## Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preface</td>
<td>2</td>
</tr>
<tr>
<td><strong>The burden of obesity</strong></td>
<td>3</td>
</tr>
<tr>
<td>Problems of obesity</td>
<td>4</td>
</tr>
<tr>
<td>Is there a relationship between obesity and food security?</td>
<td>4</td>
</tr>
<tr>
<td>What is the body mass index?</td>
<td>5</td>
</tr>
<tr>
<td>Co-existence does not mean related</td>
<td>6</td>
</tr>
<tr>
<td>So what, then, is the connection?</td>
<td>7</td>
</tr>
<tr>
<td>Different relationships in developing countries</td>
<td>9</td>
</tr>
<tr>
<td>Interaction with the GFSI</td>
<td>10</td>
</tr>
<tr>
<td>Solutions and limitations</td>
<td>10</td>
</tr>
<tr>
<td>Measuring obesity in the GFSI</td>
<td>11</td>
</tr>
<tr>
<td>Conclusion</td>
<td>13</td>
</tr>
</tbody>
</table>
The burden of obesity: Its relationship with food security is a special report that coincides with the third edition of the Global Food Security Index (GFSI), an Economist Intelligence Unit (EIU) study commissioned by DuPont. This report discusses the growing prevalence of obesity and its relationship with food security.

Lucy Hurst, associate director of custom research for the Americas, was the research director for this project. Joshua Grundleger, analyst, was the project manager for the project and editor of this special report. Katherine Stewart, research associate, provided editorial and research support. Leo Abruzzese, global forecasting director and global director of public policy, served as senior adviser. Lolli Duvivier provided editorial support. Mike Kenny was responsible for layout and design. Madeline Baron and Carol Rose Little served as editorial assistants.
SPECIAL REPORT:

The burden of obesity
Its relationship with food security

- Obesity and food security can co-exist, but their relationship is complicated, with poverty and other factors potentially impacting both. The prevalence of obesity is moderately correlated with overall GFSI scores, reflecting the complex relationship between both issues at the national level.

- In developing countries obesity tends to be a bigger issue for the more food secure, who are generally wealthier and have adopted middle-class, urban and Westernised lifestyles. Food insecurity, however, remains a problem for many of the poor in these countries.

- The prevalence of obesity is increasing in developed countries, particularly among the poor, and while its interaction with food security is currently ill-defined, access to affordable and nutritious food is important.

Food security is a broad and multifaceted issue that is interconnected with many economic, social, political and health-related concerns. In recent years, the growing public focus on obesity has spurred considerable discussion on its relationship with food security. The relationship, like many issues connected with food security, is complex, and while policy is already being implemented, many questions remain.

Obesity contributes to the death of nearly 3m individuals every year and creates considerable woes for millions of others.\(^1\) Although obesity is predominantly a developed-world phenomenon, it is increasingly evident in all but the poorest economies. In developing countries such as Syria, Mexico and Jordan nearly one-third of the population is obese, a statistic in line with that of the United States.

Unfortunately, the prevalence of obesity appears to be increasing. Worldwide, obesity levels have nearly doubled over the past 30 years, with almost half a billion individuals obese in 2008, although there has been evidence of a reversing trend in some geographies.\(^2\) Over the past decade, for example, obesity rates have declined by 43% among young children in the US.\(^3\)

Nevertheless, the topic of obesity and, in particular, its relationship with food security, has received considerable attention in recent years, both within the media and among key stakeholders. Whereas obesity was once studied independently of food security, today many scholars and policymakers are attempting to discern potential linkages between the two issues.

Over the past three years The Economist Intelligence Unit (EIU) has developed a programme surrounding the Global Food Security Index (GFSI)—an annual index sponsored by DuPont—to further the dialogue on food security. This special report on obesity explores the potential relationship between food security and obesity, tracing global trends and highlighting some possible interactions between the two issues. Its aim is to provide a starting point for individuals, policymakers, private-sector leaders and other stakeholders to expand their insight and, hopefully, learn how to address both of these issues.

