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MICRONUTRIENT DEFICIENCIES IN THE PALESTINIAN TERRITORIES:

Identifying the Bottlenecks of Anemia Prevention and Control and Assessing the Feasibility of an Oil Fortification Program

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Identifying the Bottlenecks of Anemia Prevention and Control and Assessing the Feasibility of an Oil Fortification Program

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BACKGROUND

In the Palestinian territories (PT), decades of conflict, economic stagnation, and restricted movement of people and goods, coupled with high unemployment and poverty rates, continue to affect social, health, and nutrition indicators. For decades, several assessments have indicated a poor nutritional status of the population in the West Bank (WB) and Gaza Strip (GS). Specifically, a high prevalence of micronutrient deficiencies still exists among pregnant and postnatal women and children of ages 6–23 months despite multiple initiatives to address them. Micronutrient deficiencies are one form of undernutrition that occur because of insufficient intake or sufficient intake coupled with inadequate absorption due to infection, disease, or inflammation.[1]

Anemia is a public health problem and can negatively affect human capital development in the PT. Anemia is defined as a condition in which hemoglobin concentration and/or the number of red blood cells is lower than normal and insufficient to meet physiological needs. Anemia is associated with poor birth outcomes when it occurs in pregnant women (e.g. higher risk of maternal and perinatal mortality, low birthweight, premature delivery), with impaired cognitive and motor development outcomes in children, and fatigue and low work productivity in adults.[2] Given that anemia is associated with increased morbidity and mortality in women and children, its high prevalence in the Palestinian population is likely to have significant consequences for human health as well as social and economic development. In the GS, anemia is a severe public health problem where more than half of pregnant women and children 6-23 months of age were found to be anemic.[3,4] In the WB, anemia is a moderate public health problem where more than a quarter of pregnant women and children 6-23 months of age were found to be anemic.[5]

High proportions of the Palestinian population are deficient in vitamins A, D, and E. Vitamins A, D and E are fat-soluble vitamins and play key roles in multiple physiological processes namely vision, bone health, and immune function.[6,7] Vitamin A deficiency can have severe effects on the eye and is associated with a weakened immune system. Lack of sufficient vitamin A during early pregnancy may lead to birth defects and fetal mortality. In infants and children, a deficiency in vitamin A can impair growth. Vitamin D is used by the body for normal bone development and maintenance of normal blood levels of calcium and phosphate, which are in turn needed for good skeletal health. Vitamin D deficiency is associated with multiple problems, notably rickets in children and osteoporosis in adults. Vitamin E plays an

"Given that anemia is associated with increased morbidity and mortality in women and children, its high prevalence in the Palestinian population is likely to have significant consequences for human health as well as social and economic development."


Photo: Natalia Cieslik / World Bank

important role in the body's antioxidant network by protecting cells from free radical damage, which is involved in many diseases including heart disease and cancer. According to the Palestinian Micronutrient Survey conducted in 2013 (PMS 2013),[8] which remains the most reliable and comprehensive source of data on micronutrient status to date, around 72 percent of children (6–59 months old) and 47 to 58 percent of pregnant women (depending on the trimester of pregnancy) suffer from low plasma vitamin A. Fifty-four to 68 percent of children (6–59 months old) and 99 percent of pregnant women in their second and third trimesters (18–43 years old) have low vitamin D status. Around 65 percent of children (6–59 months old) and 16 to 42 percent of pregnant women (depending on the trimester of pregnancy) have low vitamin E status.

Main factors leading to micronutrient deficiencies include widespread food insecurity, driven by high levels of poverty; limited access to nutrient-dense foods; and reduction in the variety of the Palestinian diet.[9,10,11] Even before the COVID-19 outbreak and the recent hostilities, nearly a third of the population (around 1.7 million people) were food insecure, of which 80 percent are in the GS and 20 percent are in the WB.[12] In 2021, an estimated 2 million Palestinians were considered moderately or severely food insecure, of which 1.4 million live in the GS and 0.6 million live in the WB.[13,14] This data suggest that iron deficiency anemia and other nutritional deficiencies are likely to contribute to a large extent to the development of anemia. Studies of women and children living in the PT find that poor dietary intake of iron and lack of a diverse diet are major risk factors for anemia.[15,16,17] Although the impact of the COVID-19 outbreak on food security and nutritional status of the Palestinian population is not clear yet, it is expected that the continued political instability, economic decline, and restricted access to markets will have additional detrimental effects. The relative contribution of diseases (parasitic infection and inflammation)[18] and genetic hemoglobin disorders to anemia in the PT is assumed to be low compared to nutritional deficiencies[19] but deserves further investigation.

