

Review Article

Progress in Egypt's Sustainable Development Goals from a Public Health Nutrition Perspective

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Abstract

The Sustainable Development Goals (SDGs) include several nutrition-focused goals. Nutrition has direct effects on the second and third SDGs, namely achieving zero hunger and good health and well-being, as well as indirect effects on the first, fifth, sixth, eighth, and seventeenth. Achievement of SDG goals is a prerequisite for meeting the global nutrition targets by 2025. Despite some improvement, Egypt is falling short of meeting the majority of the nutrition targets. From a public health nutrition perspective, there are several gaps in progress toward the SDGs related to nutrition policies, programs, or intervention levels. Political commitment, multisectoral cooperation, adequate financing, scaling up existing interventions, delivering new policies, and incorporating best practices into national policies are crucial for accelerating nutrition progress. Investing in data needed and the capacity to use it, health system capacity building, service providers training, informing beneficiaries, program monitoring and evaluation, and establishing a nutrition surveillance system to adequately inform policy formation are crucial to achieving the target. In order to provide nutrition interventions in an integrated manner, a multi-systems approach should focus on the food, health, water, and sanitation systems, as well as the education and social protection systems. The food system must support low-cost and nutritionally diverse diets, healthy food environments, and positive practices. In addition, legislation, labeling, taxes, and marketing regulations are significant. In generating evidence, science and academia play a crucial role in accelerating the progress of SDG targets. This article reviews the nutritional problem in Egypt and concludes that long-term sustainable development in Egypt cannot be achieved unless malnutrition is effectively addressed (especially in anemia among preschool and school children, exclusive breastfeeding, and overweight and obesity in adolescents and adults).

Keywords: Sustainable Development Goals (SDGs), public health nutrition, Developing countries, Middle-income countries, Egypt

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BACKGROUND

SDGs goals that are directly or indirectly related to nutrition:

In 2015, 17 SDGs were adopted to eradicate poverty, protect the planet, and improve the lives and prospects of everyone by 2030. ⁽¹⁾ Nutrition has a direct impact on both the second and third SDGs, namely ending hunger, ensuring food security, eradicating malnutrition (including achieving global nutrition goals by 2025), and promoting health and well-being for all ages. ⁽²⁾ By 2025, the WHO targets to reduce undernutrition, anemia, and low birth weights among children under five by 40, 50, and 30%, respectively, while increasing exclusive breastfeeding during the first six months by 50%. ⁽³⁾ They also aim to prevent further increases in children's obesity and malnutrition. Nutrition indirectly affects other six

SDGs (SDGs 1, 4, 5, 6, 8, 17). Due to improved learning, cognitive performance, and increased productivity, adequately nourished children are 30% more likely to avoid poverty ⁽⁴⁾ (SDG 1: No poverty and SDG 4: Quality education). In case of enhancing the academic performance of well-nourished schoolgirls ⁽⁵⁾, this will help in advancing gender equality (SDG 5). In addition, good nutrition and improved education result in improved personal hygiene (SDG 6). Malnutrition costs the global economy approximately 10% of its GDP ⁽⁴⁾, decreasing the likelihood of achieving SDG 8. Finally, nutrition is interdisciplinary, and investments in nutrition through global partnerships yield a substantial return; spending one dollar to address malnutrition results in a return of sixteen dollars ⁽⁶⁾ (SDG 17: Partnership for the goals). Improving nutrition is fundamental for global sustainability. Nutrition is both a builder and an indicator of

development, and almost all SDGs have an impact on nutrition.

Global malnutrition Epidemiology:

Globally, malnutrition remains a challenge. Currently, one in every five children under the age of five is stunted worldwide, 6.7% are wasted^(7,8), 40% are anemic⁽⁹⁾, and one in every three children suffers from vitamin A deficiency.⁽¹⁰⁾ All these factors limit children's ability to grow and survive. Reports have demonstrated that 5.7% of children are overweight globally. Furthermore, the prevalence of adult obesity continues to rise, increasing from 11.8 % in 2012 to 13.1 % in 2016⁽¹¹⁾. Moreover, one in three women of reproductive age (WRA) is anemic⁽⁹⁾, and this rate has increased over the last decade. Worldwide, 12.0% of countries have low iodine consumption, and 17.0% are at risk for zinc deficiency.^(12, 13) Due to the COVID-19 pandemic, actual malnutrition rates are anticipated to be higher. According to conservative estimates of COVID-19's potential effects, moderate and pessimistic scenarios may result in an additional 5 to 7 million children may be stunted and 570 thousand to 2.8 million more wasted in low- and middle-income countries by 2030.⁽¹⁴⁾ Consequently, child mortality will also increase if the rise in child wasting is not prevented. Child wasting prevention and management require urgent global attention.

Egypt's nutrition profile for achieving global nutrition targets and nutrition-related SDGs includes:

Egypt is categorized as one of the countries in a nutritional transition stage characterized by moderate to severe malnutrition and widespread micronutrient deficiencies. Egypt has an annual Census of 104 million as per Central Agency for Public Mobilization and Statistics (CAPMAS) 2019. Children under the age of five account for about 13.6% of the total population⁽¹⁵⁾. In Egypt, approximately eight out of every ten childhood deaths occur before first birthday.⁽¹⁶⁾ With regard to **SDG 3**, Egypt has made significant progress. Between 1995 and 2021, the under-five mortality rate decreased from 81 deaths per 1,000 live births to 28 fatalities. According to the 2014 Egypt Demographic and Health Survey (EDHS), there are 27 deaths for every 1000 live births, and the results of the Egyptian Family Health Survey 2021 (EFHS)⁽¹⁷⁾ indicate that that rate has increased to 28 cases per 1,000 live births (this is in conjunction with COVID-19 pandemic).⁽¹⁷⁾ Maternal mortality rate is on track to maintain SDGs achievement. It is also worth mentioning that suboptimal **Exclusive breastfeeding (EBF)** is a significant risk factor for malnutrition. The EBF target has not been met and has deteriorated over

the years (38%, 53%, and 40%, according to EDHS 2005, 2008, and 2014, respectively). The regional average for exclusive breastfeeding was determined to be 34%, with the lowest rates recorded in Yemen (9.7), Kuwait (11%), Tunisia (13%), Lebanon (15%), Oman (23%), Jordan (25%), Iraq (26%), Qatar (29%) and Morocco (35%). The highest rates were reported from Iran (53%) and Sudan (55%). In addition, a downward trend in the prevalence of EBF has become apparent in Morocco, Lebanon, Oman, Sudan, and Yemen. Conversely, an upward trend was observed in Iran, Iraq, and Palestinian (26.6% in 2010 and 38.6% in 2014).⁽¹⁸⁾

In Egypt, **stunting** showed a swinging trend over the years (Figure 1). It increased from 25 % in 1992 to 30% in 1995, then showed a decreasing trend from 1995 to 2008 due to increased income and increased food intake⁽¹⁹⁾. After the outbreak of avian influenza and the food price crisis, it elevated to 30 % in 2008. The rate of stunted children decreased from 21% in EDHS 2014 to 13% according to the EFHS 2021 (Figure 1), which is lower than the average for the Middle East and North Africa (15.8%)⁽¹⁷⁾. The stunting rate rises in rural Upper Egypt to reach 16% and falls to less than 10% in urban Lower Egypt. This information should direct the development of nutrition-sensitive social protection programs for at-risk groups. As for **wasting** and underweight, both showed increasing trends over the years till 2014 (wasting 3 % in 2000 to 8% in 2014). According to EFHS 2021⁽¹⁷⁾, wasting showed a decreasing rate among children under 5 (from 8% in 2014 to 3% in 2021) (Figure 1). As for underweight, it decreased from 6% to 3.7% in 2021. In the meantime, there are insufficient data to evaluate Egypt's progress toward its low birth weight goals. Therefore, Egypt has made some progress towards achieving the target for wasting and stunting. Stunting and wasting rates in countries with conflict like Syria (27.9 and 11.5 in 2010), Yemen (46.4 and 16.4 in 2013), Libya (38.1 and 10.2 in 2014), and Sudan (36.4 and 13.6 in 2019) were higher than those reported in Egypt.⁽²¹⁾ The lowest stunting rate (6.4 %) was reported in Kuwait.⁽²¹⁾

Between 2014 and 2021, data indicated worsening anemia among children under 5 and school age (Figure 2). The percentage increased among children aged 6-59 months from 27% to 43% (higher than the regional average of 42%)⁽¹⁷⁾ and from 20% to 41.6% (highest in the Red Sea, the New Valley, and Assiut Governorates) among school-age children.⁽²²⁾ According to EFHS 2021, there are few differences between urban and rural areas, as well as between girls and boys, in terms of anemia in children under the age of five. Anemia is exacerbated by low socioeconomic status, drinking tea immediately after meals, the high cost of iron rich food and parasitic infection. In Egypt, children aged 6 to 23 months who consumed iron-rich

foods decreased from 65.6% in 2008 to 53% in 2014. This result is consistent with FAO Egypt food balance sheet data indicating a decrease in protein consumption from 101 g/capita/day in 2010 to 93 g/capita/day in 2020⁽²³⁾ According to data from the WHO Global Health Observatory, Yemen had the highest prevalence of childhood anemia at 79%, followed by Somalia and Sudan (51%), Syria (33%), Jordan (33%), Morocco (30%) and Iraq (30%), and Kuwait and the United Arab Emirates at 20%⁽²⁴⁾. Many of the challenging factors for Egypt's

malnutrition trends are associated with 1) the unaffordability of healthy diets due to high prices, resulting in household food insecurity, 2) the poor care, infant feeding practices, and lack of nutrition awareness, which are significantly influenced by high urbanization and female workload, 3) helminthic infection, and 4) in sparsely populated and newly settled areas, it may be challenging to obtain adequate health services, and the existing essential services must be revised to address malnutrition more effectively.⁽²⁵⁾

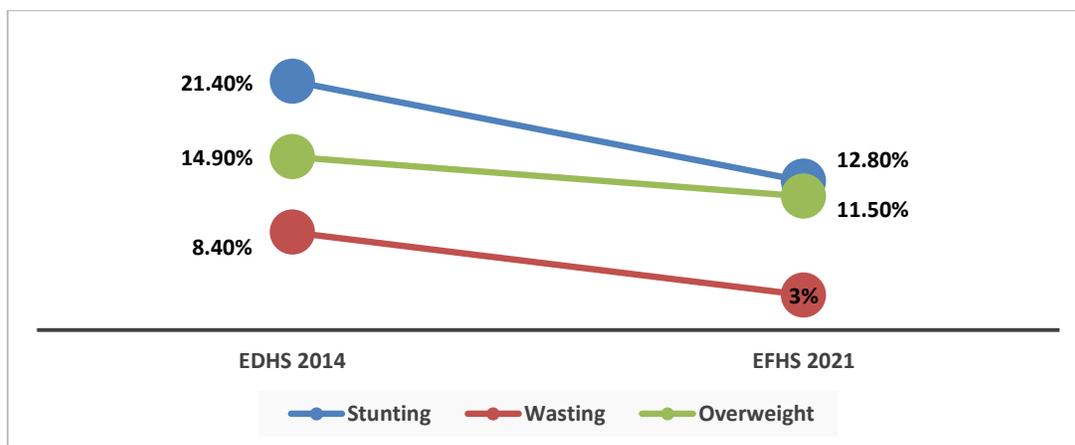


Figure 1: Trends in Stunting, wasting, and overweight prevalence among under five children: Egypt 2014-2021