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1 “Ensuring food and nutrition security”, World Economic and Social Survey 2013: Sustainable Development Challenges, United Nations, 2013.
Problems of obesity

Obesity is a condition that often has a pernicious impact on both the physical and the mental health of millions of individuals. It is frequently related to, and may cause, a wide array of health problems, including diabetes, hypertension, cardiovascular disease, musculoskeletal disorders, sleep problems and even some cancers, such as breast and colon cancer. It can also contribute to poor mental health through eating disorders and depressive disorders. Additionally, obesity can be expensive, requiring greater healthcare expenditure to successfully manage the effects of the condition and even limiting an individual’s productivity and ability to work.

On a basic level, obesity is the product of an energy imbalance, where more calories are consumed than used by the body. Reduced caloric intake or increased activity—or some combination of the two—should theoretically address the problem. However, with genetic, biological and other factors also at work, obesity is indisputably a more complex problem.

Consequently, obesity does not simply imply that an individual is overfed. Micronutrient deficiencies—including of iron and vitamin A—may exist alongside obesity, a product of consuming excess food that lacks the appropriate nutrients. Accordingly, an individual may be both obese and malnourished. This issue contributes to a very complex problem that simple solutions, such as reducing the consumption of food or increasing physical activity, rarely solve.

Is there a relationship between obesity and food security?

While the challenges of obesity are readily apparent, its relationship with food security—which in the GFSI is defined as “the state in which people at all times have physical, social and economic access to sufficient and nutritious food that meets their dietary needs for a healthy and active life”—is considerably nuanced.

Historically, the public policy approach to addressing food insecurity emphasised improving the affordability and availability of food. The focus, particularly in impoverished and developing countries, was on hunger. Many instances of food

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<tr>
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</tr>
</thead>
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<td>Ethiopia</td>
</tr>
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<tr>
<td>Egypt</td>
<td>Nepal</td>
</tr>
<tr>
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</tr>
<tr>
<td>Jordan</td>
<td>Vietnam</td>
</tr>
<tr>
<td>34</td>
<td>2</td>
</tr>
<tr>
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<td>Madagascar</td>
</tr>
<tr>
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<td>2</td>
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<tr>
<td>South Africa</td>
<td>India</td>
</tr>
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<td>2</td>
</tr>
<tr>
<td>Mexico</td>
<td>Cambodia</td>
</tr>
<tr>
<td>33</td>
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<tr>
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<td>Burkina Faso</td>
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<tr>
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Source: World Health Organisation

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4 “Obesity and overweight”, World Health Organisation, March 2013
insecurity constituted cases where individuals or communities simply did not have sufficient food. In extreme cases, images of starving children came to define this perspective.

However, in recent years there has been an increasing focus on an expanded understanding of food security. In particular, research has begun exploring the relationship between obesity and food security, with some arguing that obesity is a direct result of food insecurity. While there has been much independent discussion about both issues, the extent of their relationship has yet to be determined. Evidence has been presented that both supports and refutes the existence of a relationship between the two factors.

One difficulty in understanding the relationship is a level-of-analysis problem. At its heart, obesity is an individual problem and can be influenced by many factors, including diet, level of activity, income level, access to food, genetics, lifestyle choices and culture.\(^9\) By contrast, particularly as addressed in the GFSI, food security is a national problem that is concerned with structural issues, such as corruption, infrastructure and food supply. This creates difficulties in tracking how broad, structural issues impact individual problems. Other difficulties involve measurement and

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2. Craig Gundersen, Steven Garasky and Brenda J. Lohman, “Food Insecurity is Not Associated with Childhood Obesity as Assessed Using Multiple Measures of Obesity”, *The Journal of Nutrition*, June 2009, 139(6), 1173-1178.

