

The Multiple Burdens of Malnutrition

Food system drivers and solutions

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Key messages

- > Although undernutrition persists in many low- and middle-income countries, rates of overweight and obesity are on the rise, particularly among women.
- > Nearly all countries in the world now experience at least one form of malnutrition.
- > Undernutrition and overweight/obesity can no longer be tackled independently of one another.
- > Many countries of the developing world are experiencing a nutrition transition characterized by an increase in the consumption of energy-dense foods of low nutritional quality as well as high intakes of refined carbohydrates, added sugars and fats.
- > The creation of a healthier food environment could lead to increased consumption of nutrient-rich foods while reducing consumption of energy-dense foods of low nutritional value.
- > To make nutrient-rich foods more available, affordable and acceptable within the current food environment, changes are needed across the full breadth of the food system.

Multiple burdens of malnutrition

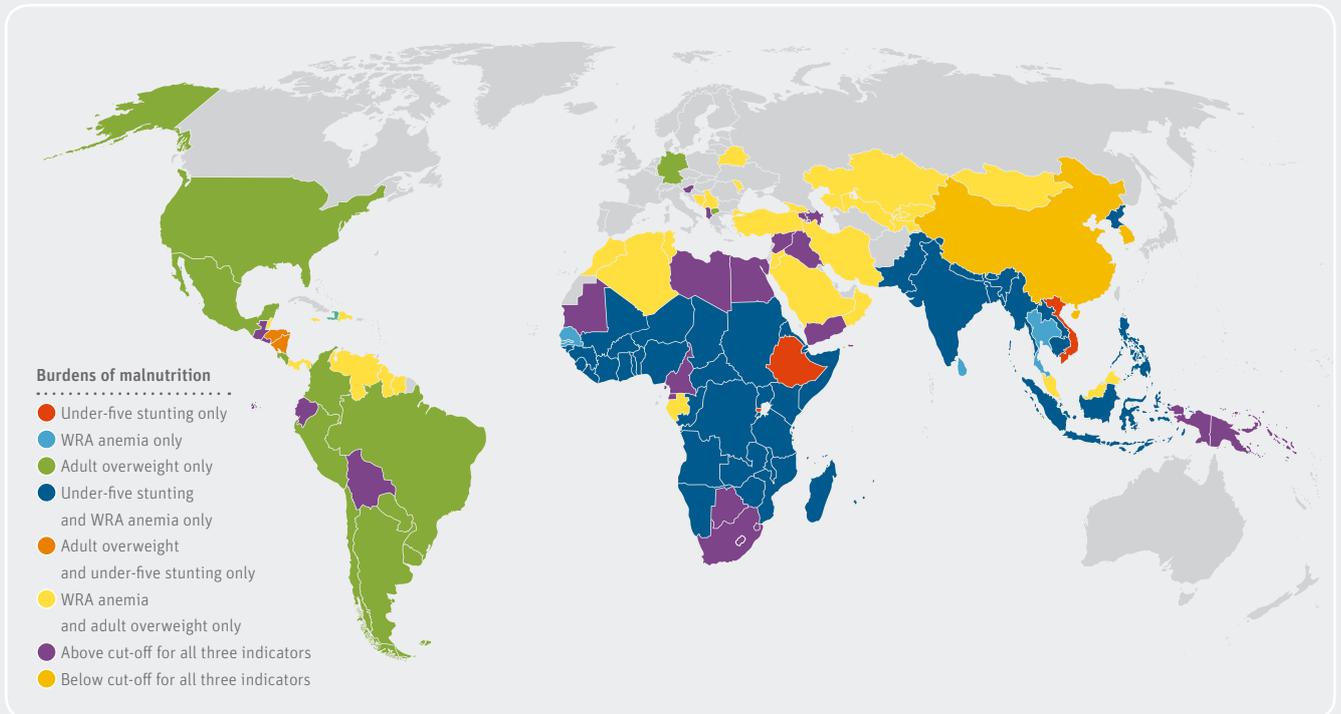
Overweight and obesity, and their associated diet-related non-communicable diseases (NCDs) including cardiovascular disease and diabetes, are no longer a problem exclusive to the developed world.¹ In the past, the main burden of nutrition-related

