

## Review article

# Food security measurement in cultural pluralism: Missing the point or conceptual misunderstanding?

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**Abstract**

**Objective:** Food Security has become a global concern, yet its measurement has varied considerably across disciplines and countries. We examined the current discrepancies in the definitions of food security and propose a framework for understanding and measuring food security.

**Methods:** This conceptual review draws from a range of works published in Medline and the gray literature to advance the understanding of food security concepts. We begin by examining the historical background of food security and then move on to examine its various definitions and interpret food through cultural lenses in terms of food access and utilization. We finish by examining various measurements and indicators of food security and reviewing implications for public health.

**Results:** We argue that the reliance on coping strategies as surrogate measurements of food insecurity without taking into account the social, cultural, and political contexts in which they occur is misleading, and viewing food insecurity solely from a food access or availability perspective, without taking into account food utilization and asset creation as pillars of food security, paints an incomplete picture. Although this review does not claim to provide solutions to the discrepancies in the conceptual definition of food security, it attempts to highlight areas of concern and provide a way forward.

**Conclusion:** When coping strategies are used as an indicator of food insecurity, they need to be culturally relevant and focus tested, and together with objective measurements of nutritional outcomes, would allow policy makers to make evidence-based decisions to inform social and nutrition policies.

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**Keywords:**

Food security; Coping strategies; Food access; Food utilization; Assets creation

**Introduction**

Over the past three decades, Australia, like many developed countries, has been experiencing dramatic demographic transformations as a result of the surge in the number of migrants [1,2]. Australia is internationally known to be one of the most culturally and linguistically diverse countries in the world: 30% of Australians are from a culturally and linguistically diverse (CALD) ancestry [1], and Australians follow more than 100 religious faiths and speak more than 150 languages [3]. A considerable proportion of Australian residents born overseas come from countries recently affected by war and political unrest. Thus, many newcomers are refugees and humanitarian entrants [1]. This cultural pluralism is characteristic of many developed countries such as the United States of America, the United Kingdom, France, and many Nordic countries [4].

Once in their host country, food insecurity is among the most pressing needs experienced by humanitarian entrants [5,6]. This is often exacerbated by their poor health and nutritional condition on arrival, postmigration food and economic stress, language difficulties, low self-esteem and mental health, and an array of cultural and religion-related barriers such as male–female relations or prejudice and discrimination [7]. However, studies measuring food security among humanitarian entrants to developed countries have mainly been biased toward food availability (supply) and access [8,9], and in most cases, the assessment of food security at the household level has been narrow and biased toward coping strategies (e.g., help from relatives and friends or

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skipping meals) when families experience food and financial stress [6,10]. For example, using coping strategy as an indicator of food insecurity at a household level, a recent study in Perth, Australia, found that 71% of refugees reported running out of food (14 times greater than the 5.2% recorded across all social and economic groups in the 1995 National Nutrition Survey) [5]. The study reported that most cited reasons for running out of food included poor household and budgeting skills, large household bills, late welfare payments, sending money “home,” and transport issues.

The emphasis on coping strategies as a surrogate measurement of food insecurity at the household level in a culturally pluralistic society such as Australia could be misleading and lead to inappropriate policy formulation. For example, normal patterns among Sudanese before migration include crop production, migration and wage labor, kinship support and food sharing, food stores, and market purchases (Fig. 1). In this setting, food sharing and kinship support play a social function geared toward ensuring community cohesion and establishing social hierarchies in terms of leaders and followers, strong and weak, and rich and poor through offerings and ritual meals. Consequently, the practice of food sharing among families or community members, sharing resources, or providing for needy neighbors are not often seen as a coping mechanism against stress but rather a cultural obligation and a prerequisite for cultural harmony and community cohesion. Depending on each traditional kinship structure, these practices are based around the notion of reciprocal obligations and do not necessarily reflect coping mechanisms. However, strategies used by CALD communities in developed countries after migration to adapt to their new economic and food environment are complex and multidimensional, often determined by social (e.g., premigration exposure and practices or family structure), cultural (e.g., food beliefs, feeding practices, and hierarchies in decision making), and environmental (e.g., food and environment,

neighborhood) factors. These strategies do not necessarily represent coping mechanisms in response to financial and food stress [11–13].