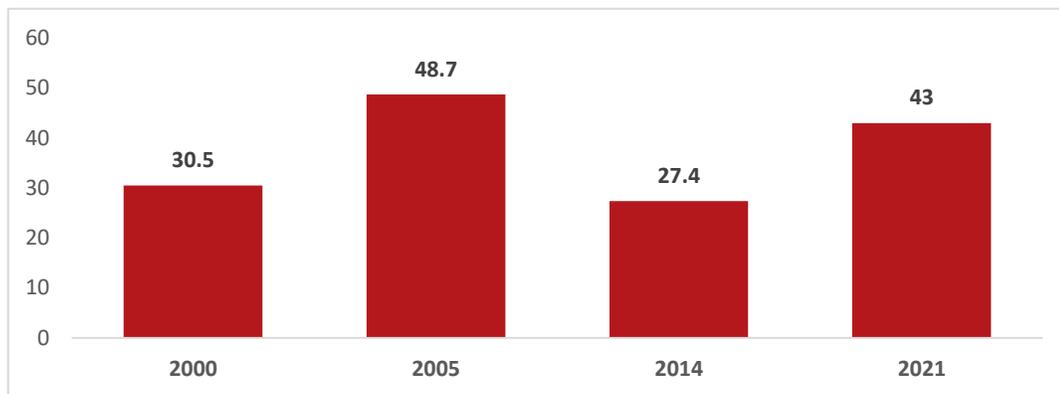


Figure 2: Trends in anemia among under five children across wealth quintiles: Egypt, 2005-2021
Sources: Egypt, Source: Data based on EDHS 2000-2014 and EFHS 2021

On the contrary, **obesity and overweight** have increased steadily since the 1990s until 2014⁽¹⁶⁾. In 2014, up to 15% of children **under the age of five** and 35% of 5-19 years old children and adolescents were overweight⁽¹⁶⁾. Among the encouraging results of the EFHS 2021⁽¹⁷⁾ is the decrease in overweight under-five children (12%) (Figure1). There is a significant disparity in the prevalence of childhood obesity between countries, with Libya having the highest rate (29.6 % in 2014), compared to only 2.5% in Yemen (2013) and 3.2% in Sudan and Somalia

(2019). The percentage of overweight children is higher in urban Lower Egypt. **School children and adolescents** (ages 5 to 19) are essential segments of the population disproportionately affected by inadequate diets and subsequent malnutrition; nevertheless, current global targets do not explicitly include them. The President's Early Detection Campaign for malnutrition in school children, which is part of Egypt's Presidential Initiative of 100 Million Healthy Lives Campaign, was conducted on 10,711,525 students starting in 2019. It was

determined that the prevalence of obesity, stunting, and underweight among school students was 13% (highest in Alexandria, Damietta, and Cairo cities), 3.7% (highest in Aswan, Matrouh, and Menya Governorates), and 3.8%, respectively⁽²²⁾. In 2014, 27% of girls aged 5 to 19 years were overweight, 10% were obese, and 25% of boys were overweight and 11% were obese, according to EDHS data spanning 2005 to 2014.^(16, 20) Studies on school-aged children from Egypt also found a high prevalence of overweight and obesity in primary school students. It ranged from 11.1 to 23.7% and 8.2 to 19.5%, respectively, in 5 studies conducted between 2010 and 2020.⁽²⁶⁻³¹⁾ Only two percent or less of children are thin.⁽¹⁶⁾ In 2016, the prevalence of obesity among school-aged children (6-9 years old) in the Eastern Mediterranean Region (EMR) was 10.5%, while the prevalence of overweight was 22.5%. In the region, 18.5% of boys and 19.7% of girls aged 10 to 19 were overweight, while 6.8% and 7.0%, respectively, were obese. In the Gulf region, Egypt, and Lebanon, as well as, to a lesser extent, in Libya and Iraq, rates were especially high.⁽²¹⁾

Egypt has made no progress towards its adult obesity goal, with an estimated 50.0% of adult women and 26.4% of adult men being obese.⁽³²⁾ The prevalence of overweight and obesity increased from 78 % in 2008 to 85 % in 2014^(16, 20) among women and increased from 53 % to 61 % in 2015 among men^(20, 32) (Figure 3).

In 2015 EHIS, women, and men from rural Upper Egypt and the Frontier Governorates were less likely to be overweight or obese. The highest level of obesity in EMR was reported in Bahrain (42.8, 2018), Kuwait (37.9, 2016), Qatar (35.1, 2016), Saudi Arabia (35.4, 2016), Jordan (35.5, 2016), Lebanon (32.0, 2016), Libya (32.5, 2016), and UAE (27.8, 2017). The prevalence of adult obesity appears to be on the rise in the majority of countries in the region, with the trend being most pronounced in the UAE, Tunisia, Kuwait, Bahrain, and Lebanon.^(11, 21) As per FAO Egypt food balance sheets, vegetable consumption among Egyptians decreased from 132 kcal/capita/day in 2010 to 103 kcal/capita/day in 2020⁽²³⁾. In contrast, fat and sugar consumption increased from 57.7 g/capita/day in 2014 to 62.5 g/capita/day in 2020 and from 253 kcal/capita/day in 2010 to 264 kcal/capita/day in 2020, respectively⁽²³⁾. In conjunction with lower levels of physical activity or the absence of safe neighborhoods for walking, these dietary patterns contribute to sharp increases in obesity.⁽³³⁾

Long-standing food subsidy programs in Egypt have a significant impact on Egyptians' diets. It emphasizes energy-dense foods and excessive calorie consumption by Egyptians, particularly poor groups, increasing the likelihood of being overweight. Rising food prices and food inaccessibility have led more families to revert to calorie-dense foods rather than consume nutrient-rich foods⁽³³⁾.

