



## **Working Paper**

# **The Obesity Famine: The Dual Burden of Nutritional Insecurity in Transition**

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In recent decades, obesity has emerged as a real public health threat in most industrialized nations of the developed world. It follows logically for many researchers that increasing obesity is a signal of the nutritional transitions that go hand-in-hand with economic transition. In the vast literature on the subject, population obesity is often interpreted epidemiologically as a symptom of excess on the opposite extreme from starvation, the consequence of poverty. Yet, when we look at the distribution of obesity across socio-economic divisions within western nations, and the quiet emergence of obesity in developing nations as well, we see that the explanatory framework of excess oversimplifies the complex physiological and economic factors that impact obesity. Instead of viewing obesity and undernutrition as polar opposites, when we take an ecological perspective, it is possible to see both of these types of malnutrition as the dual manifestations of a similar process. In a world of rapid transition, it is worth reassessing our notions of food security and nutrition to see the underlying factors that drive food choices and body changes. Through an anthropological spyglass, we may be surprised to recognize the Obesity epidemic as the plumper face of a familiar, ancient antagonist—Famine.

For most researchers, a dramatic rise in obesity represents a society's distinct departure from the "Receding Famine Phase" and entry into the "Nutrition-Related Non-Communicable Disease (NR-NCD) phase" (Popkin 2002). However, as we dig deeper into causes, we see that this transition is as ambiguous as the link itself between nutrition and disease. Moreover, in the broader context of obesity as a function of *economic malnutrition*, it is worth asking ourselves whether we can meaningfully understand the obesity epidemic as a transition from one type of famine into another. Famine represents, among many things, a "political ecological crisis" resulting in food insecurity (Ulijaszek Lecture Notes 2008). In situations of famine, food

security— “the physical, social, and economic access to sufficient, safe, and nutritious food that meets the dietary needs and preferences of a population for an active and healthy life”—is lost among an increasing percentage of the population (Ulijaszek Lecture Notes 2008). It has long been argued that famines develop not only when food is unavailable, but when populations lack economic means to obtain adequate energy from available resources or the social structures needed to maintain nutritional balance for individuals. As famines progress, more individuals begin to suffer from food insecurity— “undernourishment due to physical unavailability of food, lack of social or economic access to nutritional lifestyle, and/or adequate food utilization” (Ulijaszek Lecture Notes 2008). While food insecurity traditionally refers to conditions of *undernourishment*, we should broaden this definition in our contemporary context to include other forms of malnourishment. It seems entirely appropriate then to introduce the notion of food insecurity to explain obesity as a consequence of the unavailability of certain types of nutritious food, the inaccessibility of nutritional lifestyle due to social and economic forces, and the improper utilization of food.

While obesity is often discussed in terms of dietary factors, it is crucial to make a distinction between *diet* and *nutrition*. Barry Popkin’s comment on this point is clear: “We use nutrition rather than diet so that the term nutrition-related non-communicable disease incorporates the effects of diet, physical activity and the body composition rather than solely focusing on dietary patterns and their effects” (Popkin 2002, 206). Thus, nutrition refers to something much more complex than just food. We need to understand nutrition as a healthy balance between micro and macronutrients, energy intake and activity expenditure, and genetic/developmental predispositions and physiological responses. Nutrition in this sense is in increasingly short supply for many transitioning populations in the industrialized world. Perhaps

we can reevaluate the notion of famine as a result of *food insecurity* and appreciate a more comprehensive reality of famine in a NR-NCD transition that is the result *nutrition insecurity*. If we then accept that famine refers not merely to a population's access to food, but access to nutrition, it seems only logical to apply the famine concepts to obesogenic environments that lack nutrition.

One of the clearest indicators that suggests we should see obesity and famine in the same framework is the paradoxical but increasing trend of overweight and underweight individuals living in the same household. Obesity and undernutrition are both conditions of malnutrition, not simply because they are both “bad”, but more critically because both represent situations in which adequate nutrition is missing. This nutrition insecurity is a function of economic transition. Benjamin Caballero comments on the emergence of this *dual burden* of disease:

The combination of underweight in children and overweight in adults, frequently coexisting in the same family, is a relatively new phenomenon in developing countries undergoing the nutrition transition—the changes in diet, food availability, and lifestyle that occur in countries experiencing a socioeconomic and demographic transition. In such countries, as many as 60% of households with an underweight family member also have an overweight one, a situation that has been dubbed the dual burden household. (Cabellero 2005, 1514)