Indeed, CALD refugees and migrants in developed countries come from countries where food supply relies on subsistence farming [13], and some come from refugee camps and transitional countries where the main source of food is food aid and emergency assistance [11,14]. In most cases available food is unequally distributed due to social and cultural norms [15]. For example, in countries providing the majority of refugees and migrants to Australia, women are responsible for almost 80% of the food production, but still experience poor purchasing power and limited access to and utilization of the food and resources they have created because they are often in subordinate roles [16]. Yet, after migration, CALD refugees and migrants find themselves in an Australian food system that is heavily regulated and characterized by fresh food markets and groceries, restaurants, food processing, direct food marketing, food service, and the subsequent need to develop household cooking skills [9,10]. Consequently, the coping mechanism and poor utilization of available food could be more related to the complexity of the new food system than inadequate availability of and access to food. So, focusing on coping mechanisms or food availability and access alone as a framework for analysis of food security among CALD communities, without taking into account food utilization and its determinants, would paint a false picture and miss the point.

### Food security: a historical perspective and definition

Despite the vast literature on food security, the concept of “food security” has been evolving over the past four decades and remains complex and multidimensional. By 1948, 58 state members of the United Nations General Assembly adopted the Declaration of Human Rights [17]. The

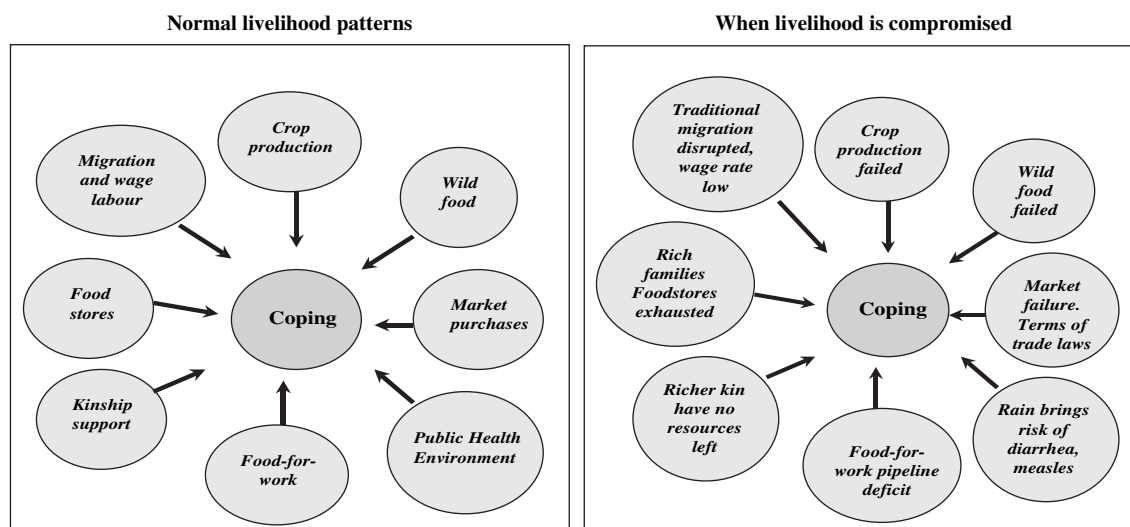


Fig. 1. Principal factors undermining coping strategies in Northern Darfur, Sudan (adapted from Collins [58], p. 28).

declaration accepted and established fundamental rights for every human including the right to an adequate standard of living including rights to food (Article 25). This was further elaborated in Article 11 of the International Covenant on Economic, Social and Cultural Rights adopted by the General Assembly in 1966 [18,19]. However, at that point, no clear definition of “food security” existed. It was not until the first World Food Conference, in 1974, that a definition of ‘food security’ emerged. The conference resulted in the “Universal Declaration on the Eradication of Hunger and Malnutrition,” which was accompanied by 12 solemn proclamations [20,21]. The most dramatic declaration, however, was that of Henry Kissinger, then the United States’ Secretary of State, who asserted that “by 1984 no child, woman, or man would ever go to bed hungry” [22].