Current initiatives to improve the micronutrient status of the Palestinian population include universal fortification of flour, supplementation programs targeting high-risk groups, and promotion of breastfeeding and intake of a micronutrient-rich diet. The wheat flour fortification program was mandated by law and initiated by the Palestinian

[19] No cases of malaria were reported by the MoH in the Annual Health Report 2020 (State of Palestine, 2021), and few carriers of thalassemia were reported in the WB, of those tested in 2017 (State of Palestine, 2018). It is assumed that helminth infections that cause blood loss, and thus iron deficiency, are also low, although incidence is not reported by the MoH in 2020.

authorities in 2006. The fortification program was designed to provide 80 percent of the Estimated Average Requirement (EAR) for 10 micronutrients, including vitamins A and D, iron, and folic acid. In addition, iron supplements are distributed to pregnant and postnatal women and children 6–23 months old in primary health care clinics. The program also incorporates the promotion of iron-rich foods, including fortified wheat flour, through health services, schools, and mass media. The Maternal and Child National Nutrition Protocol (MCNNP) provides guidance to service providers on the promotion of breast-feeding, dietary counseling during pregnancy and lactation, and complementary feeding of children 6–23 months old.

Although the effectiveness of these initiatives in addressing micronutrient deficiencies is well-recognized globally, their impact in the PT seems to be limited, as the prevalence of micronutrient deficiencies remains high. Pregnant women and children up to six years old have free access to preventive and curative care at the MoH facilities. In addition, the micronutrient supplementation program, including iron and folic acid supplementation program shows a high coverage (91.4 percent of pregnant women in 2016), and the fortification of flour with iron and other micronutrients is mandated by law. The flour fortification program is currently active, but its impact on nutritional status is uncertain.[20] Testing of fortified flour samples showed inconsistent adherence to the recommended levels of micronutrients suggesting challenges in the implementation of the program. Despite efforts by the MoH and partners to improve quality and coverage of existing interventions, anemia and micronutrient deficiencies are a persistent challenge. There is a need to identify the underlying factors hindering the improvement of micronutrient levels and to find practical and innovative solutions well adapted to the local context.

"Despite efforts by the MoH and partners to improve quality and coverage of existing interventions, anemia and micronutrient deficiencies are a persistent challenge."

OBJECTIVES

Two detailed assessments were conducted in the PT (1) to identify the bottlenecks of anemia prevention and control programs and (2) to explore the feasibility of fortification of edible oil with vitamins A, D, and E. This report aims to present policy makers in the relevant ministries, donors, and partners with a summary of findings from these two detailed assessments.

[20] As part of the PMS 2013, iron was detected in 62 percent of the flour samples retrieved from the West Bank and in 11 percent of those retrieved from Gaza.

METHODOLOGY

Two detailed assessments were conducted (1) to identify the bottlenecks of anemia prevention and control programs in the PT and (2) to examine the feasibility of an edible oil fortification program. Due to the COVID-19 outbreak and conflicts, the assessments largely relied on the use of readily available data for secondary analyses and remote data collection through online/phone surveys, key informant interviews, and focus group discussions. To the extent possible, the assessments collected data from key informants (for example, health care service providers) and beneficiaries through field visits and stakeholder interviews. The detailed methodology for each of the assessments are available in annexes 1 and 2.

ASSESSMENT TO IDENTIFY BOTTLENECKS OF EXISTING ANEMIA PREVENTION AND CONTROL PROGRAMS

The assessment focuses on the following areas and research questions:

1. Targeting—Are the programs targeting the right population?
2. Service delivery—Is the at-risk population receiving adequate and necessary prevention? Are the control measures as planned?
3. Supply—Are the iron supplements at facilities and iron-fortified flour and food products at retail shops available/distributed to beneficiaries?
4. Demand—Are there incentives and barriers to the implementation of prevention and control interventions? How will barriers be managed with the existing resources and programs?