In order to appreciate the dual burden as a function of the obesity famine we should step back briefly and look at the evolutionary forces behind human nutrition. Human eating behavior has evolved over thousands of years to meet both biological and social needs. Because food is both a fundamental nutrient and also a symbol of many social processes, food choice is influenced by complex forces. Stanley Ulijaszek comments that “there are two key features of human eating behavior that are not shared with animals on any appreciable scale: complex control of food availability and the maintenance of complex social and cultural norms of diet and

eating” (Ulijaszek 2002, 517). Control of food availability and the social and cultural processes associated with contemporary nutrition are changing rapidly. Research has begun to assess the extent to which economic transitions are manifested in the form of nutritional transitions. It is clear that industrialization greatly impacts the abundance of certain types of food while restricting access to others, and economic factors influence social and culturally determined food choices. To assume that obesity is merely a problem of excess connected to higher income and greater food availability is a drastic oversimplification of the problem. Benjamin Cabellero again:

Traditionally, obesity has been linked with abundance, and it was anticipated that as developing countries improved their economic status and their GNP, undernutrition would decrease and obesity would begin to appear among members of the upper socioeconomic classes. But the relationship between GNP and overweight is complex. Although being poor in the poorest countries indeed “protects” against obesity, being poor in a middle income country is actually associated with a higher-risk of obesity than being richer in the same country (Cabellero 2005, 1514)

This disturbing trend challenges the common assumption that poverty is associated with undernutrition and wealth is associated with obesity. While this may be true to a limited extent across nations, within transitioning societies we see that this is not the case. It is often assumed that industrialization and economic growth automatically improve both GNP and nutrition positively. The standard model of obesity as a function of economic growth dictates that as GNP increases, energy intake increases, energy-demands decrease, and BMI’s increase. This is contrasted with the standard famine scenario where GNP decreases, energy-intake decrease, energy demands increases, and BMI’s decrease across a population. However, when we recognize that nutritional security is much more complex than just the presence of calories, we see that access to various components of nutrition does not increase uniformly with economic development. In fact disparities between segments of a population may increase as GNP

increases. When economic growth widens these intra-societal disparities, we see that the nutrition transition is played out differently across socio-economic levels. In many of these transitioning societies being poor increases the risk for both undernutrition and obesity.

We must also accept that social norms regarding food prestige influence food choice decisions differently in developing versus developed countries. Frequently, in industrialized societies, access to fresh fruits and vegetables, lean healthy meat and fish, and exercise and leisure activity is associated with higher socio-economic status. In these same countries, lower economic status is associated with higher intake of inexpensive, energy-dense, nutrient-poor “junk foods” and less physical activity. In contrast, in the developing world, higher socio-economic status is often defined by greater access to westernized products such as automobiles, TV’s, soft drinks, and processed foods, while lower socio-economic groups live at subsistence levels off fresh foods that are often grown themselves with a great deal of energy expenditure. In some ways, the obesity risks associated with socio-economic status are inversed when we compare developing and developed nations. What is clear everywhere though, is the understated fact that nutritional security for a healthy life is expensive.

The research of Adam Drewnowski and Nicole Darmon emphasizes that “healthy diets cost more” (Drewnowski 2005, 265s). They ask, “does the obesity problem lie with fast-food outlets and vending machines, or are there broader social issues that have to do with the falling value of the minimum wage, the lack of health and family benefits, and declining neighborhood resources?” (Drewnowski 2005, 271s). Their analysis of economic food decisions in industrialized nations demonstrates that the clear “inverse relationship between energy density foods (kilojoules per gram) and their energy cost (dollars per megajoule) means that the more energy-dense diets are associated with lower daily food consumption costs and may be an

effective way to save money” (Drewnowski 2005, 265s). Yet, there are many physiological consequences for members of a family subject to this type of economic food decision making. Several studies have shown how cheap, energy-dense, nutrient-poor foods may adversely affect the growth of children but may provide sufficient calories for adults to gain weight (Caballero 2005, 1515). In this way we can see how nutrition insecurity generates both obesity and undernutrition.

Appearance of obesity is not merely a function of more money and more food; the presence of undernutrition and obesity within families and populations reminds us that we are dealing with a complex scenario. However, there do seem to be two primary ways of interpreting the presence of intra-household undernutrition and obesity in the context of economic transition. On one hand we can look at the dual burden as merely a function of transitional stage, where some members who are more at risk of infectious disease and nutrient deficiencies remain under-nourished, while other family members with new types of lifestyle demands gain excess weight while eating energy-dense foods. The implication of this model is that it is only a matter of time until the undernourished catch up and gain weight. Collen Doak comments on this interpretation: “because the transition from undernutrition to overweight occurs first among adults, households with an underweight child and an overweight adult were expected to be most related to the nutrition transition” (Doak et al 2002, 216). This model is supported by studies that show a dramatic increasing emergence of undernourished children and overweight mothers in Latin America. Garret James refers to this trend as SCOWT- “stunted child and overweight mother” (Garrett 2005). In this framework, the dual burden is seen as an intermediate nutritional stage in the course of transition from one type of economy to another.