The 1974 World Food Summit defined food security as: “availability at all times of adequate world food supplies of basic foodstuffs to sustain a steady expansion of food consumption and to offset fluctuations in production and prices” [21,23]. Although earlier definitions of food security emphasized “food availability,” in 1983 the Food and Agriculture Organization of the United Nations revised its definition and expanded it to emphasize “both physical and economic access” to food to meet dietary needs [24]. Since then numerous definitions and revisions have emerged. By 1992 Maxwell and Frankenberger [25] had inventoried 194 different studies on the concept and definition of food security and 172 distinct studies on indicators. By 1999, Hoddinott [26,27] estimated there were more than 200 definitions of the food security concept. The 1996 World Food Summit added two more dimensions: the concept of “safe and nutritious” food commensurate with dietary needs and “food preferences” required for an active and healthy life [28].

One definition by the United States Department of Agriculture, which is the most cited in the United States of America [29–32] and other industrialized countries [8,29], introduced other dimensions, which in many cases are misleading and inappropriate for many countries experiencing natural and human made disasters, and whose population’s livelihood relies on migration wages, kinship support, or wild animal and food hunting as part of its normal livelihood mechanism (Fig. 1). The definition asserts that food security refers to:

access by all people at all times to enough food for an active, healthy life and includes at a minimum: a) the ready availability of nutritionally adequate and safe foods, and b) the assured ability to acquire acceptable foods in socially acceptable ways (e.g., without resorting to emergency food supplies, scavenging, stealing, and other coping strategies) (p. 1575) [33].

This definition does not hold together when interpreted within the current political and economic situations. Indeed, although the nature of food insecurity tends to be similar in developing and developed countries [34], the environmental setting in which it occurs differs considerably. In African countries, drought, armed conflicts, inadequate agricultural

policies, and poor governance have combined to affect household livelihood, and this has been worsened by the human immunodeficiency virus/acquired immunodeficiency syndrome epidemic [35–37]. As a consequence of the human immunodeficiency virus epidemic, many farms have been left uncultivated as economically active adults continue to die, leaving orphans and elderly people at risk of hunger and malnutrition. Thus, it is currently estimated that some 60% to 70% of farms in sub-Saharan Africa have had labor losses as a result of human immunodeficiency virus/acquired immunodeficiency syndrome [36,38]. In less developed countries of the Pacific region, however, the causes of food insecurity have included high population density, limited human resources, lack of skilled labor due to high migration within islands and overseas, limited access to markets due to difficulty of community outreach and interisland transportation, declining soil fertility, land ownership issues, and natural disasters [34,39]. Therefore, in this case, applying the livelihood framework to assessing levels of food insecurity becomes the best option because such a framework would differentiate households accumulating assets from those maintaining their existing assets or those depleting their assets in response to financial and food stress [40].

For example, Figure 2 suggests that in cases of human made or natural disasters, emergency food and relief are provided to the affected population and such interventions are implemented according to internationally adopted and prescribed guidelines [41]. Chapter 3 of the Sphere Humanitarian Charter and Minimum Standards in Disaster Response (SPHERE) provides minimum standards in food security, nutrition, and food aid in the context of complex emergencies [41]. Most importantly, the guidelines set the nutritional requirements at 2100 kcal per person per day, of which 10% to 12% come from protein and at least 17% from fat. The question then becomes, What are the boundaries of “resorting to emergencies?” Would a population on food aid programs that meet the prescribed SPHERE guidelines be classified as food insecure? In most traditional societies, including emergency situations, kinship support and wild animal and food hunting are part of the normal livelihood mechanism (Fig. 1). Would relying on fishing, hunting, or remittance during the planting and harvesting period be considered adequate?