Specifically, the targeting module was designed to identify the prevalence and severity of anemia among high-risk groups by location and socioeconomic and physiological statuses. The service delivery module consisted of mapping and reviewing existing anemia prevention and control (APC) programs. The supply module consisted of a review of the supply chain of iron supplements, including stocks at the facilities and governorates, and of the availability of fortified and nonfortified flour in retail shops. The demand module aimed to identify reported or observed barriers to complying with the recommended APC programs.

ASSESSMENT OF THE FEASIBILITY OF EDIBLE OIL FORTIFICATION WITH VITAMINS A, D, AND E

Given that the current flour fortification program has not proven effective in increasing micronutrient intake and reducing micronutrient deficiencies, the fortification of a new food vehicle is necessary to complement it. Edible oil is a prime candidate for

fortification with fat-soluble vitamins, given that it is widely and frequently consumed as part of the Palestinian diet. Specifically, the MoH asked the World Bank to explore the feasibility of fortifying edible oils with vitamins A, D, and E. With the exception of olive oil, edible oils are not processed in the country, but are either imported in ready-to-sell packages or in bulk from different countries and repackaged locally, which is an excellent opportunity for fortification. Compared to flour, oils have very limited producers/importers, and vitamins can be more easily detected in oils, which makes the monitoring of an oil fortification program more manageable than a flour fortification program. To assess the technical and financial feasibility of introducing an edible oil fortification program, the assessment estimated habitual oil consumption and collected information on the following areas:

1. Industry assessment—assessment of the supply chains for various edible oils, identification of oil and premix supply chains, identification of the industry capacity and fortification needs, and assessment of the level of industry commitment
2. Consumer assessment—analysis of consumer behavior, attitude, and practices related to edible oils and fortification
3. Market assessment—identification of edible oils distribution systems
4. Stakeholder mapping—identification and consultation of all stakeholders potentially involved in the production, regulation, monitoring, and implementation of the program
5. Fortification level calculation—calculation of the appropriate fortification levels and types of fortificants
6. Cost estimations—data collection on the cost of fortificants and costs related to the program implementation and monitoring

FINDINGS

The PT are likely to suffer from negative consequences of micronutrient deficiencies unless more investments are made for prevention and control. Micronutrient deficiencies remain a public health concern, particularly for at-risk population groups in the PT. Despite various efforts by the MoH and other partners, current interventions need to be further strengthened in service delivery, supply availability and management, and demand creation. In addition, the MoH should consider establishing a new intervention targeting the entire population to improve micronutrient intake.

ASSESSMENT TO IDENTIFY BOTTLENECKS OF EXISTING ANEMIA PREVENTION AND CONTROL PROGRAMS

Children under five years old, adolescents, women of reproductive age (15–49 years), and pregnant women are the most vulnerable to anemia in the PT. This is similar to other countries and mainly due to increased iron needs related to growth, fetal

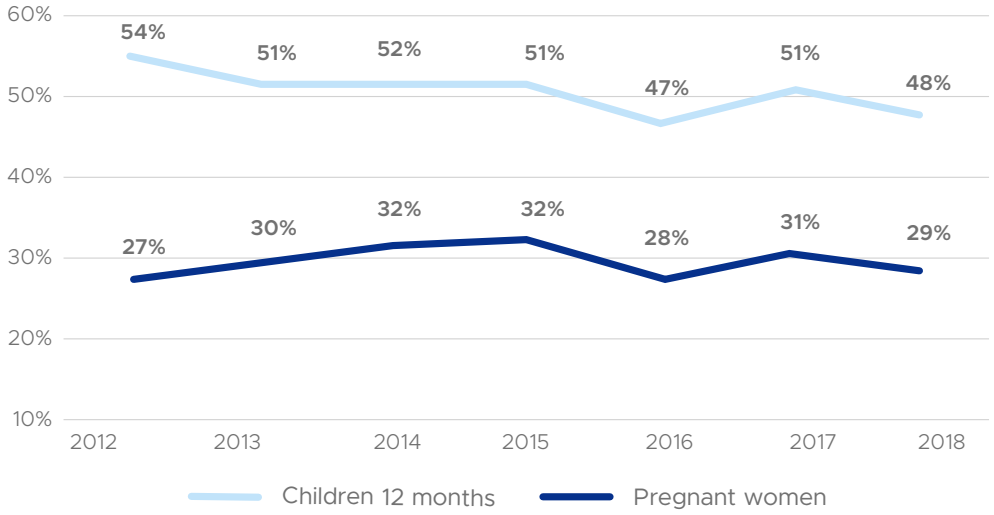
development, and losses of blood during childbirth or menstruation. Tables 1 presents the prevalence of anemia among high-risk groups in the PT and the corresponding World Health Organization (WHO) classification to determine the public health significance of anemia at the population level. Among the at-risk population groups, pregnant women and children 6–23 months old are the most vulnerable. By region, the prevalence of anemia is higher in the GS than in the WB across all subpopulation groups. The prevalence has remained static during the last decade in the PT (see figure 1).