In contrast, we can also look instead at undernutrition and obesity as dual end-points, or as two manifestations of the same underlying economic pattern that generates nutritional imbalance. Doak herself argues more persuasively for this interpretation: “The coexistence of over and underweight in close proximity suggests that common risk factors contribute to both conditions. If so underweight and overweight may have to be considered as two expressions of very similar causal mechanisms related to diet, physical activity, and socio-demographic environments...” (Doak et al. 2000).

The link between childhood stunting and obesity is one area of inquiry that seems to support the notion of similar underlying causes for undernutrition and obesity. Moreover, if stunting is the result of malnutrition, and there is a clear link between stunting and obesity, we can again see obesity as a function of famine. There are several factors that can influence stunting as a result of chronic malnourishment among developing children. Yet, its clear that stunting is not merely related to food access, for stunting persists in many countries where food is relatively abundant. Barry Popkin comments that “in the past stunting and access to food were highly associated, but that linkage may not be as apparent now in countries undergoing to nutrition transition” (Popkin 1996, 3015). Popkin outlines the role of inadequate weaning practices, infection, and improper energy-dense, nutrient-poor diets. Popkin illustrates scenarios from China, Brazil, Russia and South Africa, in which childhood diets are “limited in essential nutrients required for linear growth but not adipose tissue” and also how “early nutritional programming” may result in a number of hormonal effects that limit linear growth while increasing likelihood of weight gain (Popkin 1996, 3009). Daniel Hoffman in his paper “Why are Nutritionally Stunted Children at Increased Risk of Obesity,” suggests that childhood



nutritional stunting is associated with impaired fat oxidation, a major factor that has predicted obesity in other at-risk populations” (Hoffman 2000; 702).

The association between stunting in early childhood and later obesity brings us to the contentious issue of “thrifty” phenotypes. DJ Barker’s research in this regard has suggested that fetal insults can lead to metabolic adaptations and hormonal changes that lead both to stunted growth and abdominal obesity in adult life (Popkin 1996, 3009). These lines of research support the notion that nutrition insecurity can lead to undernutrition and obesity in the same person at various stages in his/her life. Yet, several important questions remain. It has been suggested that this correlation is merely a result of the fact that in comparing stunting (height/age) and BMI (weight/height), height is calculated as both the numerator and the denominator respectively. Perhaps this trend then is merely a result of the fact that smaller heights contribute statistically to both greater stunting and larger BMI’s. However, Popkins concludes in his paper “Stunting is Associated with Overweight in Children of Four Nations that are Undergoing the Nutrition Transition,” that this pattern of stunting and obesity is not merely a function of statistical analysis, but rather a new phenomenon associated with economic change:

Why have researchers not found this pattern of stunting and obesity at earlier periods of history when high rates of stunting also existed? The most logical reason is that the underlying social and economic circumstances that caused the high level of stunting did not provide the bases for obesity to emerge as a public health concern...Researchers interested in stunting were focused on problems of infectious diseases and undernutrition and not worried about obesity...Poor socioeconomic conditions did not allow for the expression of obesity in the population. The nutrition transition with the rapid shift in the composition of diet and activity patterns provides the conditions for the complications of stunting to emerge. (Popkin 1996 3015)

In the discourse of epidemiological transition, it is often asserted that as the chronic non-communicable diseases of the “New World Syndrome” emerge, poverty diseases associated with

infection and undernutrition will fade out (Zimmit 2000). Yet research into stunting and its long term implications suggests that we should be looking at the transition less as a trade off in terms of one disease burden for another, and more in terms of the presence of emerging societal dynamics that cause persistent challenges like nutritional insecurity to play out in new disease relationships. It may be reassuring for public health policy makers to feel as though they can pay less attention to the impact of famine as their countries develop economically. Sadly, public health strategies based on this simplistic epidemiological logic may perpetuate rather than alleviate nutrition related disease burdens. We have to look beneath the layers to see the subtle reincarnations of nutritional insecurity that continue to impact disease. Just as new fat imaging techniques shows that thin body shapes may mask the unhealthy presence of fat in organs and internal tissues and their profound deleterious effects, on a societal scale we would irresponsible to assume from a surface analysis that the obesity epidemic is only a problem of excess; when we look underneath the skin of our transitioning societies we see that many deficiencies remain.

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