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definition problems. Collecting information on both food security and obesity can be challenging (see the box on BMI), and researchers have struggled to quantify complex concepts in manageable but appropriate ways. The concept of food security, for example, is multifaceted and interconnected with other issues, such as poverty, which can yield complications when trying to discern relationships. Marlene Schwartz, the director of the Yale Rudd Center for Food Policy & Obesity, argues: “What is complicated about doing research in this area is that... obesity is caused by so many things. The multitude of factors that affect obesity make studies really hard to conduct.”10

Co-existence does not mean related

One thing, at least, is clear: obesity and food insecurity can co-exist. Both problems can be readily found within the same countries and communities, and there is evidence that they can co-exist in the same household and maybe even in the same individual. However, co-existence need not mean the two issues are directly, or even indirectly, connected. According to Dr Schwartz, “there is definitely overlap [between obesity and food security]... particularly in the US...but when we start talking about causal relationships there is a lot of disagreement”.11

In the developed world, there is an ongoing debate about the relationship between the two factors. Most studies show that there is no relationship between the two issues for children, although some show the opposite result.12 Similarly, for adolescents most studies have shown only a slight or inverse relationship, while a few studies have provided support for a positive relationship for adolescents in the presence of maternal stressors or under certain conditions for adolescent women. For adult males, no relationships or inverse relationships have been demonstrated in nearly all studies. The most robust data in support of a strong relationship have been for adult females, where some evidence has shown a greater likelihood of being obese if one is food insecure.13 Such a relationship has been found for women in parts of the US, Europe and Australia.14 The results become even more varied when socioeconomic or ethnic sub-groups are considered.15

Although considerably less research has been conducted in developing countries, there has been as much ambiguity about the relationship between obesity and food security as in developed countries. A recent study has shown substantial complexity in rural Malaysia,16 while in Ghana17 and Trinidad and Tobago18 two separate studies have shown that greater food insecurity is correlated with underweight, not obesity. Likewise, an analysis done on adults and children in Bogota, Colombia indicates that food insecurity predicts underweight.19 On the other hand, an association existed between obesity and severe food insecurity for women in Tehran, Iran, but there was no evidence of a causal relationship.20 In Uganda a study found that food-insecure females (but not males) were significantly more likely to be overweight; however, this effect disappeared when controlling for certain environmental factors.21

10 Interview with Marlene B. Schwartz, director, and Tatiana Andrejeva, director of economic initiatives at the Yale Rudd Center for Food Policy & Obesity.
11 Ibid.
So what, then, is the connection?

Despite the opacity of whether there is a direct relationship between obesity and food security, much thought has been given to what an association may look like. The relationship, if it exists, is still unclear and could range from a simple linear one to a more complex one (for example U-shaped, where obesity is positively correlated with moderate, but not severe, food insecurity). Food security and obesity may both be influenced by tertiary drivers, such as poverty, or affect each other through mitigating factors. Additionally, the direction of causation — whether obesity causes food security or vice-versa — is still an open question.

Regardless, a number of theories have been offered to explain a potential relationship. The most basic explanations examine access to nutritious and quality food. Such arguments hold that the most food insecure, who are often the poorest, do not have sufficient access to quality food. Particularly in developed countries, such arguments posit, there is a dearth of healthy food available for the poorest. Grocery stores with fresh fruits and vegetables are rare in these communities, and high-calorie but low-nutrient food is cheaper. The prevalence of fast-food restaurants is also frequently cited as a deterrent to healthy eating. This environment may lead to dependence on energy-dense food products, which do not provide sufficient nutrition and ultimately lead to obesity.

An analogous argument is made with regard to access to opportunities for physical activities. Such swings between binging and restriction can lead to changes in an individual’s metabolism that can yield increased accumulation of fat.

While there has been some evidence of this relationship in the US, such dynamics have not been found in other countries, such as the UK and Australia. A controlled study conducted in Scotland found that dietary choices did not change when access to quality food improved. Such arguments are also often unsubstantiated in the poorest countries, which do not have similar markets for groceries.

Another theory explores what is known as the feast-famine cycle, where food-insecure individuals and households oscillate between times of a relative dearth of food and ones of increased supply and excessive consumption. Such swings between bingeing and restriction can lead to increases in a person’s metabolism that can yield increased accumulation of fat.