In contrast, in developed countries, food insecurity is closely linked with income and wealth inequality and with social exclusion and disadvantage [8,42]. Even in this situation, Hamelin et al. [29] raised similar questions. They noted (p. 528S) that, “one can ask: what are the boundaries of other coping strategies?” Questions they raise include: Is parental support at an advanced age or eating on credit considered acceptable? Is acquiring supplemental food through the Montréal Diet Dispensary or related programs in Québec, or WIC vouchers (The WIC program is the U.S. Supplementary Feeding Program for Women, Infants, and Children. The program provides supplementary foods, nutrition education, and health care and social service referrals to low-income

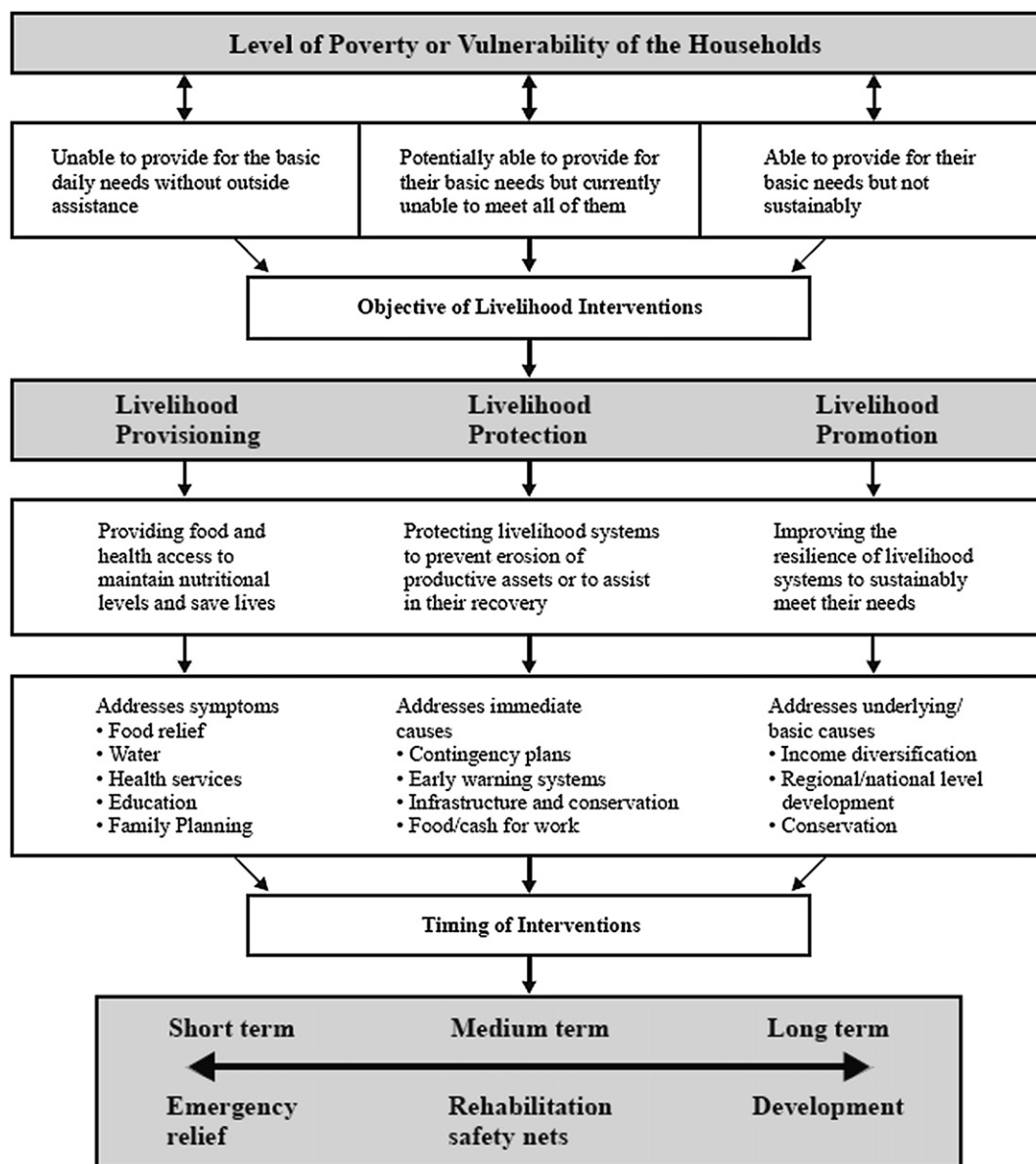


Fig. 2. The Livelihoods Framework and the Relief to Development Continuum (adapted from Drinkwater and Rusinow [59], p. 5).

pregnant, breastfeeding, and postpartum women, to infants, and to 1-to-4 year old children who are at nutritional risk. It is estimated that almost 50% of all infants and 25% of all children aged one to four years participate in the WIC program [43,44].) or food stamps in the United States acceptable? If yes, what strategies are they part of? Are current efforts and resources in society adequately balanced between short-term strategies to alleviate food insecurity and those that are more clearly directed at its specific prevention? What are the generally accepted social norms related to food access, as we embark on the 21st century? Does the fact that an increasing number of households resort regularly to food pantries indicate the dawn of a new norm? Although the investigators have provided guideline for assessing the social acceptability of practices related to food security, these remain unanswered questions. We believe that the definition

and assessment of food security should be context specific (stable versus emergency environment) and have different requirements according to different structural levels (national versus community and household levels). Another element that is missing in all the definitions is that of asset creations. Hence, food security should be viewed as having four different but inter-related pillars: food availability, food access, food utilization, and asset creation (Fig. 3).

#### Food availability and access

Food availability usually refers to the physical availability of food through national food stocks and commercial food imports; farming, community gardens, and harvesting (own production and reserves); purchasing (the market) or bartering; hunting wild food and fishing; and food handouts