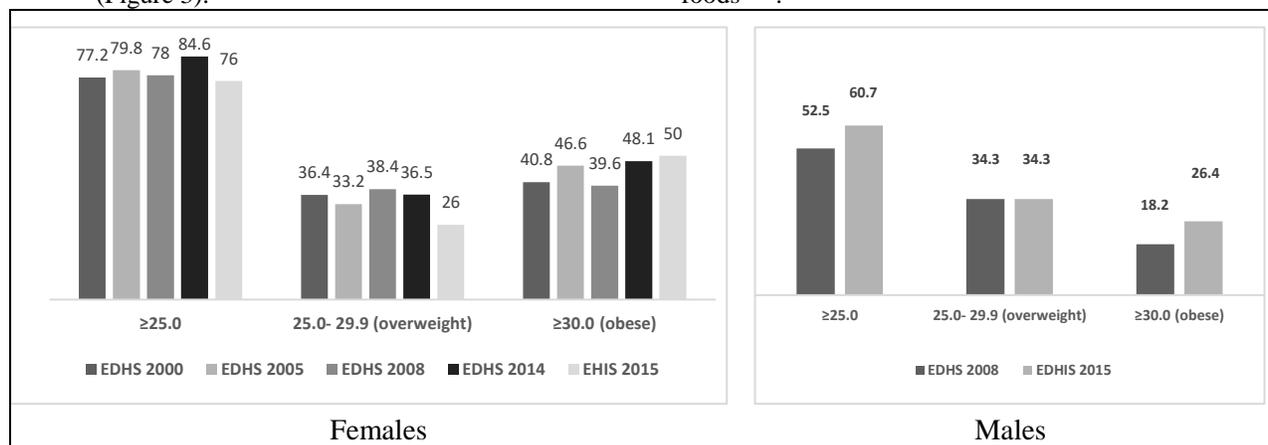


Figure 3: Trends in overweight and obesity among adult Egyptian females and males

According to GHO data, some progress has been made towards the goal of reducing **anemia among WRA**, with 28.3 % of women aged 15 to 49 years affected in 2019.⁽³⁴⁾ The previous national surveys indicated that anemia among WRA and pregnant women was 25% and 20 %, respectively, as per DHS 2014, compared to the 2005 EDHS that reported that iron deficiency anemia among WRA is 40%.^(16, 20) The percentage of women who reported using iron supplements during

their most recent pregnancy increased from 42.5% in 2008 to 67% in 2014. The anemia rate among Egyptian WRA is lower than the regional prevalence (37%) as well as lower than Yemen (57%), Sudan (37%), Bahrain (35%), Syria (33%), Tunisia (32%), Morocco (33%), and Jordan (34%), but higher than Kuwait and UAE 23%.⁽³⁵⁾ Egypt is not on track to meet a number of the global nutrition targets (Table 1) (especially under five and school children anemia,

exclusive breastfeeding, and overweight and obesity in adolescents and adults).

Table 1: Egypt's Progress towards the Global Nutrition Targets

	Childhood stunting	Some progress		Obesity in men	Off course
	Childhood wasting	Some progress		Obesity in women	Off course
	Childhood overweight	Some progress		Raised blood pressure	Off course
	Childhood Anemia	Off course		Anemia in WRA	Some progress
	Low birth weight	No data		Diabetes	Off course
	Exclusive breastfeeding	Off course			

Egypt Pending gaps in the progress toward SDGs from a public health nutrition lens and Opportunities for Scaling Up:

In order to achieve the SDG goals, effective nutrition interventions and programs must be efficiently delivered to those in need. The SDGs examined are SDGs 1, 2, 5, 10, and 3, which are eliminating poverty, ending hunger, promoting female empowerment and gender equality, and disease prevention, respectively.

Food insecurity, socioeconomic and environmental challenges:

In Egypt, nutritional challenges and food insecurity (SDG 2) are linked to low-income and high food prices among the most underprivileged groups of society, poor dietary practices, and a lack of nutritional awareness among the public as opposed to concerns with food availability. Drivers that are external (e.g., conflicts or climate shocks) and internal (e.g., low productivity and inefficient food supply chains) to food systems are elevating the cost of nutritious foods; when combined with low incomes, they increase the unaffordability of healthy diets.⁽¹⁴⁾ Subsidized food in Egypt may lower the rate of stunting and wasting but not micronutrient deficiencies (not fortified) and obesity rates. In Egypt, the percentage of the population whose food intake is insufficient to meet dietary energy requirements in 2019-2021 was 5.40%, a 0.8% increase from 2015. The prevalence of moderate and severe food insecurity in Egypt (3-year average 2019-2021) was 27.3%.⁽³⁶⁾ Egypt failed to reduce the number of people living below the national poverty line by half, making SDG 1 the most challenging. Expenditure and Consumption Survey 2019 has shown that poverty in Egypt increased from 27.8% in 2015 to 32.5% in 2018 (32

million people below the national income poverty line in 2018), but it decreased to 29.7 in 2019/20 (over 60% in the Asyut and Suhag governorates) (Figure 4).^(37,38) In contrast, the growth rate in Egypt reached 4.4% in 2015 and increased to 5.3% in 2018. A series of crises since 2005 (including the 2006 avian influenza epidemic, the food, fuel, and financial crises of 2007–2009, the increase in global food prices from late 2010, and a challenging economic situation following the 2011 revolution, the COVID 19 pandemic, and the outbreak of the Russia-Ukraine war in 2022) led to a price increase that masked any income growth between the end of 2015 and mid-2018. Between 2015 and 2018, there was a 33% increase in the annual income of households, while prices rose by 59%.^(37,38)