Table 1: Prevalence of anemia in the Palestinian territories

POPULATION GROUP	REGION	PREVALENCE OF ANEMIA	DATA SOURCE (YEAR)	PUBLIC HEALTH PROBLEM
Pregnant women	GS	57%	HAR (2020)[3]	Severe
	WB	27%	HAR (2019)[5]	Moderate
Children 6–23 months*	GS	55%	NNSS (2018)[4]	Severe
	WB	39%	HAR (2019)	Moderate
Children 2–5 years	GS	21%	PMS (2013)[8]	Moderate
	WB	15%	PMS (2013)	Mild
Postnatal women	GS	35%	PMS (2013)	Moderate
	WB	25%	HAR (2018)	Moderate
Adolescents 15–18 years (Male)	GS	12%	PMS (2013)	Mild
	WB	9%	PMS (2013)	Mild
Adolescents 15–18 years (Female)	GS	22%	PMS (2013)	Moderate
	WB	19%	PMS (2013)	Mild

*The prevalence reported for this age group by the Health Annual Report (HAR) and National Nutrition Surveillance System (NNSS) corresponds to anemia testing at 12 months of age.

Figure 1: The prevalence of anemia at the national level from 2012 to 2018



Source: NNSS

Certain characteristics among the at-risk groups are associated with lower hemoglobin levels or a higher prevalence of anemia in the PT. In particular, based on bivariate and multivariate analyses using the Palestinian Micronutrient Survey 2013 (PMS 2013) data, those with the following characteristics are more likely to be anemic: iron deficient, residing in the GS, deficient in vitamin A and folic acid (for pregnant and postnatal women and adolescents), having an infection (fever or diarrhea; for postnatal women and children), not taking iron folic acid (IFA) tablets regularly (for pregnant and postnatal women), not taking IFA tablets during or after pregnancy (for postnatal women), lacking awareness about the fortified four (for postnatal women), having lower consumption of iron-rich food (for pregnant women, adolescents, and children), being in the second or third trimester of pregnancy, being a child 6–11 months old, and being a female adolescent (15–18 years old). This highlights how demand-side constraints are significant in the PT. For details of the analysis results, refer to annex 1.

Targeting

Anemia prevention and control (APC) programs target the most vulnerable groups in the PT. The programs consist of two main interventions: a food fortification program and an iron supplementation program. The fortification program aims to increase the intake of iron and other micronutrients for the entire population by adding 10 micronutrients to wheat flour. The MoH and United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA) distribute iron supplements to pregnant and postnatal women and children 6–23 months old. This aligns with the supplementation program inclusion criteria by the WHO and has been designed to respond to the high prevalence of anemia in the PT. In addition, health care workers are trained to provide nutritional guidance and promotion of breastfeeding and complementary feeding as per the Maternal and Child National Nutrition Protocol (MCNNP).

Service delivery and supply

The MoH orders iron and folic acid (IFA) supplements based on the push-based approach. The push-based procurement approach of IFA tablets could be a constraint in a context where demand does not materialize. Information about the frequency of stockouts of iron supplements was not available as MoH facilities do not report such information to the central level. However, according to health care providers interviewed at central, governorate, and facility levels, the occurrence of stockouts of iron supplements is rare.

Current IFA supplementation program does not meet the needs according to the national guidelines. In 2019, the MoH estimated iron supplementation needs that covered only 77 percent of those who should receive iron supplementation based on the MCNNP (based on number of pregnant women receiving antenatal care [ANC] services). The amount of iron folic acid (IFA) tablets distributed by the MoH to its clinics is substantially lower (61 percent) than the amount needed to meet the iron supplementation

needs. The gap in identifying adequate amount of iron supplements is due to how the needs are calculated. The MoH orders iron supplements for pregnant women based on previous orders, not based on actual needs of the number of participating pregnant women and their recommended intake of IFA. The past order is not the accurate indicator, as beneficiaries may not have complied with their iron supplementation schedule and quantity due to the late start of ANC, insufficient nutritional counseling (both frequency and quality), and inadequate follow-up and monitoring of the compliance with the iron supplementation by the target population.