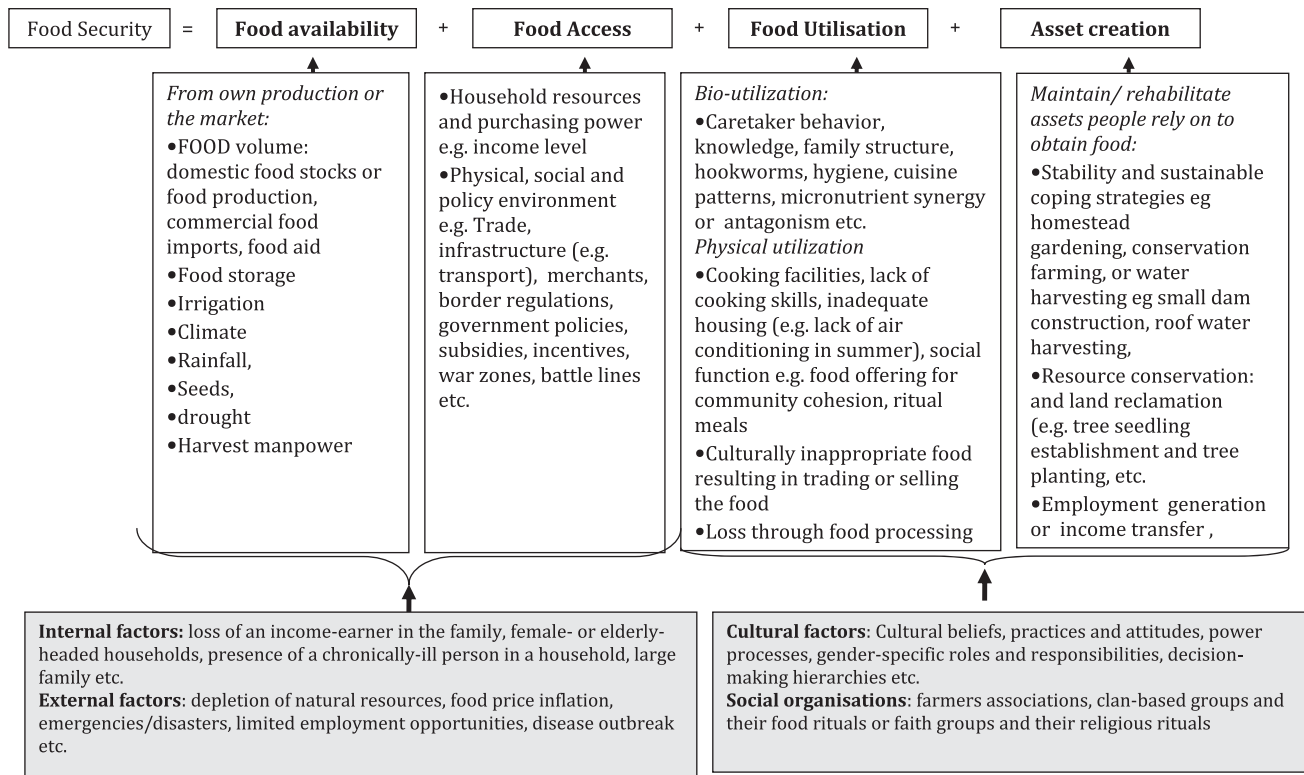


Fig. 3. Elements for analysis in food-security assessment.

(e.g., food aid). Indicators of food availability may include variables such as crop production or food production index (e.g., average cereal yields per hectare or food production per capita, food available per capita) or livestock ownership or possession index. In contrast, financial and physical access to food refers to the equal distribution of the food available using existing structures and resources. There are many factors that come into play when examining access to food and these include, inter alia, income level, food cost, physical and social environment (e.g., geographic remoteness or density of grocery stores per capita), government and trade policies, and food and value systems. Indicators of food access may include food price monitoring (e.g., analysis across years, intra-annual analysis, spatial analysis, or terms of trade analysis<sup>†</sup>), the diversity of household income sources, food handling and storage losses (percentage of food losses during storage), household asset index, debt-to-asset ratio, dietary diversity, coping strategies index, and household expenditures indices (including total expenditure on food). There are various survey methods that can be used to assess the

adequacy of food availability and access and these include the healthy food access basket survey, household expenditure survey, and food retail or outlet surveys.

Adequate food availability and access do not translate into food security at household, community, and societal levels. Conforming to the demand–supply curve, not only is food access influenced by availability of food, it is also influenced by the household's purchasing power and access to resources that allow the household to pursue activities that meet its income and food security objectives. In addition, access to food alone does not necessarily mean that a household or individual members of that household are food secure. Unless the available food is nutritious and can be accessed by all household members, unequal food distribution within a household could in itself lead to food insecurity-related nutritional disorders. The overemphasis on food access as a measurement of food security has led to the notion of a “food desert,” where urban districts with little or no access to foods needed to maintain a healthy diet, but often served by plenty of fast food restaurants, are described as food insecure [45,46]. Yet the distribution of food available at the district or household is dictated by many factors such as cultural and ideological norms, the level of literacy, family structure and dynamics, political and economic factors, and the mass media. For example, in our study among sub-Saharan African migrants in Australia, we found that before migration food is culturally constructed and classified into food for the poor and luxury food, and this concept extended after migration [47,48]. The expression “eating like a white person” is often

