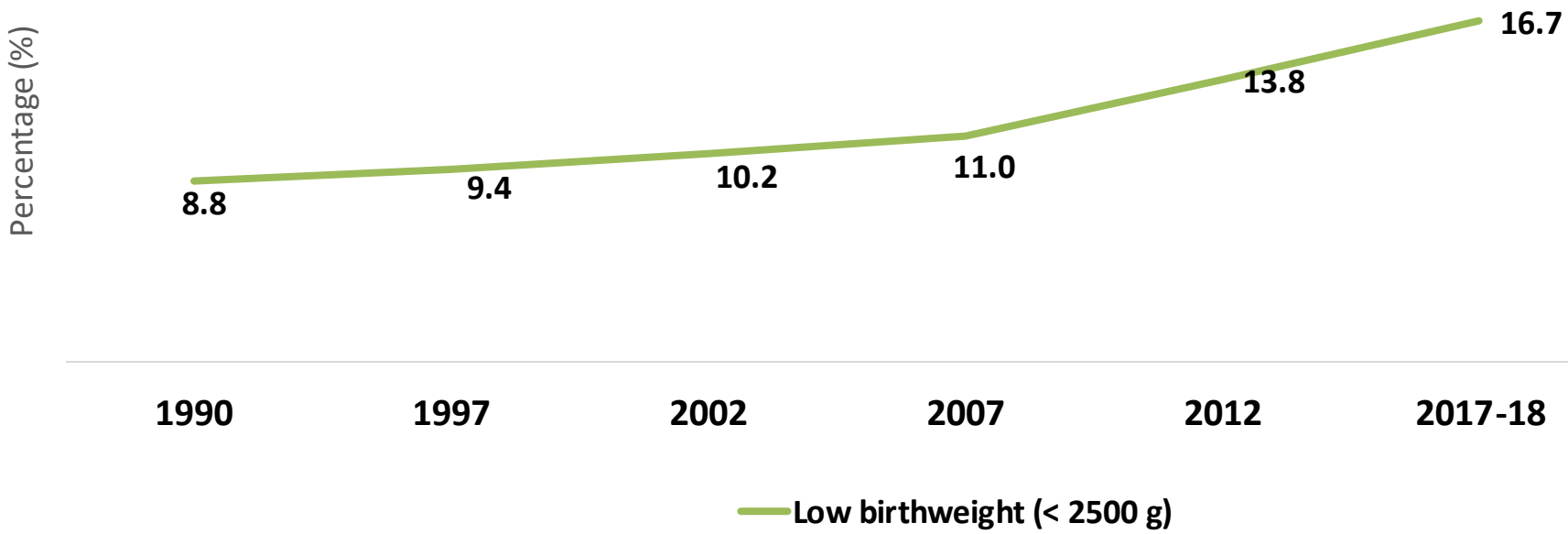
Undernutrition indicators – Low birthweight (< 2500 g)