IFA tablets may not be dispensed as recommended. Interviewed health care providers did express concerns that the technical guidance is not comprehensive enough for anemia prevention, which suggests that health care providers may not be proactively providing tablets, according to the protocol, to beneficiaries who do not request them.

Quality of care is a probable bottleneck. The monitoring process of iron supplementation activities registers the volume of supplements dispensed but does not collect data on patient compliance with the supplementation schedule. Interviewed health care providers considered that their patients' compliance with iron supplementation was satisfactory, however, no information is available on the level of compliance.

The food fortification program is not contributing to the increase in iron intake as expected. Only 3 to 5 percent of the flour sampled for spot checks was confirmed to be compliant with the national standards. The monitoring and enforcement capacity within the Palestinian authorities is limited due to insufficient budget and human resources.

Demand

There are no significant cultural barriers impeding available interventions, but both beneficiaries and service providers reported gaps in the quality of care. In the PT, the target population does not seem to have beliefs or cultural practices that could prevent them from engaging in APC activities. However, some beneficiaries reported their dissatisfaction with the interventions due to the lack of information sharing about possible side effects of iron supplementation and their management and poor communication between beneficiaries and health care providers. On the other hand, some health care providers reported the lack of adequate training on nutritional counseling and effective patient-provider communication.

ASSESSMENT OF THE FEASIBILITY OF EDIBLE OIL FORTIFICATION WITH VITAMINS A, D, AND E

An edible oil fortification is a technically and financially feasible option in the PT to improve intake of vitamins A, D, and E. Summaries of the assessment results are provided below, and details are available in annex 2.

Consumption

Based on available literature and data on the import, production, and export of edible oils, it is estimated that in the PT, 25-40 grams of edible oil (excluding olive oil) are consumed per person per day. Most common edible oils are sunflower oil, corn oil, olive oil, soybean oil, and palm oil. Except for olive oil, these oils are all imported mainly from Egypt, Ukraine, Turkey, and Malaysia. Sunflower and corn oils are widely used in households, whereas palm oil is common in the food industry (restaurants).

Repacking industry

Two repackaging plants are present in the WB, but none exists in the GS. Therefore, a combination of local fortification at repackaging plants and importation of already fortified oils should be considered. Fortification plants would need to invest around US$12,000 (per plant) for fortification and postprocessing—that is, for equipping a tank, piping, dosing pump, agitation/mixer, and so forth.

Monitoring for quality control/assurance

Different monitoring strategies need to be established between the WB and GS, given that the GS needs to fully rely on importing fortified oils. While edible oil repackaging plants can be equipped for fortification in the WB, fortified oil must be imported into the GS. This leads to different control strategies at different levels (i.e., border, production site, warehouse, market, and household levels) in two regions. If fortified oils are imported, a thorough inspection of imported oils with approved technical specifications needs to be conducted at customs/border level. In WB, if the edible oil is fortified at repacking plants, two forms of monitoring are required: internal and external monitoring. Internal monitoring is performed by the plant itself to ensure compliance with the required fortification levels. External monitoring must be conducted by the appropriate authority to endorse compliance with fortification guidelines. To do so, accredited laboratories will need to be identified and supported with regular external quality controls for the measurement of vitamins in oil, availability of chemicals, and other necessary supplies and consumables. Monitoring at warehouse and market levels will need to be done on a regular basis. Additional capacity building is necessary for customs to enforce import regulations at the border with thorough monitoring and inspection.

Fortification level calculation

In order to decide on the fortification levels, the MoH is presented with three possible scenarios to choose from. The optimal fortification formula for edible oils would be 12 mg of vitamin A, 300 µg of vitamin D, and 300 mg of vitamin E per kilogram of oil. This is based on a conservative fortification level and calculated based on an estimated intake of 25 grams of edible oils per person and EAR coverage of 50 percent. The proposed vitamin E content optimizes the ratio of vitamin E to polyunsaturated fatty acids, which protects the oil from damages and prevents deficiencies. To decide adequate

fortification level, the MoH needs to decide how the edible oil fortification program can be managed with an existing wheat flour fortification program. The co-existence of two fortification programs that cover the same nutrients might not be ideal, due to the possible toxicity caused by an overconsumption of vitamins. Table 2 presents three different options for fortification level calculation.