<sup>†</sup> Terms of trade analysis: Comparing commodity prices at the same location (how do relative prices for 1 kg of apples compare among the various supermarkets in locality A?). Analysis across years: Comparing commodity prices for the same period in a reference year (e.g., how do prices for 1 kg of apples in October 2007 compare with the prices for 1 kg of apples in October 2008?). Intra-annual analysis: Are fruit, vegetable, or cereal prices following a seasonal change? Spatial analysis: How do prices for apples at one market in locality A compare with prices for apples at another market in locality B?



used to describe an eating pattern that includes meat and animal products—often accompanied with a glass of beer—on a regular basis, with reduced consumption of vegetables, legumes, and fruit, which are often less desired and seen as survival food for poor people and are bought only by those who cannot afford to consume the more expensive and highly regarded animal products. Therefore it does not matter how many fruit and vegetable groceries are made available in suburbs with high concentrations of African migrants; buying and consuming these food is culturally bound. Hence, the notion of a food desert or the adequacy of food availability and access alone cannot be sufficient and robust to assess the level of food security without taking into account the other two pillars of food security: food utilization and asset creation.

### Food utilization

The United States Agency for International Development policy determination states that utilization is realized when “food is properly used; proper food processing and storage techniques are employed, adequate knowledge of nutrition and child care techniques exist and are applied, and adequate health and sanitation services exist” (p. 4) [49]. From this definition, it is evident that there are two forms of food utilization: physical utilization and biological utilization. The physical utilization reflects the ability of a household to have all the physical means to use food available. This may include cooking utensils, culturally regulated feeding hierarchies, cuisine patterns, adequate housing, caretaker behavior, knowledge, family structure, and workload. In our recent study examining food habits among African migrants to Australia, we found that 33% of the 138 interviewed households ate at a takeaway fast food shop at least once a week. Of these 25% did so due to lack of time to cook, 9.2% due to lack of cooking facilities or trying to avoid cooking in summer due to lack of air conditioning (cooking heats up the house), and 0.8% due to not knowing how to cook. In contrast, biological utilization is concerned with the ability of the body to effectively use the nutrients once the food is consumed. Biological utilization is compromised by many factors including infection (increased nutrient demand), poor hygiene that could lead to diarrheal diseases or infestation (e.g., hookworms), micronutrient synergy, or antagonism. Hence, examining household food security requires a consideration of a public health framework that not only assesses food availability and access but also examines diet adequacy, access to clean water, housing conditions, sanitation, and health care. That is why objective measurements of food insecurity should include food consumption indicators in the short term (e.g., breast-feeding initiation and duration, food intake, food habits and practices) and nutritional status parameters in the long run (obesity, undernutrition, relative weight growth among children, serum measurements of micronutrients such as iron, vitamin A, and so forth).

### Asset creation and institution building

Asset creation as part of food security initiatives is concerned with putting in place structures and systems that sustain a household's or individuals' ability to withstand sudden shocks that threaten their access to food including economic and climatic crises (e.g., drought, flood) or seasonal food shortage. Asset creation needs to be built on five types of capital assets: human, natural, financial, social, and physical [50]. The physical dimensions of asset creation should address basic infrastructure such as roads, water supplies, health, and schools. The sustainability of physical assets depends on the community's involvement in establishing such assets and community ownership. As Bennett [51] noted, protecting physical assets includes establishing a legal or regulatory framework that protects people in terms of resolving issues related to property and land ownership, access to public services, and security. The dimensions of human capital for food security may include knowledge creation and the generation of key leaders in the various aspects of the food system such as food production (growing and harvesting) food processing and packaging, food storage and transporting, food waste management, food marketing or market regulation, and prevention of the destruction of knowledge networks brought about by population displacement. The dimensions of natural capital for food security focus on natural resource conservation and land reclamation. The financial assets for food security encompass employment generation and income transfer and money supply through diversified loan sources and affordable credit alternatives. For example, Bennett reported that poor farmers too often sell a major proportion of their produce immediately after harvest to repay debts. When the debts cannot be paid fully, the consequences include increases in land sales and young people moving to cities in search of alternative income. Social capital as an asset for food security is indispensable because it addresses issues related to trust, reciprocity, and social networks. For example, in their study examining the relationship between social capital and the risk of hunger, Martin et al. [52] found that social capital, at the household and community levels, was significantly associated with household food security, and that the relation was stronger for dimensions of reciprocity among neighbors. They also found that, among households experiencing financial distress or limited food resources, those who exhibited higher levels of social capital were less likely to experience hunger.