disease in the developing world was undernutrition – stunting, underweight, wasting, and micronutrient deficiencies. However, in recent decades there has been a shift in the burden of malnutrition.¹ Although undernutrition continues to persist in many low- and middle-income countries,^{2,3} rates of overweight and obesity are on the rise, particularly among women.⁴ Between 1975 and 2014, the global prevalence of underweight in women decreased from 14.6% to 9.7%, whereas the obesity prevalence increased from 6.4% to 14.9% over the same period – and the same pattern was found in men.¹ Alongside these increases in overweight and obesity, there have been marked increases in the global prevalence of diabetes and cardiovascular disease.^{5,6} The global prevalence of diabetes increased among women from 5% in 1974 to 7.9% in 2014; an appalling 422 million people worldwide now have diabetes.¹

“An appalling 422 million people worldwide now have diabetes”

Nearly all countries in the world now experience at least one form of malnutrition. Of the 122 countries examined in the 2014 Global Nutrition Report, all but two experienced high rates of at least one form of malnutrition (**Figure 1**).⁷ Nearly half (45%) experienced at least one form of undernutrition ($\geq 20\%$ under-five stunting and/or anemia in women of reproductive age) in combination with high levels of overweight in adults ($\geq 35\%$).⁷ In addition to the multiple burdens of malnutrition within the same country, the phenomenon has also been observed within the same household. A study conducted in urban Kenya found a large proportion of mothers who were overweight (43%) or obese (37%) had stunted children.⁸ This is not unique to Kenya. Multiple burdens of malnutrition within the same household have been observed in other countries worldwide.^{9–13}

It is clear that undernutrition and overweight/obesity can no longer be tackled independently of one another. Given that one of the drivers of all forms of malnutrition is the food we consume (or do not consume), addressing the way in which the food

FIGURE 1: Burdens of malnutrition

Source: Adapted from the 2014 Global Nutrition Report⁷

WRA = women of reproductive age

Cut-offs for placing countries in each indicator were: under-five stunting $\geq 20\%$, WRA $\geq 20\%$ and adult overweight $\geq 35\%$

Island states not included on map: Comoros (<5 stunting & WRA anemia); Saint Lucia (WRA anemia and adult overweight); Maldives, Sao Tome and Principe, Solomon Islands, Vanuatu (<5 stunting, WRA anemia and adult overweight)

system delivers the nutrition that is needed to promote health both in the context of undernutrition and overweight and obesity is imperative.

Food systems in the developing world are changing

The global food system is rapidly changing. As it has become more globalized, this has led to shifts in the availability, affordability and acceptability of food.^{14,15} A nutrition transition has coincided with these changes in many countries in the developing world. This has been associated with an increase in the consumption of energy-dense foods of low nutritional quality as well as a high intake of refined carbohydrates, added sugars and fats, along with animal-source foods.¹⁶

There are several drivers of the nutrition transition and the changes in food environments worldwide. Globalization and trade liberalization have led to an influx of highly processed foods (e.g., soft drinks, fast foods and baked goods) and an expansion of transnational food companies, making these foods more widely available and affordable.^{15,17} Moreover, companies have marketed these foods intensely in order to generate increased consumer demand.^{18,19} In some cases, smaller portion sizes and

packaging have been used to enable low-income consumers to purchase these products at a low price.²⁰ This has removed the price barrier, increasing access to these energy-dense foods of low nutritional value among the world's poor. At the same time, street foods and locally produced and prepared fried snacks and sweets are widely available.^{21,22} These changes, combined with changes in physical activity patterns and an increase in sedentary behaviors, have led to the increased burden of overweight and obesity.²³

“Street foods and locally produced and prepared fried snacks and sweets are widely available”