2025 & 2030 WHA global nutrition target

Achieve a 30% reduction in low birthweight

LBW: ↑ trend



Source: JPFHS 1990, 1997, 2002, 2007, 2012, 2017-18; Islam et al 2020

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Anemia

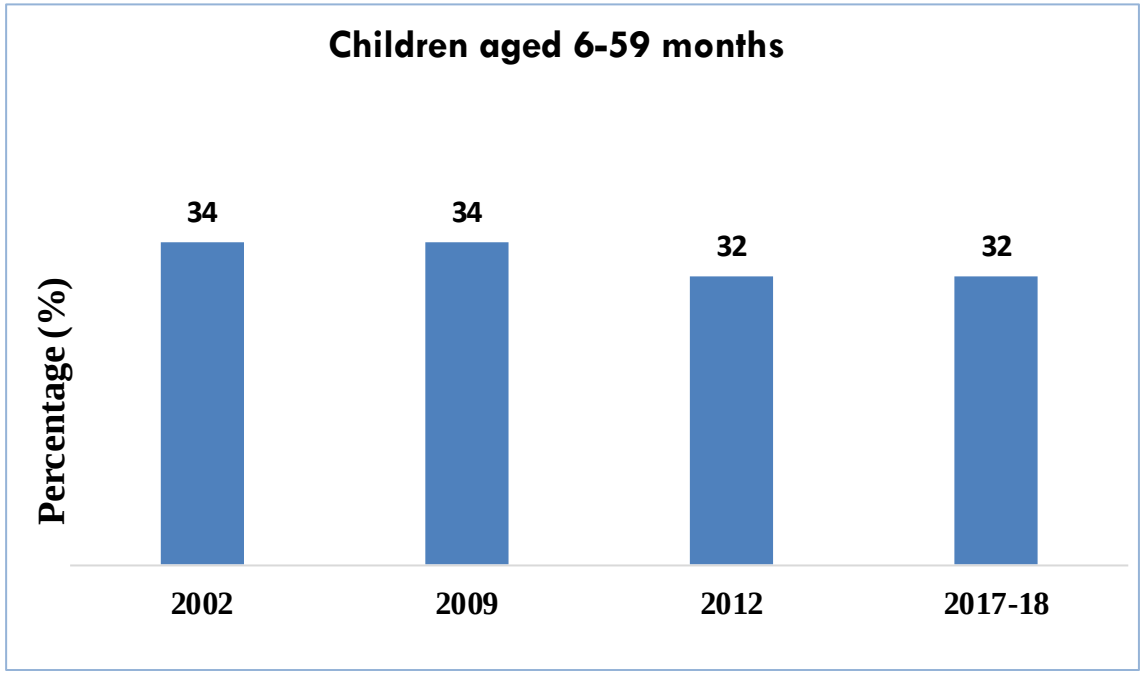
2025 & 2030 WHA global nutrition target

50% Reduction of anemia in women of reproductive age

Children under 5 years

Based on JPFHS surveys (2002-2017/18), findings among 6-59 months old children showed:

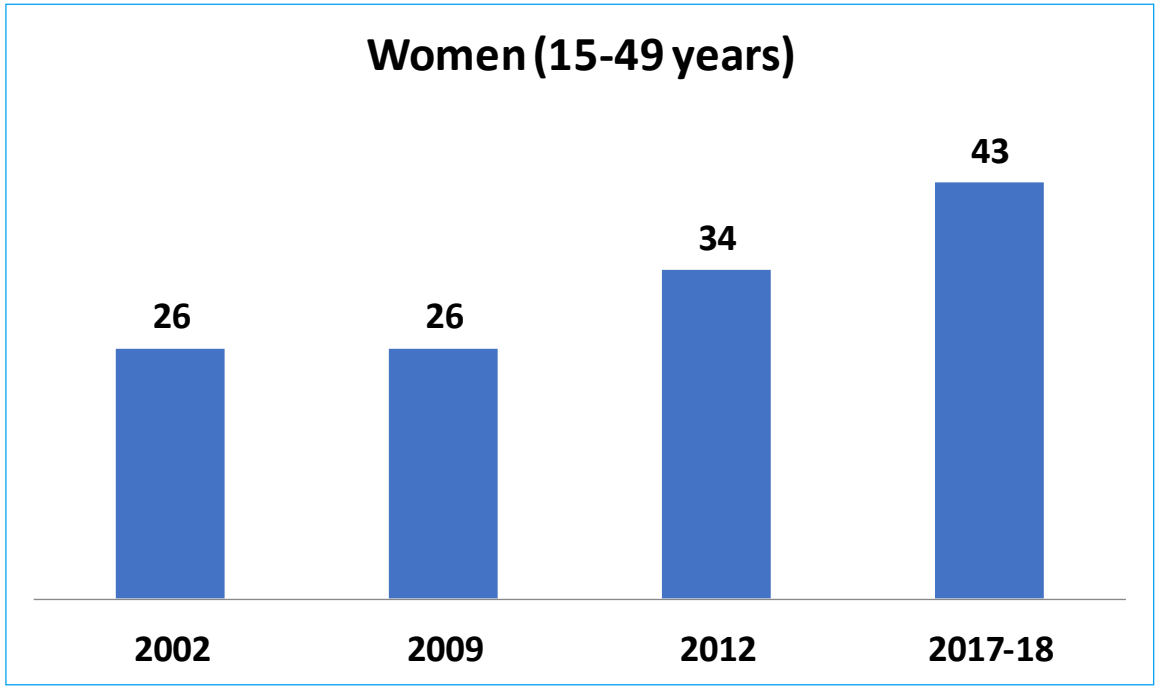
- **Anemia**: stable 2002-2009, then slightly ↓ trend



* Any anemia (<11.0 g/dl)

Women of reproductive age

Based on JPFHS surveys (women 15-49 years): ↑ trend in the prevalence of anemia (26% vs. 43%)