Other gaps are related to SDGs 5 and 10. Although the prevalence of female secondary school enrolment increased from 77 % in 2014 to 83% in 2020⁽³⁹⁾, the Egypt Gender Inequality Index in 2019 was 0.45, and the female employment rates in Egypt are decreasing.⁽⁴⁰⁾ The empowerment of women improves household nutrition, and empowered mothers care more about their children's nutrition.⁽²⁾ Egypt has met its goal of halving, by 2015, the number of people who lack constant access to basic sanitation and safe drinking water, both of which are essential for promoting nutrition.⁽¹⁶⁾ Nevertheless, in Egypt, only 34% of households in rural areas have access to safe sanitation facilities.⁽¹⁶⁾ The GoE has initiated the Descent Life (Haiah Karima) initiative to improve the lives in rural areas across Egypt by providing quality government services to the poorest 1500 villages in phase one. More importantly, 5% of Egyptian households, particularly in the rural Nile Delta, continue to release untreated wastewater into surrounding irrigation canals. This increases the likelihood of contracting waterborne and parasitic diseases.^(16, 34)

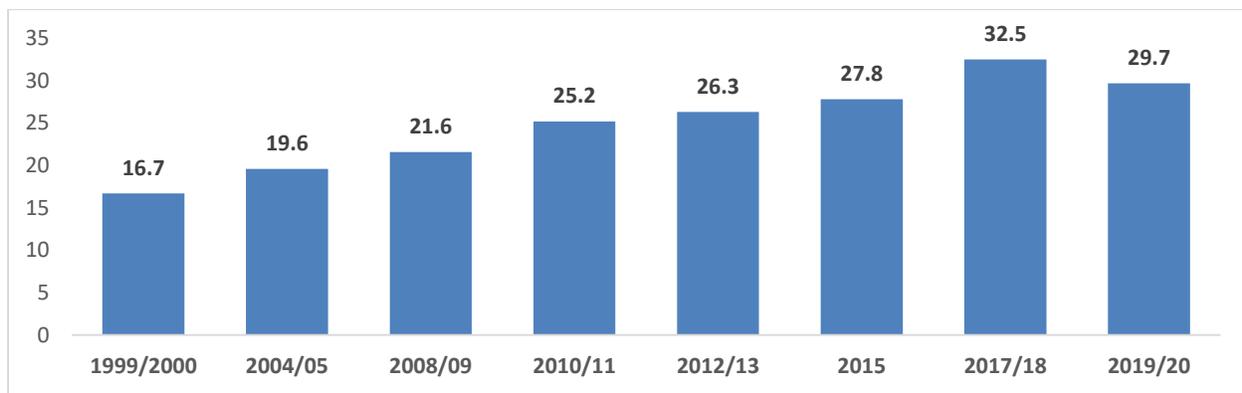


Figure 4: Trends of percent of Egyptians under the national income poverty line from 1999-2018.

National nutrition policy and financing challenges:

In order to address the critical needs and distribution of populations, it is essential to provide an up-to-date account of the Nutrition situation in Egypt, where a detailed description of the problem's magnitude, its causes, and barriers to prevention is necessary. However, we lack key evidence for tackling micronutrient deficiencies in nutritionally vulnerable populations, such as children under five years of age, women, and adolescent girls. We must also revise the national nutrition strategy and its corresponding action plans. Effective governance of nutrition, which will promote nutrition and maintain progress toward nutrition goals, is contingent on strong political commitment, leadership, capacity, and accountability at all levels of government. Egypt's most recent nutrition strategy was the 2007-2017 strategy, but it was not operationalized. In September 2022, the Egyptian Minister of Health announced the completion of the nutrition strategy 2022-2030, which is an excellent plan on the right track. We anticipate having solutions to nutritional problems. The national nutrition strategy requires the inclusion of global nutrition targets in national policies. A further impediment to action is the absence of a clearly specified budget for the nutrition strategy, as only 4–5 percent of the national budget for the years 2012–2020 was allocated to healthcare, leaving the health sector significantly underfunded. In 2012, it was estimated that the government of Egypt spent \$11 million on treating iron, folic acid, and vitamin A deficiencies, compared to the \$18 million spent in 2016. The prevention of poor nutrition outcomes is not part of this estimate because it only focuses on treating nutritional deficiencies.⁽³⁴⁾

Nutritional interventions challenges:

Nutritional interventions in Egypt include two types: nutrition-sensitive interventions, which address the food insecurities arising from low income, unemployment, illness, and old age (It includes food

subsidies (Ration cards and subsidized Baladi bread), Takaful and Karama Programs, as well as school feeding program) and specific interventions that address the immediate determinants (e.g., nutrition supplementation, adequate feeding practices, and food fortification). Nutrition interventions spans across different ministries. There are no formal mechanisms for collaboration between sectors, and there is no specification of the time limit, personal responsibility, method of funding for each task, or monitoring strategy. Consequently, nothing notable or significant was accomplished. Numerous nutrition-related programs in Egypt operate on a small scale, are not systematically linked under a single overarching plan, and frequently have objectives that overlap. Interventions are most effective when delivered as part of an all-encompassing program and directed at the most vulnerable. Moreover, interventions must be scaled up both in **quality and quantity and follow evidence-based recommendations**. For instance, the vitamin A supplementation schedule has been recently increased to 9 doses. Previously it was only supplemented along with the vaccination appointments at 9 and 18 months (this was not following the WHO recommendations of vitamin A supplementation every 6 months for children under 5).⁽⁴¹⁾ According to the EDHS 2014, only one in seven 6–59 months children received vitamin A supplementation. In addition to the routine clinic visits at 36, 48, and 60 months, well-baby clinic visits at 21 and 24 months of age give an extra opportunity to administer additional doses of vitamin A. More countries globally have mandatory fortification, where 86 countries now require at least one type of cereal grain to be fortified with iron and folic acid. Anemia is a critical public health problem in Egypt. The National iron food fortification was discontinued in 2014⁽⁴²⁾ and should be reviewed for the prevention and treatment of anemia and micronutrient deficiencies. Concerning school meal programs in Egypt, supplies are contingent upon the availability of funds, and they should be provided on continuous bases. They should also be nutritious,

diverse, low in sugar-fats-and salt, fortified by iron and vitamins, palatable, and good-looking. In addition, Egypt is currently experiencing **gaps in the coverage, implementations, and evaluations** of many key nutrition interventions, where we have insufficient baseline data, periodic data required to track progress are not readily available (only concentrating on data from demographic surveys), as well as limited infrastructure and technical capabilities for managing and collecting data ⁽⁴³⁾. Strengthening the national nutrition surveillance system is crucial to adequately inform policy formation and resource allocation to achieve the SDGs. Finally, coverage equity may greatly affect the achievement of the SDGs. According to a recent global consultation comprising 15 Low Middle-Income Countries across five regions, the academic and scientific community is not adequately engaged in research efforts to assist in achieving SDGs. ⁽⁴⁴⁾. Investments in implementation research and process evaluations of important programs that provide nutrition interventions will help determine scale-up and best practices to enhance the impact and progress toward SDGs.

Governments are not acting to improve diets, despite the fact that 59 countries impose taxes on sugar-sweetened beverages, many of which are in response to excessive consumption. In Mexico, sugary drink expenditures decreased by 9.7% within two years. Egypt's national food and nutrition policy **lack a tax on sugar-sweetened beverages**, a policy to limit the consumption of saturated fatty acids intake, a policy to eliminate industrially produced trans fats, and policies to reduce the marketing of foods and beverages high in saturated fats, trans fatty acids, free sugar, or salt to children ⁽⁴⁵⁾. Calorie labeling in restaurants menus is an evidence-based regulation that aims to assist individuals in regulating their caloric intake and is implemented in several countries, but not applied in Egypt. ⁽⁴⁶⁾

Health system challenges:

Lack of nutrition-trained health personnel in primary health care settings to enable adequate screening and prevention, the unequal geographical distribution of existing health workers, and gaps due to a lack of resources, supplies, and commodities at health facilities necessitate strengthening the health system in Egypt. According to a MoHP and UNICEF investigation, inputs for programs addressing micronutrient deficiencies, stunting, and obesity were less than 20% available, and certain facilities had restricted access to essential supplies such as iron, folic acid, and vitamin A. ⁽⁴³⁾

CONCLUSION

In conclusion, despite improvements in stunting and wasting among children under 5, Egypt is not on track to meet many global nutrition goals (especially under 5 and school children anemia, exclusive breastfeeding, and overweight and obesity in adolescents and adults). Many of the underlying factors for malnutrition in Egypt are linked to household food insecurity, with increasing the unaffordability of healthy diets among the poorest sections of society as opposed to concerns about food availability, poor eating habits, and access to adequate health services, particularly in poor areas. In Egypt, many gaps (in policy, program, or intervention implementation and evaluation) hinder meeting the SDG goals. Critical steps to accelerate nutrition progress in Egypt, including scale-up the quality and quantity of existing interventions, financing, the delivery of new laws and policies, the prioritization and investment in needed data and the capacity to use it, and the incorporation of best practices into national policies. Policy, government commitment, supplies, and delivery systems, training of service providers, and beneficiaries need to be informed of the benefits of the program, and program monitoring and evaluation all need to be in place and aligned with each other for maximum impact. A multi-system approach focuses on the food, health, water, and sanitation systems, as well as education and social protection systems, to provide nutrition interventions in a coordinated and integrated manner. The food system must support low-cost and nutritionally diverse diets, healthy food environments, and positive food practices. Legislation, labeling, taxes, and marketing regulations are crucial. Finally, research and academia may significantly speed up the achievement of the SDG targets by generating evidence. The review concludes that long-term sustainable development cannot occur unless malnutrition is effectively combated. ⁽⁴⁷⁾

REFERENCES

1. United Nations. The Sustainable Development Goals: 17 Goals to Transform Our World. [sdgs.un.org](https://www.un.org/sustainabledevelopment/). Retrieved 10 Dec 2022.
2. Binns C, Lee MK, Low WY, Zervas A. The Role of Public Health Nutrition in Achieving the Sustainable Development Goals in the Asia Pacific Region. *Asia Pac J Public Health*. 2017 Oct;29(7):617-624. doi: 10.1177/1010539517736441. PMID: 29094630.
3. WHO. Global nutrition targets 2025: policy brief series (WHO/NMH/NHD/14.2). Geneva: World Health Organization; 2014.
4. Horton S and Steckel R. Malnutrition: global economic losses attributable to malnutrition 1900–2000 and projections to 2050. *How Much have Global Problems Cost the World?*, 2014.