A third explanation — the sacrifice theory — attempts to elucidate the seemingly contradictory existence of obesity and underweight or normal body weight within a single household, by exploring the distribution of food. In particular, the sacrifice theory holds that adults, especially mothers, are more likely to give available healthy food to their children, reserving the cheaper and less nutritious food for themselves. By sacrificing for their children, they increase their own likelihood of

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26. Ibid.
obesity, while minimising it in the youngest.29 Likewise, public feeding programmes, such as the Supplemental Nutrition Assistance Program (SNAP, formerly known as the Food Stamp Program) in the US, may be a contributing factor in driving obesity among the food insecure. Considerable research has been conducted—with mixed results—exploring the implications of these programmes on obesity.30 Research in this space posits a number of pathways for this relationship, including the food stamp cycle (analogous to famine-feast cycle, but driven directly by periodic payment of benefits); psychological effects of long-term poverty, including stress; income effects, where food benefits yield greater expenditure on food than would otherwise occur; and greater consumption of energy-dense foods instead of nutritious food, as discussed above.

Food insecurity may also impact obesity over the duration of individuals’ lives—even if such insecurity was only experienced at a finite point. If an infant, or foetus, experiences severe malnutrition during crucial stages of its development, it may be more prone to developing obesity, among other chronic conditions, later in life.31 Early deprivation may create a long-term relationship between food insecurity and obesity. Regrettably, such inter-temporal dynamics have not been considered by most studies, which generally only explore simultaneous instances of food insecurity and obesity.

While these explanations attempt to directly link food security and obesity, other factors may also be driving higher levels of obesity. Genetics and biology undoubtedly play an important role in determining an individual’s likelihood of obesity. Likewise, poor personal choices are a key factor that muddies the relationship between obesity and food security. Culture and lifestyle—potentially determined by an individual’s class, ethnicity, religion or socioeconomic background—might change priorities, goals and values in a manner that leads to more (or less) obesity.


33 Sonia Caprio, Stephen R. Daniels, Adam Drewnowski, Francine R. Kaufman, Craig Gundersen, professor of agricultural strategy at the University of Illinois at Urbana-Champaign, states that “in a lot of developing countries, being overweight is considered a good thing. It shows you have wealth.”33 If these cultural characteristics are correlated with communities that experience greater food insecurity, it may lead to the identification of spurious relationships between obesity and food insecurity.

Additionally, tertiary factors may be simultaneously driving both obesity and food insecurity. This would imply that the two factors are only indirectly related. The most commonly cited example is poverty.35 As one study emphasised: “Obesity and poverty are associated, and food insecurity and poverty often coexist.”36 Likewise, stress has been offered as a mechanism that may drive obesity.37 Such arguments hold that food insecurity causes stress, which in turn causes obesity. However, stress can come from many
sources and contribute to both obesity and food insecurity. If poverty or stress simultaneously drive obesity and food insecurity, any relationship between the latter two may be irrelevant.

Finally, the question of direction of causality remains. Much of the literature assumes that food insecurity causes obesity. Nevertheless it is possible that the causality is reversed, that obesity causes food insecurity. In fact, the causality might simultaneously go in both directions—food insecurity can be a risk factor for obesity, while obesity is also a risk factor for food insecurity. Obesity may cause food insecurity through a number of avenues, for instance, by reducing household productivity (through depression or chronic diseases that inhibit the ability to work, for example) and thus income, restricting mobility and thus access to food, or by increasing the need for greater quantities of food, which may prove problematic within the constraints of limited budgets. Unfortunately, very little research has been conducted on this question, and clearer insight is necessary in order to fully understand both of these issues.

Different relationships in developing countries

While many of these potential relationships apply to both developing and developed countries, there are a number of key differences in how obesity relates to food insecurity across the globe. One of the starkest differences between developed and developing countries is that obesity is more prevalent among the poorest individuals in developed countries and among the richest in developing countries. According to one recent article, “[t]he evidence is that in low-income countries, obesity is associated with affluence, but in high-income countries, obesity is more often associated with lower socioeconomic status...”.