- **Non-pregnant women Hb < 12.0 g/dL**
- **Pregnant women Hb < 11.0 g/dL**

Source: JPFHS 2002, 2009, 2012, 2017-18

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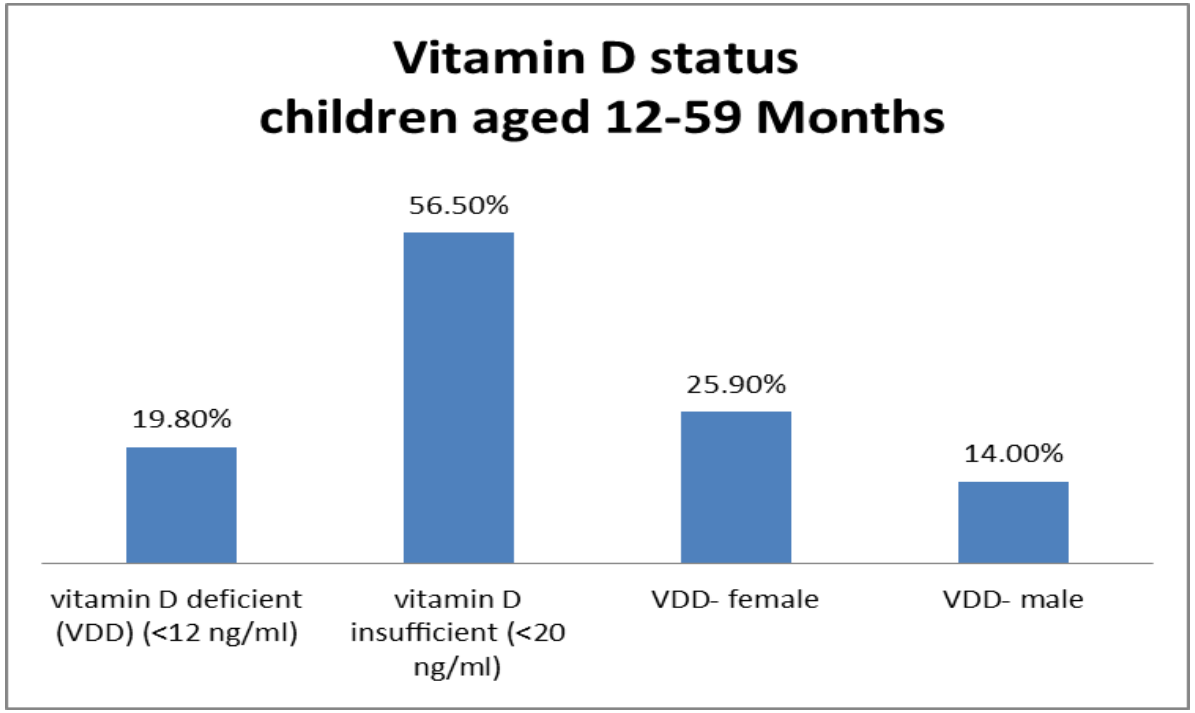
Vitamin D deficiency

National micronutrient survey 2010

1. Vitamin D deficient (VDD) (<12 ng/ml): 19.8%; Vitamin D insufficient (<20 ng/ml): 56.5%
2. VDD was higher among females than males (25.9% and 14%)



Children under 5 years

- Abdul-Razzak *et al*., 2011
  n=275 preschool children (136 infants and 139 toddlers) aged 6–36 months in Irbid (North of Jordan)

Results:
1- VDD= 28%

2- Female, low sun exposure and exclusive breast-feeding were the main determents of vitamin D levels.

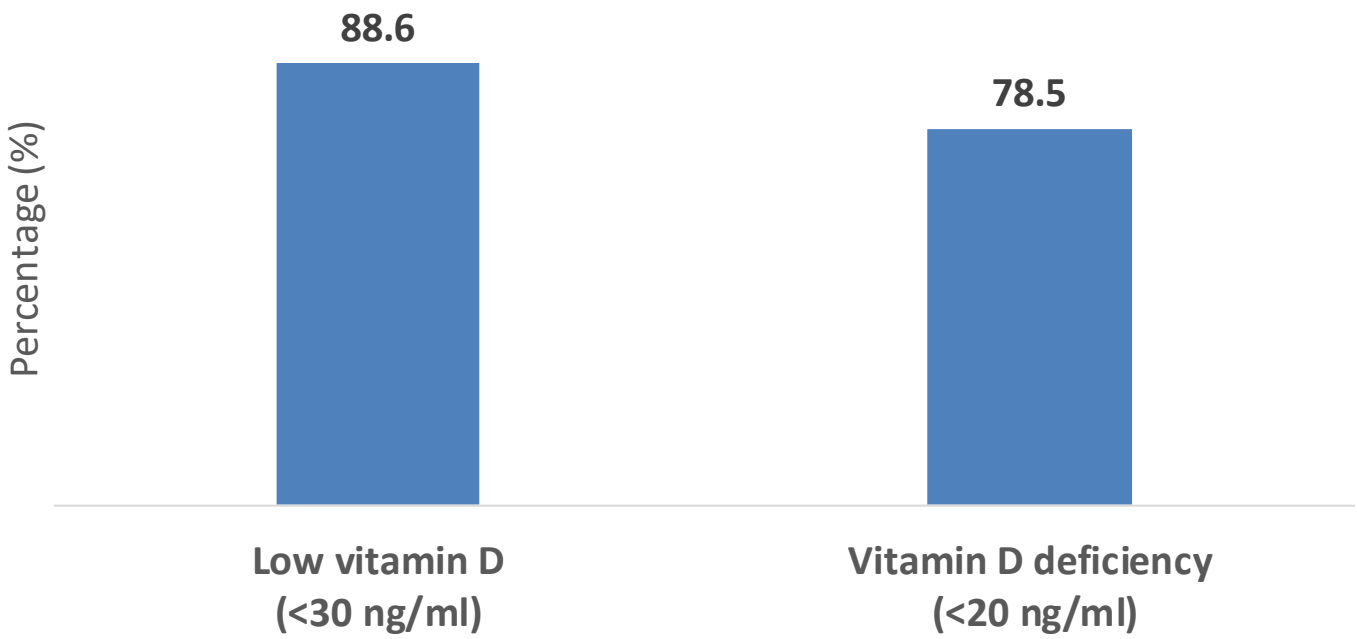
Source: MOH/GAIN/CDC/UNICEF 2011; Abdul-Razzak *et al*., 2011