Cost

Additional cost in fortified oil would be minimal in the final produce price. The cost of the premix (vitamins A, D, and E) only adds about US$0.014 to a kilogram of fortified oil. If the MoH decides to change the vehicle for vitamin A and D fortification from flour to oil, the MoH would save about 47 percent of the premix cost. The same amounts of vitamins can be delivered with a saving of approximately US$0.2 million a year by only changing the vehicle from flour to oil. On the other hand, fortifying the two food vehicles with the same vitamins would result in an additional cost of approximately US$ 0.5 million per year

Implementation and stakeholders

Implementation of an edible oil fortification program will require a legal process led by the MoH. Representatives of the main stakeholders (the MoH, Ministry of National Economy [MoNE], Palestinian Standards Institution [PSI], Palestinian Food Industries Association, Food Union) will need to form a committee for the edible oil fortification program. To legalize the edible oil fortification program, the MoH will need to discuss a draft law and its technical application with the PSI. The MoH would need to form a technical regulations committee to establish national regulations in edible oil fortification with relevant stakeholders. The national regulations would need to be raised with the Parliament to become law, with an implementation decree by the MoH. During the implementation phase, the MoH will need to closely work with relevant stakeholders, such as the MoNE, for training and importation processes. In addition, the MoH would need to work with different ministries and partners involved in sample testing (Ministry of Agriculture for chemical residues), food distribution (UNRWA and World Food Programme [WFP]), and health promotion (United Nations Children's Fund [UNICEF] and WHO).

Table 2: Options for vitamin fortification in two vehicles (flour and oil)

OPTION	DESCRIPTION	PREMIX COST (US$/year/total population)	ADVANTAGES	CHALLENGES
1	Vitamins A and D will remain in the flour fortification program, and only vitamin E will be added to edible oils.	1,464,563	• Increased amount of vitamin E in the food supply A negligible increase in the price of oil after fortification. • Provision of an antioxidant property to the oil by the added vitamin E and prevention of its oxidation and rancidity.	• The solubility of vitamins A and D remains low, which would hinder bioavailability upon consumption. • Risks of failures during the implementation of the new program (obstacles in monitoring, lack of commitment from industries, etc.).
2	Vitamins A and D will be excluded from the flour fortification program, and vitamins A, D, and E will be added to edible oils.	1,277,500	• Higher solubility of vitamins A, D, and E in oil than flour. Higher amount of vitamin E in food supply. • Provision of an antioxidant property to the oil by the added vitamin E, and prevention of its oxidation and rancidity. • Added vitamin E also prevents degradation of other vitamins present in the oil. • The cost of the premix for flour fortification will decrease by 47 percent.	• Risks of failures during the implementation of the new program (obstacles in monitoring, lack of commitment from industries, etc.).
3	Vitamins A and D will remain part of the flour fortification program, and vitamins A, D, and E will be added to edible oils.	1,756,563	• Higher solubility of vitamins A, D, and E in oil than flour. Higher amounts of vitamin A, D, and E in food supply. • Provision of an antioxidant property to the oil by the added vitamin E, and prevention of its oxidation and rancidity. • Added vitamin E also prevents degradation of other vitamins present in the oil.	• Addition of vitamins A and D to flour and oil will require monitoring of fortification of two food vehicles. • Risks of failures during the implementation of the new program (obstacles in monitoring, lack of commitment from industries, etc.). • Significant increase in the cost of the fortification. • A daily vitamin intake reaching 95 percent of the upper limit (of vitamin A) in some (rare) cases.

RECOMMENDATIONS AND WAY FORWARD

The assessment results highlight the burden of persistent micronutrient deficiencies and actions that can be taken to improve the coverage and quality of interventions in the PT. In particular, the coverage and quality of existing interventions can be improved by revising iron supplements stock management, strengthening quality of care in nutrition counseling, raising awareness about the importance of adequate micronutrient intake and about the existing APC and fortification programs to increase demand, and strengthening monitoring and evaluation systems for service delivery and fortification enforcement (refer to annex 3 for details).