Tackling the multiple burdens of malnutrition together

In order to tackle the multiple burdens of malnutrition, individual, community and broader food system changes are needed. At the individual level, addressing eating and feeding patterns in the first 1,000 days from conception until the child is

two years of age (including exclusive breastfeeding) can help reduce the risk of both undernutrition and overweight/obesity.³ Providing nutritious food at the community level through school meals or food assistance can also help. However, in order to ensure that these interventions are feasible, the food system needs to be better equipped to deliver nutrient-rich foods at an affordable price, particularly for the most vulnerable populations. Addressing the set of underlying incentives and disincentives in the food system that make it difficult for people who are socioeconomically disadvantaged to access nutrient-rich foods will be necessary. Outlined below are examples of where to intervene at the individual, community and broader food-system level to address the underlying drivers of the multiple burdens of malnutrition.

The first 1,000 days

The first 1,000 days from conception to two years is a critical period for disease risk later in life: what women eat (or do not eat) during this period has lasting and irreversible consequences for their offspring.²⁴ Insufficient nutritional intake during pregnancy triggers anatomical, hormonal and physiological changes in the fetus that enhance its survival in “resource-poor” environments.²⁵ However, when these nutritional deficits are followed by periods of “excess,” this can lead to the development of disease.²⁵ The developmental-origins hypothesis posits that the long-term risk of disease is initially induced through adaptive responses that the fetus or infant makes to cues from the mother about her state of health.²⁶ Both over- and under-eating during pregnancy can lead to accelerated weight gain in childhood and increase the offspring’s risk of NCDs later in life.²⁶ Evidence to support this hypothesis is growing, and has been identified in birth cohorts from Brazil, Guatemala, India, the Philippines and South Africa.²⁷ Although this can be viewed as a challenge to tackling the multiple burdens of malnutrition, it is also an opportunity for early prevention.

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The 2013 Lancet Series on Maternal and Child Nutrition outlines interventions aimed at improving nutrition during this critical period. If delivered at scale, these interventions have the potential to help address part of the malnutrition burden worldwide. For example, exclusive breastfeeding until the infant is six months of age promotes optimal growth and development²⁸

while at the same time reducing the odds of type 2 diabetes and overweight/obesity in children.^{29,30}

School meals

Providing healthy foods in schools in all countries worldwide is vital for improving school attendance and retention, particularly among girls, improving nutritional status and cognitive development, and combating overweight/obesity; schools are an important social safety net for low-income populations.³¹ Providing nutrient-rich foods to schoolchildren ensures that even the poorest of children have at least one healthy meal throughout the day. This is important in both a developing- and developed-world context. However, for school meals to deliver for both undernutrition and overweight/obesity prevention, they need to include fresh, minimally processed, nutrient-rich foods. Developing clear guidelines and policies for school meals could help ensure that meals meet the nutritional needs of schoolchildren. However, these guidelines need to reflect the current state of the evidence in terms of what constitutes nutritious foods – something which does not always happen at present. For example, in an effort to reduce fat consumption, the United States National School Lunch Program bans full-fat milk but allows the sugar-sweetened low-fat chocolate variety.^{32,33} The World Health Organization’s Nutrition Friendly School Initiative is a school-based program aimed at preventing the double burden of malnutrition.³⁴ One of the components of that initiative is the development of school nutrition policies. A pilot study of the initiative conducted in Benin and Burkina Faso suggested that it had the potential to mobilize schools and communities for improved nutrition and health, but the approach would need to be adapted for local conditions with limited human and material resources in order to ensure its success.³⁵