Vitamin D deficiency

Women of reproductive age

Several studies were found : Very high prevalence

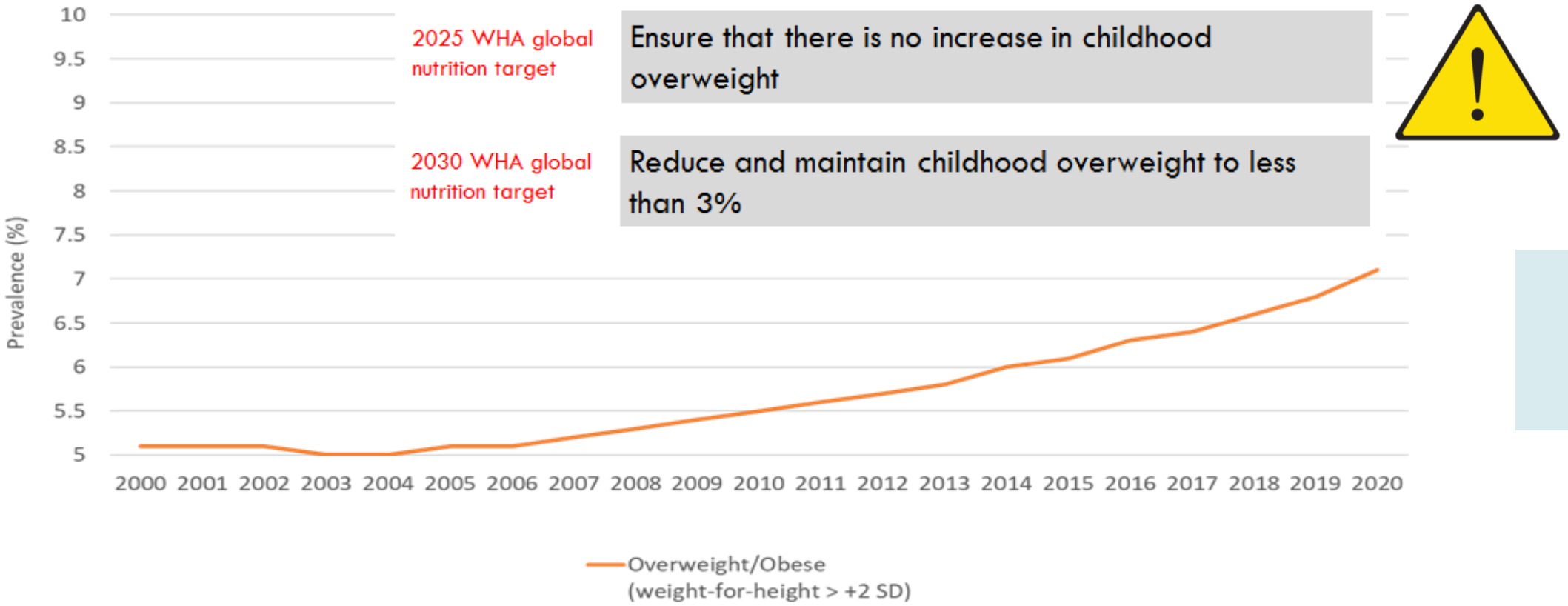
(National representative study, 2017)



Source: El-Khateeb, M., et al., *Vitamin D deficiency and associated factors in Jordan.* SAGE Open Medicine, 2019. **7**: p. 2050312119876151