5. Black MM, Pé rez-Escamilla R, Rao SF: Integrating nutrition and child development interventions: scientific basis, evidence of impact, and implementation considerations. *Adv Nutr.* 2015; 6:852-9 <http://dx.doi.org/10.3945/an.115.010348> PMID: 26875208; PMCID: PMC4642432.
6. Bhutta ZA, Das JK, Rizvi A, Gaffey MF, Walker N, Horton S, Webb P, et al. Evidence-based interventions for improvement of maternal and child nutrition: what can be done and at what cost? *Lancet.* 2013 Aug 3;382(9890):452-77. doi: 10.1016/S0140-6736(13)60996-4. Epub 2013 Jun 6. Erratum in: *Lancet.* 2013 Aug 3;382(9890):396. PMID: 23746776.
7. Global Nutrition report. 2021 Global Nutrition Report: The state of global nutrition. Bristol, UK: Development Initiatives. Available at: <https://globalnutritionreport.org/reports/2021-global-nutrition-report/>
8. UNICEF, WHO & World Bank. 2021. UNICEF-WHO-World Bank: Joint child malnutrition estimates-Levels and trends (2021 edition) [online]. <https://data.unicef.org/resources/jme-report-2021>
9. Global Health Observatory (GHO). In: WHO [online]. Geneva, Switzerland. [Cited 13 Dec 2022]. www.who.int/data/gho/data/themes/topics/anaemia_in_women_and_children
10. Stevens GA, Bennett JE, Hennocq Q, Lu Y, De-Regil LM, Rogers L, et al. Trends and mortality effects of vitamin A deficiency in children in 138 low-income and middle-income countries between 1991 and 2013: a pooled analysis of population-based surveys. *Lancet Glob Health.* 2015 Sep;3(9):e528-36. doi: 10.1016/S2214-109X(15)00039-X. PMID: 26275329.
11. Global Health Observatory (GHO). In: WHO [online]. Geneva, Switzerland. [Cited 2 Dec 2022]. <https://www.who.int/data/gho/data/themes/topics/indicator-groups/indicator-group-details/GHO/sdg-target-2.2-child-malnutrition>
12. Wessells KR, Brown KH. Estimating the global prevalence of zinc deficiency: results based on zinc availability in national food supplies and the prevalence of stunting. *PLoS One.* 2012;7(11):e50568. doi: 10.1371/journal.pone.0050568. Epub 2012 Nov 29. PMID: 23209782; PMCID: PMC3510072.
13. The Iodine Global Network. Global Scorecard of Iodine Nutrition in 2020 in the General Population Based on School-Age Children (SAC), 2020.
14. FAO, IFAD, UNICEF, WFP and WHO. The State of Food and Nutrition Security Around the World: Repurposing Food and Agricultural Policies to Make Healthy Diets More Affordable. Rome, Italy: FAO, 2022. Available at: <https://www.fao.org/publications/sofi/2022/en/>
15. UN Department of Economic and Social Affairs, Population Division. World Population Prospects. 2019. Available at: <https://population.un.org/wpp/Download/Standard/Population>. Accessed: 23 November 2022.
16. Ministry of Health and Population [Egypt], El-Zanaty and Associates, and ICF International. 2015. Egypt Demographic and Health Survey 2014. Cairo, Egypt and Rockville, Maryland, USA: Ministry of Health and Population and ICF International.
17. Central Agency for Public Mobilization and Statistics. Egypt family health survey 2021. CAPMAS, Egypt 2022
18. Global Health Observatory (GHO). In: WHO [online]. Geneva, Switzerland. [Cited 23 Dec 2022]. <https://www.who.int/data/gho/data/indicators/indicator-details/GHO/infants-exclusively-breastfed-for-the-first-six-months-of-life> (-)
19. Food and Agriculture Organization. Nutrition country profiles: Egypt. FAO, 2003
20. El-Zanaty, Fatma and Ann Way. 2009. Egypt Demographic and Health Survey 2008. Cairo, Egypt: Ministry of Health, El-Zanaty and Associates, and Macro International.
21. Ayoub Al-Jawaldeh and Alexa L. Meyer, Reshaping Food Systems to Improve Nutrition and Health in the Eastern Mediterranean Region. Cambridge, UK: Open Book Publishers, 2023, <https://doi.org/10.11647/OBP.0322>
22. Egypt – ministry of health & population. Food security, nutrition and sustainable. United nation, 2022. Available: https://www.un.org/en/development/desa/population/events/pdf/expert/30/presentations/tuesday/session5/sahar%20el%20onbaty_food%20security%20&%20nutrition.pdf
23. Food and Agriculture Organization. FAOSTAT: Egypt Food Balances (2010-). FAO, 2023. Available at: <https://www.fao.org/faostat/en/#data/FBS> [Cited 31 Jan 2023.]
24. Global Health Observatory (GHO). In: WHO [online]. Geneva, Switzerland. [Cited 13 Dec 2022]. <https://www.who.int/data/gho/data/indicators/indicator-details/GHO/prevalence-of-anaemia-and-overweight-in-children-under-5-years>. (-)
25. UNICEF. Nutrition agenda for action a policy paper on scaling up nutrition interventions in egypt. Cairo, Egypt. UNICEF, 2017. Available at: <https://www.unicef.org/egypt/media/296/file>
26. El-Said Badawi N, Barakat AA, El Sherbini SA, Fawzy HM. Prevalence of overweight and obesity in primary school children in Port Said city. *Egyptian Pediatric Association Gazette.* 2013;61: 31–6. <http://dx.doi.org/10.1016/j.epag.2013.04.007>
27. Taha AA, Marawan HM. Socio-behavioral determinants of overweight and obesity in Egyptian primary school children. *J Child Adolesc Behav.* 2015;3(5): 236, <https://doi.org/10.4172/2375-4494.1000236>
28. Abdelkarim O, Ammar A, Soliman AMA, Hökelmann A. Prevalence of overweight and obesity associated with the levels of physical fitness among primary school age children in Assiut city. *Egyptian Pediatric Association Gazette.* 2017;65(2): 43–8. <https://doi.org/10.1016/j.epag.2017.02.001>
29. Hadhood SESA, Ali RAE, Mohamed MM, Mohammed ES. Prevalence and correlates of overweight and obesity among school children in Sohag, Egypt. *Open Journal of Gastroenterology.* 2017;7: 75–88. doi: 10.4236/ojgas.2017.72009.
30. Abd El-Fatah NK, Abu-Elenin MM. Prevalence of Stunting, Overweight and Obesity among Egyptian Primary School Children in Behera Governorate. *Food and Public Health.* 2019 ;9(3): 84–93. doi:10.5923/j.fph.20190903.02.
31. El-Shafie AM, Kasemy ZA, Omar ZA, Alkalash SH, Salama AA, Mahrous KS, Hewedy SM, Kotb NM, Abd El-Hady HS, Eladawy ES, Zeid MA, Abd El Hamid ME, Hemeda EH, El-Shafie MA, El-Meligy EA, Bahbah WA. Prevalence of short stature and malnutrition among Egyptian primary school children and their coexistence with anemia. *Ital J Pediatr.* 2020 Jun 29;46(1):91. doi: 10.1186/s13052-020-00855-y. PMID: 32600418; PMCID: PMC7325115.
32. El-Zanaty F, Way A. Egypt health issue survey 2015. Cairo: Egyptian Ministry of Health and Population; 2015.
33. World Food Programme. The Status of Poverty and Food Security in Egypt: Analysis and Policy Recommendations. Preliminary Summary Report, Cairo, 2013. <https://documents.wfp.org/stellent/groups/public/documents/ena/wfp257467.pdf>.
34. Herbst, Christopher H., Amr Elshalakani, Jakub Kakiemek, Alia Hafiz, and Oliver Petrovic, eds. Scaling Up Nutrition in the Arab Republic of Egypt: Investing in a Healthy Future. International