While the report identifies challenges and opportunities based on readily available data, collection of more recent data on biomarkers and dietary intake is necessary. The report relies on the most comprehensive datasets, such as PMS 2013, but up-to-date nutrition data is critical to assess the burden and design more context-specific interventions. For example, to design the edible oil fortification program, more recent data on vitamins A, D, and E deficiencies and dietary intake among the Palestinian households are critical to determine an adequate fortification level (i.e., amounts of vitamins to be added into edible oils).

To improve the quality and coverage of APC interventions, the existing service delivery system needs to be strengthened. First, IFA supplementation needs should be calculated for each specific target group by using the number of registered users and the schedule established in the MCNNP. To increase the IFA supplementation delivery, MoH facilities can take an integrated approach by providing IFA tablets to children who visit the facilities for other services, such as routine immunization and deliver IFA tablets during home visits. IFA tablets stocks at central warehouses and MoH facilities should be reported to relevant departments at the MoH to accurately monitor IFA tablet dispensary and orders. Capacity building for the health care providers at MoH facilities should be sought through pre-service and in-service training and supportive supervision. Capacity building should include how to provide counseling regarding iron supplementation (during antennal, postnatal, and childcare). In addition, tailored communication campaigns can raise awareness among women, mothers and children on the importance of IFA supplementation through mass and social media or through influential personnel in the community.

Edible oil fortification is a potential additional platform for improving micronutrient deficiencies. From both technical and programmatic perspectives, an edible oil fortification program, if implemented, has high chances of success as oil is a more suitable vehicle for fortification with fat-soluble vitamins and the monitoring processes are simpler

than those for flour fortification. Vitamins A and D are more soluble in oil and can be measured more adequately in oil than flour. Edible oil is mainly imported or processed in two repacking plants in the WB, which makes the monitoring more manageable than that of the many small mills that process flour. To establish a new and feasible edible oil fortification program, the MoH and relevant authorities should first decide the quantity of vitamins to add in edible oils. This should be based on what option best addresses the population needs, taking all health and economic variables into consideration. If the edible oil fortification is implemented, both local and source fortification should be considered to complement each other to fully support the program objective. The enforcement of local fortification removes the technical barrier to trade, and this step is mandatory for the PT to be able to import fortified food commodities.

Opportunities for strengthening the demand and uptake of micronutrient supplements and fortified products exist within ongoing World Bank projects. The MoH implements activities to improve caregivers' parenting skills in promoting healthy development of children under the Improving Early Childhood Development in the West Bank and Gaza program, financed by the World Bank. The project aims to develop and pilot a parenting intervention for families and is currently in the implementation phase. The parenting intervention will consist of interactive information sessions for pregnant women and caregivers of children 0–36 months old, which can be leveraged to counsel beneficiaries about available APC services and the importance of compliance with recommended practices for positive health benefits . In addition, Social Protection Enhancement Project and Emergency Social Protection COVID-19 Response Project targets poor households with cash transfer programs. The target beneficiaries are likely to be food insecure and at risk of micronutrient deficiencies. The findings can help design appropriate resource materials for the households to improve diverse micronutrients intake, along with available APC services.

At the request of the MoH, the World Bank will continue to provide additional technical and financial support in materializing recommendations from the assessment results. Particularly, the MoH would like to develop a comprehensive road map for the edible oil fortification program. This requires having a technical expert(s) working with the MoH side by side for the program design, including costed implementation and a monitoring and evaluation plan. In addition, the MoH needs technical and financial support in strengthening laboratory capacities; conducting spot checks of samples; establishing/revising technical regulations; building capacity for monitors at points of entry, repacking plants, and retail shops in markets; and equipping the repacking plants for local fortification of edible oils with premix.

The assessment results will be widely distributed to all relevant stakeholders to help inform their programs and interventions in the PT. Some donors have shown a strong interest in using the assessment results, particularly on anemia, to inform their support in strengthening maternal and child health service delivery in the PT.

The assessment can help inform interventions to address micronutrient deficiencies in similar contexts. Countries with socio-economic and cultural contexts similar to those in the PT will benefit from the results and recommendations to better understand determinants of high prevalence of anemia. In addition, the results from the edible oil fortification feasibility study highlight an opportunity with a sustainable intervention at the population level to reduce fat-soluble vitamin deficiencies in high-burden countries (for example, countries in the Middle East and North Africa).

ANNEXES

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