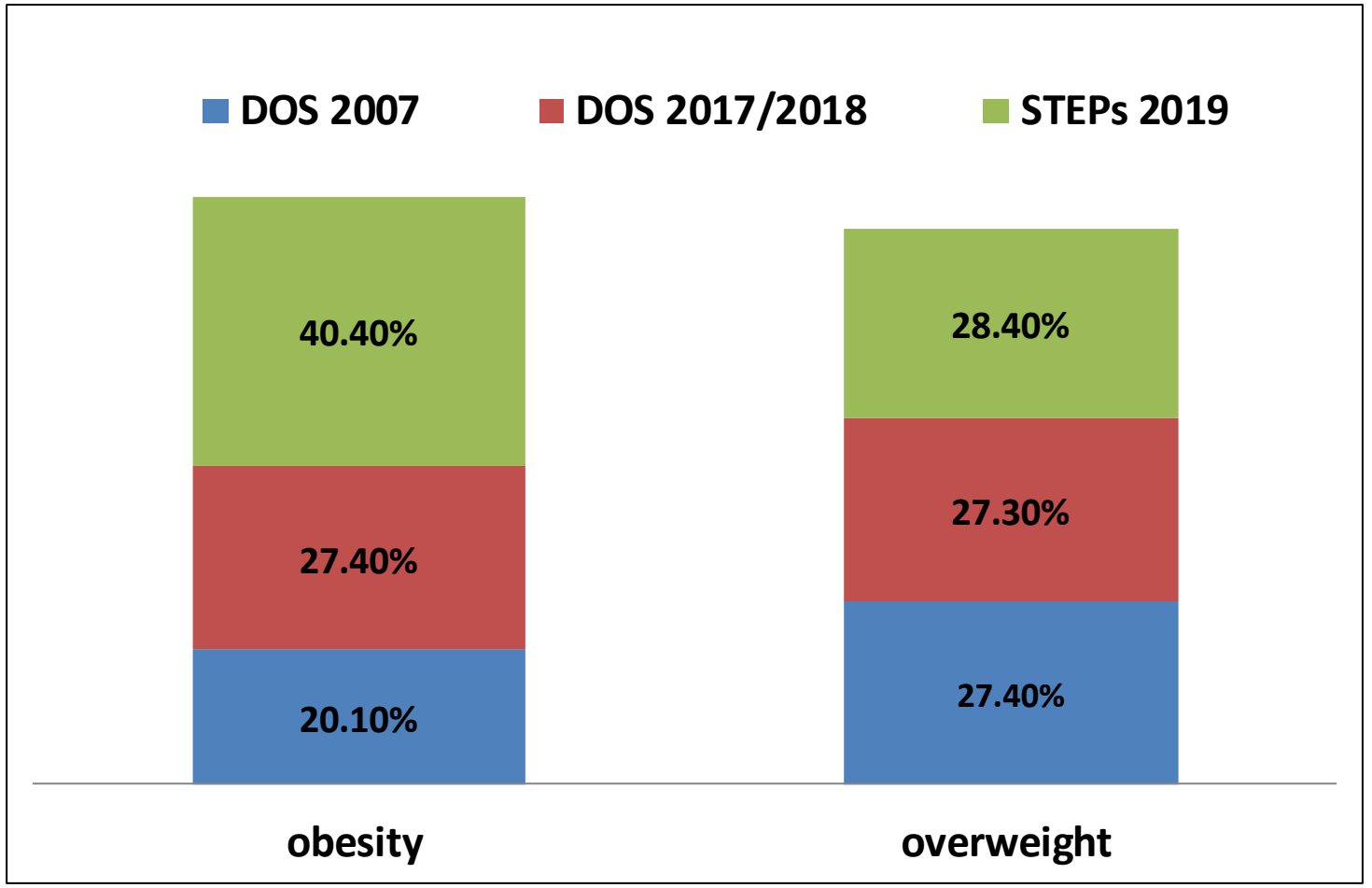
Overweight and obesity

Trends in the prevalence (%) of overweight/obesity among children under 5 years in Jordan, modeled data (2000-2020)



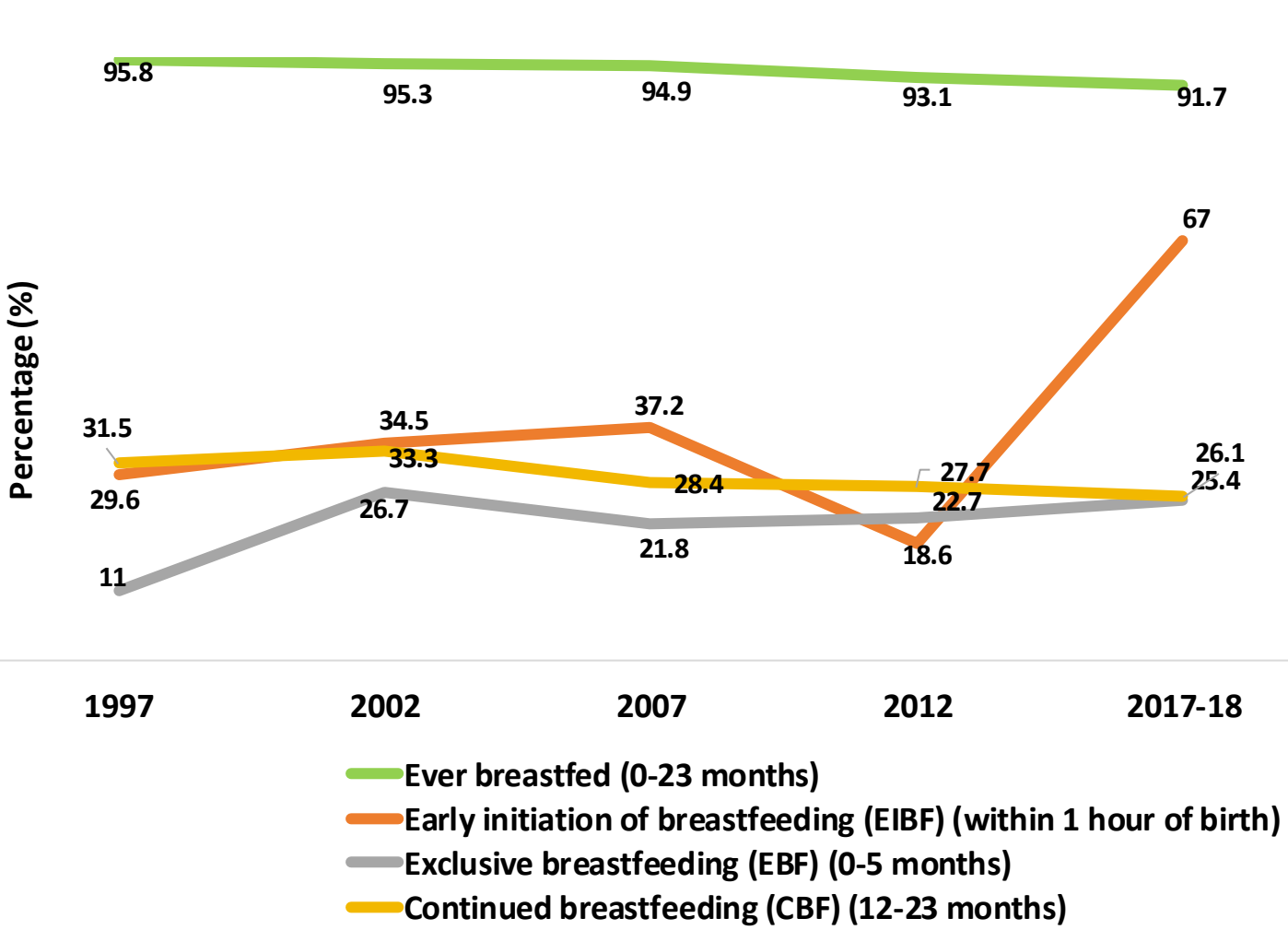
↑ trend:
5.1% (2000)
to
7.1% (2020)