Consequently, in developing countries the presence of food insecurity and obesity might be due to subnational factors—different people within the same countries are experiencing different phenomena. Those in the highest income levels may be solely grappling with obesity, while food insecurity still remains the predominant problem for the poorest.

This would mitigate the complexities discussed above. If such a dynamic is proven correct, more traditional explanations for the growing prevalence of obesity may suffice. Increasing wealth and incomes, urbanisation, greater access to supermarkets, declining food prices and changing diets may contribute to increased obesity. Eric Finkelstein of the Global Health Institute at Duke University, has posited that economic growth has contributed to the increasing prevalence of obesity across the globe. In particular, as individuals in developing countries transition into the middle class, they often exchange traditional foods for more Westernised diets. This frequently signifies a shift from a vegetable and grain-heavy diet, which is often prepared within the home, to diets that include more animal products, fats and oils. Consumption patterns also change when working women have less preparation time for meals and substitute convenience foods instead. Other changes in lifestyle that can accompany Westernisation and urbanisation, such as reduced activity levels owing to greater mechanisation of life, may also have played a role in the dramatic increase in per capita

40 Interview with Stacey Rosen, USDA Economic Research Service podcast.
41 Ibid.
42 Ibid.
43 Interview with Eric A. Finkelstein, Duke University.
44 Ibid.
46 Ibid.
calorie consumption in the developing world.\footnote{Ibid.} \footnote{Stacey Rosen and Shahla Shapouri, “Obesity in the Midst of Unyielding Food Insecurity in Developing Countries”, Amber Waves, USDA Economic Research Service, September 1st 2008.}

Additionally, some studies have suggested that biology in developing countries is an important factor in driving higher obesity rates. First, “populations of developing countries have on average a genetic predisposition towards developing obesity”. Second, rapid transition from hunger and undernourishment to an environment of relative abundance can yield obesity, a process that operates through an individual’s rate of metabolism.\footnote{“Globalization of food systems in developing countries: impact on food security and nutrition”, FAO Food and Nutrition Paper 83, Food and Agriculture Organisation of the United Nations, Rome, 2004.}

Finally, the severity of food insecurity experienced in a country might explain the divergence between the developing and developed world. In the developed world, mild and moderate (or relative) food insecurity is more pervasive, while in the developing world more severe forms may be more prevalent. A number of studies have argued that “although mild or moderate food insecurity [may be] associated with a higher risk of obesity, severe food insecurity is associated with a lower risk”.\footnote{Cate Burns, “A review of the literature describing the link between poverty, food insecurity and obesity with specific reference to Australia”, Victorian Health Promotion Foundation, April 2004.}

**Interaction with the GFSI**

As discussed throughout this report, the relationship between food security and obesity is fraught with difficulties. Unsurprisingly, the ways in which the indicator interacts with the index, categories and individual indicators within the Global Food Security Index reflect these intricacies.

In general, the relationships between the obesity indicator and the GFSI are not overly strong. The overall index is only moderately correlated with obesity (correl = 0.60), highlighting the complex relationship between obesity and food security. Of the three categories—Affordability, Availability, and Quality & Safety—Availability demonstrates the weakest relationship with obesity (correl = 0.50).

Although the relationship between food security and obesity is often ill-defined, when dealing with extreme poverty it is simpler. Countries that have high proportions of their population under the global poverty line (living on less than US$2 per day), tend to have a very low prevalence of obesity. This indicator has the strongest relationship with obesity out of any in the GFSI (correl = -0.74). Seemingly, extreme poverty, where lack of access to food is a great concern, limits the onset of obesity.

In countries that do not have such high levels of extreme poverty, other factors, such as lifestyle, culture and access to healthy foods, tend to play a more prominent role. This reinforces the argument that obesity’s relationship with food security varies depending on the severity of the latter.