- Development in Focus. Washington, DC: World Bank, 2020. doi:10.1596/978-1-4648-1467-9 License: Creative Commons Attribution CC BY 3.0 IGO
35. Global Health Observatory (GHO). In: WHO [online]. Geneva, Switzerland. [Cited 13 Dec 2022]. <https://www.who.int/data/gho/data/indicators/indicator-details/GHO/prevalence-of-anaemia-in-women-of-reproductive-age>. (-)
 36. Food and Agriculture Organization. FAOSTAT: Hunger and food insecurity, 2023. Available at: <https://www.fao.org/faostat/en/#country/59>. [Cited 28 Jan 2023.]
 37. CAPMAS, Indicators derived from HIECS 2017/18, https://www.capmas.gov.eg/Pages/StaticPages.aspx?page_id=7183
 38. Armanious D. Accelerating global actions for a world without poverty: Egypt experiences. United Nations Report, 2020. https://www.un.org/development/desa/dspd/wp-content/uploads/sites/22/2021/02/Final-World-without-poverty-Egypt_31-january-2021.pdf
 39. UNESCO Institute for Statistics, 2020. Available at: <https://data.worldbank.org/indicator/SE.SEC.NENR.FE?locations=EG>
 40. UN Development Programme. Human Development Report. Gender Inequality Index. Available at: <http://hdr.undp.org/en/indicators/68606#>.
 41. WHO. Guideline: Vitamin A supplementation in infants and children 6–59 months of age. Geneva, World Health Organization, 2011. Available at: <https://www.who.int/publications/i/item/9789241501767>
 42. World Health Organization. Regional Office for the Eastern Mediterranean, Ayoub Al Jawaldeh, Juan Pablo Pena-Rosas, Karen McColl, Quentin Johnson. et al. Wheat flour fortification in the Eastern Mediterranean Region. World Health Organization, Cairo: Regional Office for the Eastern Mediterranean; 2019. License: CC BY-NC-SA 3.0 IGO. <https://apps.who.int/iris/handle/10665/311730>.
 43. Ministry of Health and Population. Egypt Nutrition Landscape Analysis Report 2012. Government of Egypt, Cairo, 2012.
 44. Siddiqi S, Aftab W, Siddiqui FJ, Huicho L, Mogilevskii R, Friberg P, et al. Global strategies and local implementation of health and health-related SDGs: lessons from consultation in countries across five regions. *BMJ Global Health* 2020;5:e002859.
 45. Global nutrition report. Country Nutrition Profiles: Egypt 2021. Bristol, UK: Development Initiatives. Available at: <https://globalnutritionreport.org/resources/nutrition-profiles/africa/northern-africa/egypt/>
 46. Bleich SN, Economos CD, Spiker ML, Vercammen KA, VanEpps EM, Block JP, et al. A Systematic Review of Calorie Labeling and Modified Calorie Labeling Interventions: Impact on Consumer and Restaurant Behavior. *Obesity* (Silver Spring). 2017 Dec;25(12):2018-2044. doi: 10.1002/oby.21940. Epub 2017 Oct 17. PMID: 29045080; PMCID: PMC5752125.
 47. Lopez de Romaña D, Greig A, Thompson A, Arabi M. Successful delivery of nutrition programs and the sustainable development goals. *Curr Opin Biotechnol*. 2021 Aug;70:97-107. doi: 10.1016/j.copbio.2021.03.004. Epub 2021 Mar 31. PMID: 33812278