The prevalence of overweight, and obesity among Jordanian women of reproductive age (15-49 years)



Source: *Jordan National Stepwise Survey (STEPs) for Noncommunicable Diseases Risk Factors 2019. The Ministry of Health, Jordan, WHO*. 2020

Infant and Young Child Feeding Practices - Breastfeeding Indicators



- **Ever breastfed**: majority (slight ↓)
- **EIBF**: overall ↑ (by two-fold)
- **EBF (0-6 mo)**: overall ↑, ~stable since 2002, only 26% EBF 0-6 mo
- **CBF (12-23 mo):** overall ↓

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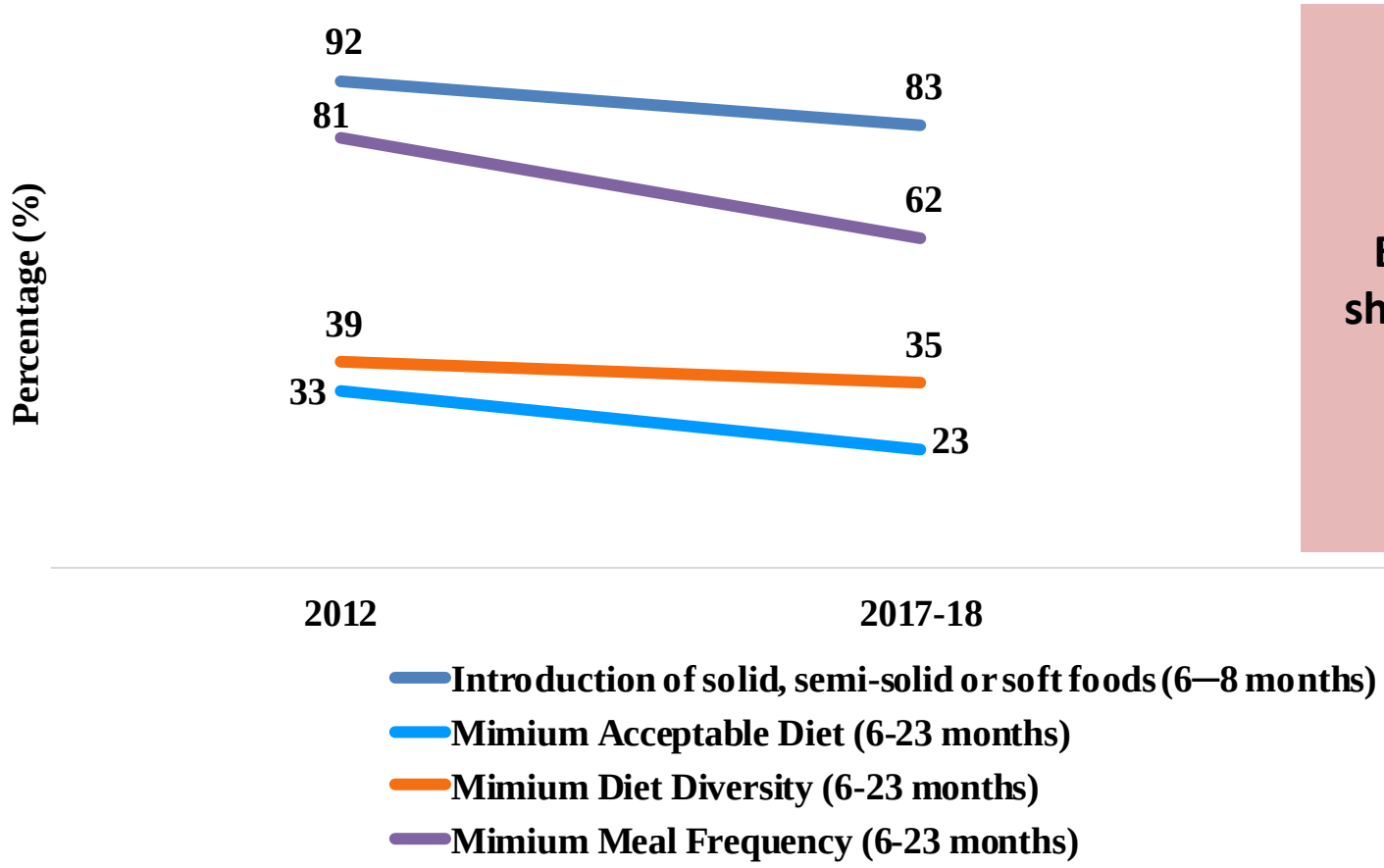
Increase the rate of EBF in the first 6 months up to at least 50%