### Public health implication and conclusion

Food insecurity is closely linked with nutritional outcomes as measured by anthropometric, biochemical, or clinical parameters and other adverse health outcomes. Cook et al. [53] found that children in households that are food insecure without hunger had significantly higher odds of having fair/poor health and of being hospitalized since birth

than children from food-secure households. The researchers speculated that, although food insecurity as measured by a coping strategy index does not involve measuring reductions in the quantity of food intake sufficient to involve measurable hunger, overall food insecurity is associated with adverse health outcomes in young children. Similarly, available data suggest that there is a direct relation between food insecurity and obesity in developed countries and undernutrition in developing countries. Food-insecure individuals are 2.8 times as likely to be obese [54] and 3 times more likely to be underweight than their food-secure counterparts [55]. Furthermore, food insecurity has been found to be associated with lower consumption of fruit and vegetables [56].

Hence, it is important that a food-insecurity measurement is multilayered. Objectively, indicators of food insecurity in the long run should include components of the core measurements of the nutritional status of individuals or communities being researched. For example, because food insecurity negatively affects the quality of the diet and diversity [56], the ultimate consequences could include undernutrition, micronutrient deficiencies, and obesity. In the medium term, indicators of food insecurity should stress individual food and nutrient intakes, household food and nutrient acquisition, and dietary diversity (e.g., food-frequency questionnaires or 24-h recall). In the short term, indicators of food insecurity should include coping strategy parameters.

Although coping strategies are indirect measurements of food and nutrient intake, they are nonetheless the most used in studies on food insecurity. Although coping strategies as an indicator of food insecurity are easy to implement and robust in classifying households according to their vulnerability, they are unfortunately a subjective measurement and open to various cultural interpretations. In addition, coping strategies are based on a linear feeding pattern where parents will sacrifice themselves to allow children to eat when food becomes scarce. In this case, any coping strategies employed at the household level to stave off hunger will affect adults first, followed by children. Thus food insecurity with hunger in children is severe. This is indeed a Western interpretation and is not applicable to most traditional cultures where the breadwinner has to be fed first. In most developing countries and among migrants from developing to developed countries, the feeding of the breadwinner, often the men (e.g., fathers) precedes that of children. This remains true even in case of food scarcity. For example, in our study of coping strategies in Lesotho, women indicated that feeding the husband is priority number one. They noted that if they reduce the food served to their husbands, the latter would become skinny and would no longer be able to perform physical work. However, they reiterated that if “a man becomes skinny he can no longer satisfy the wife and this could be a cause for divorce ... it is within the woman’s interest to feed the husband as the most significant thing in a relationship is to satisfy a woman” (ref [57], p. 40). Such a culturally determined approach to feeding practices is founded on the role each family member plays in the household. Hence, in this case food

insecurity with hunger in adults would be more likely to represent severity in food scarcity than food insecurity with hunger in children.

In all, data on food insecurity and its relation to health consequences are not consistent and difficult to operationalize in terms of public health policies because of the diversity in food insecurity indicators. For example, when using coping strategies as an indicator of food insecurity, some studies have reported a positive dose–response between food insecurity and increased risk of obesity [54], whereas others could not find any relation [55,56]. Therefore, when coping strategies are used as an indicator of food insecurity, they need to be culturally relevant and focus tested. Having subjective measurements that are culturally focus tested, together with objective measurements of nutritional outcomes, would allow policy makers to devise culturally competent food programs intended to alleviate hunger and its long-term effects and to make evidence-based decisions to inform social and nutrition policies.

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