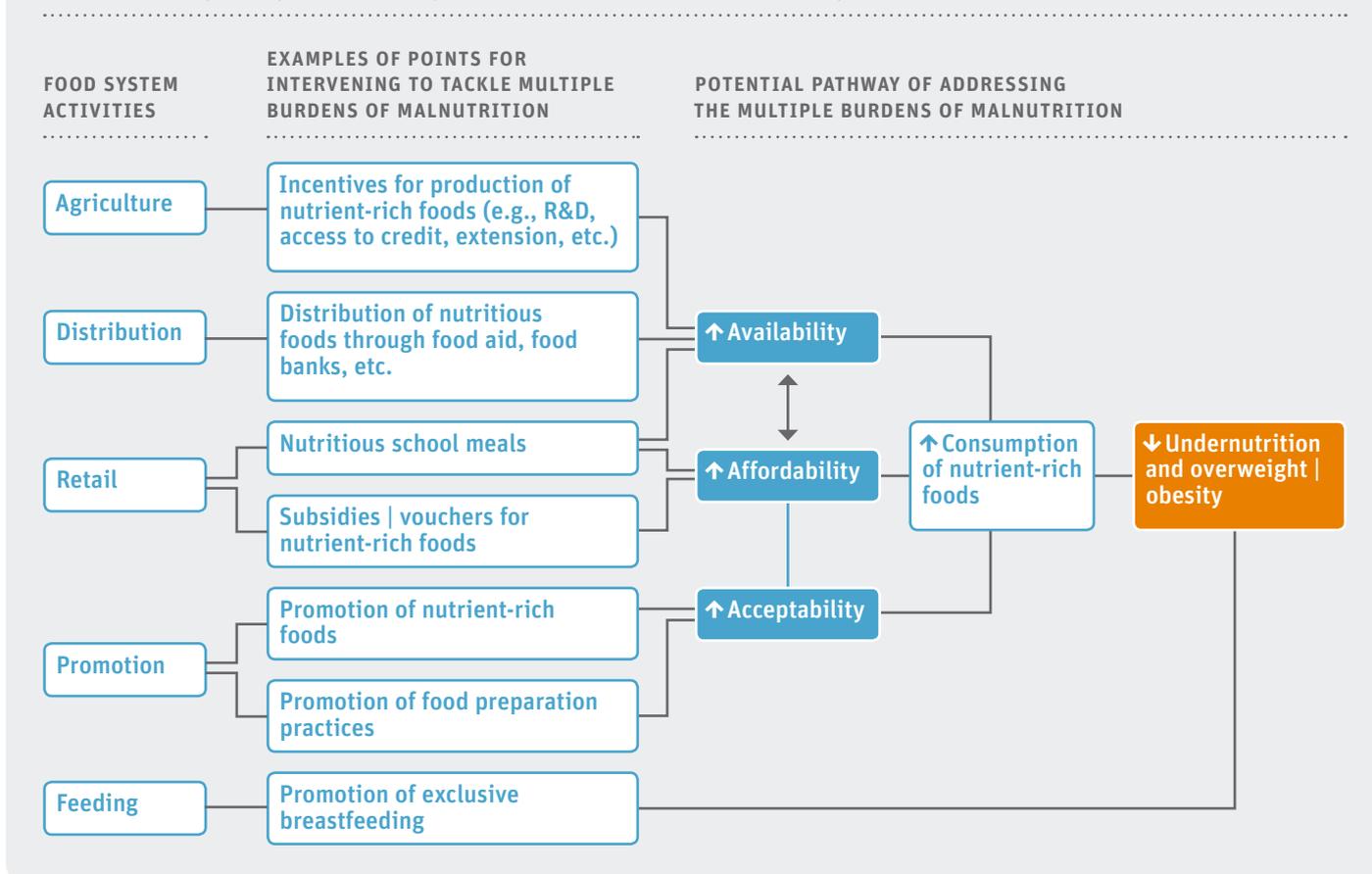
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Food assistance

The multiple burdens of malnutrition can exist even in the direst of circumstances. A study examining the multiple burdens of malnutrition among refugee populations in Western Sahara refugee camps in Algeria found the coexistence of undernutrition and overweight/obesity in 24.7% of households.⁹ High levels of the coexistence of multiple burdens of malnutrition have also been found in the Gaza Strip.¹¹ Food assistance, cash transfers