Sources: UNICEF, 2021; Neves et al, 2021

Infant and Young Child Feeding Practices - Complementary feeding Indicators



Each of those indicators showed a decreasing trend

Source: UNICEF, 2021;

110 International Journal of Child Health and Nutrition, 2017, 6, 110-115

Nutritional Status among Children under Five Years in Amman, Jordan

Mohammad El Azhari[1], Ahmad Abu Slaih[2], Yousef S. Khader[3,*], Abdulhalim Al-Musa[2] and Ibrahim Iblan[1]

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[2]Jordan Ministry of Health/ Amman, Jordan

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Abstract: *Objectives*: There is scarcity of data on malnutrition among children in Jordan. Therefore, this study was conducted to assess the nutritional status and estimate the prevalence rates of stunting, underweight, and wasting and their associated factors among children under five.

El Zhari et al. (2017) conducted a cross-sectional study to assess the nutritional status and estimate the prevalence rates of stunting, underweight, and wasting and their associated factors among children under five (n=923):

- **Low birth weight and mixed feeding** (Exclusively breast feeding and Formula feeding) were associated with **higher rates of stunting and underweight** in children less than five years.

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DOI: 10.1111/mcn.13223

ORIGINAL ARTICLE

Maternal & Child Nutrition WILEY

Predictors of complementary feeding practices among children aged 6–23 months in five countries in the Middle East and North Africa region

Linda Shaker-Berbari[1] | Vilma Qahoush Tyler[1] | Chaza Akik[2] | Zeina Jamaluddine[2,3] | Hala Ghattas[2]

[1]United Nations Children's Fund (UNICEF) Regional Office for Middle East and East Africa Region, Amman, Jordan
[2]Center for Research on Population and Health, Faculty of Health Sciences, American University of Beirut, Beirut, Lebanon

Abstract
Ensuring diets of children aged 6–23 months meet recommended guidance is crucial for growth and development and for the prevention of malnutrition including stunting, wasting and micronutrient deficiencies. Despite some improvement, indicators

- Linda Shaker-Berbari et al.(2020) found that the following factors were associated with minimum dietary diversity (MDD), minimum meal frequency (MMF) and minimum acceptable diet (MAD) at varied levels.

❑ Maternal factors, including maternal education and age,

❑ Household level factors such as paternal education and wealth,

❑ Community-level factors (culture and geographic location),

❑ Utilization of health services.