By contrast, the GFSI reveals that there is a weak relationship between obesity and nutritional standards (correl = 0.20). This is an important finding given the considerable emphasis on instituting policies, such as the US’s MyPlate, that aim to educate and inform individuals and monitor national nutrition. Although the GFSI does not explicitly explore the quality of national dietary guidelines or nutrition plans, or the extent of nutritional monitoring and surveillance, the existence of these programmes appears to have little bearing on the prevalence of obesity.

Likewise, obesity has a slight relationship with micronutrient availability (correl = 0.42), although protein quality (correl = 0.62) has a moderate one. This finding indicates that obesity is about much more than the nutritional content of an individual’s diet.

**Solutions and limitations**

While there is extensive research that must still be conducted to determine whether there is a meaningful relationship between food security and obesity and, if so, through what avenues it operates, there have already been steps taken to begin tackling the issues. As Theresa Nicklas and Carol O’Neil wrote in a recent report published by the Food and Agriculture Organisation (FAO) of the
Measuring obesity in the GFSI

In the GFSI, obesity is considered a background variable—provided to serve as a basis of comparison—and is not included within the index framework of Affordability, Availability, and Quality & Safety as an indicator that drives food security. This is a logical treatment of the topic, given the ambiguity of the causal relationship between food security and obesity.

The GFSI explores the prevalence of obesity through a variable that measures the percentage of each country’s population over the age of 20 that has an age-standardised body mass index (BMI) greater than 30.0. This metric, which relies on data and definitions from the World Health Organisation (WHO), is an industry standard. See the box on page 44, which discusses BMI and its limitations.

According to this metric, there is considerable variation in the prevalence of obesity across the globe. The lowest rates occur in South and South-east Asia and Sub-Saharan Africa, led by Bangladesh (1.1%), Ethiopia (1.2%), Nepal (1.5%) and Vietnam (1.6%). This is in marked contrast to Kuwait (42.8%) and Saudi Arabia (35.2%), which have the highest prevalence of obesity of the 109 countries in the GFSI.

United Nations and the WHO: “The obesity epidemic in the US and other industrialised countries has created the impetus to find an immediate and simple solution to a complex problem.”

Understandably, policymakers and other leaders need to define carefully what they are trying to accomplish and which paths will achieve those goals in the most appropriate manner.

A primary approach has been to propose either restrictions or taxes to alter consumers’ behaviours. Both Denmark and South Korea have instituted taxes on “fatty” foods, and some policymakers, including New York City’s former

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53 Fat tax elicits mixed reactions from S. Korean public”, Xinhua, January 1st 2012.

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mayor, Michael Bloomberg, have tried to implement bans on certain foods such as sodas and sweetened beverages. Many of these policies have proven to be deeply unpopular, and their effectiveness remains an open question.

Production-level interventions—for instance, sugar subsidies—are rather complicated and become intertwined with other policy areas, including trade law. Some studies have shown that such blunt tools have minimal impact on consumer prices and hence on consumer behaviour.⁵⁴

While consumption-level policies—especially those aimed at targeting energy-rich products—might have greater potential to curb obesity, they have their own limitations, particularly at higher-income levels, where consumers are less sensitive to price. Consumption taxes are generally complicated and can have undue and unexpected side-effects on consumption patterns. Such policies may promote undernourishment and thereby increase food insecurity or change behaviours in areas not pertaining to obesity—for instance, by impacting food waste.⁵⁵ More extreme proposals, such as direct taxes on excessive body weight, have been tendered as well. Although no formal “obesity taxes” have been implemented to date, indirect “taxes”, in terms of social and private-sector costs, already put an increased burden on the obese.⁵⁶

A second approach is to promote further education on how to lead healthy, nutritious lifestyles. Proponents argue that this may provide the necessary insight to limit obesity among the food secure and food insecure. Both Norway and South Korea have been applauded for their comprehensive nutritional programmes, which include educational components.