FIGURE 2: Examples of potential food system interventions to address the multiple burdens of malnutrition

and vouchers, particularly in areas of prolonged conflict, need to deliver both in terms of energy/nutrient needs and in terms of broader food quality. Ensuring that high-quality, minimally processed foods are also available and affordable could help stave off overweight/obesity in these situations. For example, a World Food Programme (WFP) initiative in Gaza aims to address the double burden by providing vouchers that can be used to purchase fresh, nutritious produce in combination with a nutrition awareness pilot program.³⁶ The program provides interactive discussions and presentations on diet, hygiene, cooking, purchasing healthy food on a budget, and care of infants for women receiving WFP vouchers who are pregnant or have small children.³⁶

Creating a supportive food system

A healthier food environment (i.e., the multitude of factors that affect food access) could lead to increased consumption of nutrient-rich foods while reducing consumption of energy-dense foods of low nutritional value. However, in order to make nutrient-rich foods more available, affordable and acceptable within the current food environment, changes are needed across the full breadth of the food system. These need to take place all along the value chain, from agricultural production all the way through to consumption.

Food system incentives that favor the production of cereals and cash crops over fruits, vegetables, nuts and legumes are one of the main underlying reasons that highly processed foods (e.g., sugar-sweetened beverages, biscuits and chips) have become so cheap and widely available worldwide. For example, incentives (i.e., subsidies, research & development, and crop insurance) for the production of corn and soybean oil in the United States have distorted the price of the “ingredients” of many highly processed foods. Palm oil, which is high in saturated fat, has become the most consumed oil on the planet after investment in its production by Malaysia and Indonesia, as well as support from the World Bank.³⁷ Half of all packaged food products now contain palm oil.³⁸ This may have implications for health (although additional evidence is needed)^{32,39} as well as for the environment, given that the promotion of palm oil production has led to substantial deforestation and loss of biodiversity.⁴⁰ In order to ensure better access to healthy foods (produced in a sustainable way), and in an effort to avert the multiple burdens of malnutrition, food system incentives must be realigned to support a healthier food environment, thus making it easier for individuals to make healthier choices. **Figure 2** provides examples of potential points at which to intervene in the food system to address the multiple burdens of malnutrition by improving the availabil-

ity, affordability and acceptability of nutritious foods. These examples would tackle both undernutrition and overweight/obesity simultaneously. However, as the overweight/obesity rates continue to increase worldwide, additional policy approaches such as taxation and improved labeling will be needed.^{41,42}

Avoiding unintended consequences

In order to make progress toward addressing the multiple burdens of malnutrition, interventions need to ensure that efforts to address undernutrition do not have negative consequences for overweight/obesity. For example, Mexico's Progres-a-Oportunidades conditional cash transfer program was successful in addressing undernutrition among socioeconomically disadvantaged Mexicans. However, the program was associated with an increased body mass index (BMI), higher diastolic blood pressure, and higher prevalence of overweight and obesity in participants.⁴³ Another potential intervention aimed at tackling undernutrition that has the potential for negative unintended consequences for overweight/obesity and diet-related NCDs is the fortification of some staple foods. Although these initiatives are important for delivering key micronutrients to populations at risk of deficiency, in some cases, the vehicles for fortification could be problematic if consumed in excess. For example, consuming fortified processed foods and condiments such as fortified sugar, salt and high-sodium sauces (e.g., soy and fish sauce) will likely improve micronutrient intakes,⁴⁴ but could have negative repercussions for overweight/obesity and diet-related NCDs if consumed in excess. These potential unintended consequences need to be acknowledged and addressed prior to program implementation. Supplementary feeding programs need to be constantly evaluated and grounded in the needs of the targeted population to ensure that there are no negative repercussions in terms of obesity risk.⁴⁵

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Conclusions

Most countries worldwide are now battling multiple burdens of malnutrition. In order to make progress in tackling the multiple burdens, interventions throughout the food system to ensure that nutritious foods are available, affordable and acceptable for all populations worldwide will be needed. A joined-up approach to tackling all forms of malnutrition is essential.

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