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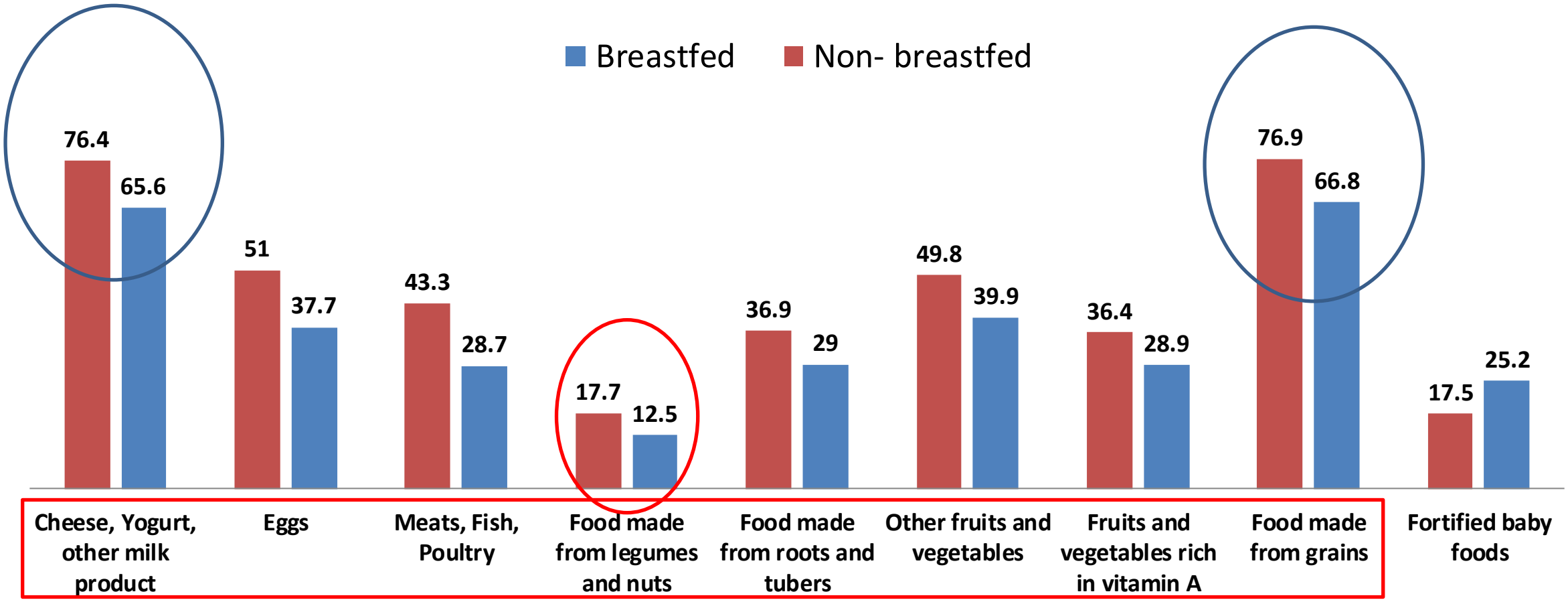
Food Consumption Patterns – Children (6-23 months)



Percentage of 6-23 months age child by type of foods consumed in 2017-18 JPFHS

Food Consumption Patterns –Women of reproductive age

- The food consumption patterns among women of reproductive age were assessed by limited cross-sectional studies.
- Usually included with other studies : male and female, age group : not specific for women of reproductive age.

Study	Fruits	Vegetables	Meat	Milk and Dairy	Bread/ rice/ pasta
El-Qudah, 2008. Amman n= 270 age= 19-70 years. 3- day food Record	0.4 serving/day	1.6 servings/day	1.9 servings/day	1.6 servings/day	5.6 servings/day

Table: Lifestyle practices for women (19-70 years) (El-Qudah, 2008).

Lifestyle practices	Percentage
Eat meals regularly	Irregular: 74.8 %
Eat Breakfast	3-4 times /week: 81.1%
How often do you eat fruits?	daily: 37 %

Proportions of Women of reproductive age reporting consumption of Fruits, Vegetables, and Salt

Study	Age	Fruits	Vegetables	Salt
STEPs- MOH, 2019	18-44 years	Mean intake: 3 days/week 0.9 serving/day	Mean intake: 5.9 days/week 2 servings/day	33.6% add salt when eating. 80.5% add salt when cooking or preparing food
		85.7% <5 servings/day 22.2% 3-4 servings/day 52.8% 1-2 servings/day		

- Women aged 18-44 years consumed 9.7 g of salt per day…. (STEPS MOH, 2019).

Mean intake levels reached double the WHO recommended limitation of less 5 g/day

Food Consumption Patterns –Women of reproductive age

Table: Lifestyle and eating data for Jordan University students, 469 females, aged 17-30 years. (Abu Sbaih et al., 2020)

Variable	n (%)
Number of meals eaten per day	
One meal	31 (6.7)
Two meals	205 (44.2)
≥ three meals	228 (49.1)
Main meal	
Breakfast	77 (16.4)
Lunch	363 (77.4)
Breakfast + Lunch	3 (0.6)
Dinner	26 (5.5)

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nutrients

MDPI

Review

Review of the Nutrition Situation in Jordan: Trends and Way Forward

Narmeen Jamal Al-Awwad [1,†], Jennifer Ayoub [2,†], Rawhieh Barham [3], Wafaa Sarhan [4], Murad Al-Holy [1], Mahmoud Abughoush [1,5], Huda Al-Hourani [1], Amin Olaimat [1] and Ayoub Al-Jawaldeh [6,*]

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CONCLUSIONS

- **The majority of Jordanian infants were not exclusively breastfed, and do not continue breastfeeding for two years.**
- **Most children are introduced to complementary feeding at six months of age. However, a low percentage of those children meet the recommendations regarding the number of food groups, diversity, and timing.**
- **The prevalence of overweight and obesity among women was high and alarming.**
- **National studies assessing food consumption patterns are limited.**
- **The paucity of data may be attributed to limited research funding and lack of coordination between different stakeholders.**

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Thank you

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Q&A

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