However, education programmes face their own problems, since it is surprisingly difficult to define a healthy lifestyle. Not only do different people require different amounts and types of food and physical activity, but scientists and advocates are not even fully cognisant of which foods and behaviours are “good” or “bad”—if such concepts even exist. Most education programmes, such as the Let’s Move! campaign in the US developed by the First Lady, Michelle Obama, advocate diets that avoid sweets, fat and other supposed junk foods and place a heavy emphasis on losing weight. Many nutritionists, however, argue that there is no such thing as bad foods and that people should be encouraged to address their cravings appropriately (to avoid bingeing). This is important in managing a healthy approach to food and avoiding the pernicious side-effects, such as eating disorders, that may develop if the wrong messages are sent. Additionally, one-size-fits-all approaches are often inadequate when defining something as personal as individual diet and exercise.

For instance, despite copious public service messages that emphasise the importance of reducing fat content in individuals’ diets, studies are showing that low-fat dairy may actually promote obesity. A recent study at the Harvard School of Public Health argues that “full-fat dairy may help control weight because it promotes more of a feeling of satiety than low-fat. Another possibility is that the fatty acids in full-fat dairy may help with weight regulation.”⁵⁷

Other approaches advocate addressing the issue at the source, rather than the consumer. Mitigating the reach and impact of food marketing, particularly on children, or encouraging expanded food and nutrition labelling have been proposals that have gained some traction. Likewise, school lunch programmes, which are often responsible for feeding a large proportion of the youth population, have been a topic of debate, with some experts claiming they are an optimal area to combat obesity. However, as Craig Gundersen of the University of Illinois argues, focusing on obesity in school lunch programmes may accelerate food insecurity in vulnerable populations.⁵⁸ While approaches that enter at earlier stages along the

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⁵⁵ Ibid.

⁵⁶ Ibid.


supply chain have the benefits of greater control by policymakers and a certain ease of implementation, they often run into questions of efficacy and appropriateness.

**Conclusion**

Undoubtedly, the obesity-food security relationship is complex, nuanced and still not fully understood. There are potentially different patterns and drivers exhibited across demographics, including socioeconomic status, culture, ethnicity, age and sex, and countries. While some experts argue that there may be a trade-off between policies that address obesity and those that tackle food security, particularly in developed countries, others, such as Dr Schwartz at the Yale Rudd Centre, claim that “it certainly does not make sense for people truly interested in food security and those who are truly interested in obesity to be working at cross-purposes”. The goal in both areas—to see that individuals have access to sufficient and nutritious food—may be simultaneously obtainable. Nonetheless, potential solutions in both the private and the public sector are often imperfect and rarely simple.

Such a high level of intricacy offers compelling reasons to avoid trying to comprehend the obesity-food security relationship within an overly narrow and unduly rigid perspective. Broad-sweeping policy solutions, on global, regional and national levels, may be inadequate given the complex nature of the issue, the significant role played by personal circumstances, and the many unanswered questions that remain. In recent years the harm of such one-dimensional policymaking has become apparent as the historical approach to addressing undernutrition, particularly in developing countries, has contributed to the growing prevalence of obesity. “As the experiences in Mexico and Brazil show, traditional poverty alleviation and food programmes can have unforeseen consequences, especially in environments where activity patterns have shifted toward more sedentary activity.”

Solutions to these problems may be easier to come by if stakeholders, including policymakers, politicians, non-governmental organisation (NGOs), individuals and the private sector, understand the complexity and uncertainty of the issue and work towards developing approaches that directly target the problems experienced by individuals or small groups. Such an approach would allow for the greater customisation of solutions and enable stakeholders to sort through the intricacies that have arisen on national-level analyses.

Whatever solutions are offered, it will be important to re-evaluate programmes continuously to ensure that they are yielding the desired results and create no spillover effects. Further research, discussion and debate will advance the understanding of these complex issues and hopefully show the way towards meaningful solutions.

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59 Interview with Marlene B. Schwartz, director, and Tatiana Andreyeva, director of economic initiatives, of the Yale Rudd Center for Food Policy & Obesity.

60 Ibid.

61 Ibid.
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