

# Food Insecurity Outcomes: Are We Using the Right Indicators?

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The term "food security" came into vogue in international development literature during the 1960s to denote the ability of a country or region to assure adequate food supply for its current and projected population. Taking note of the fact that mere food grain availability does not lead to food security, the World Food Summit in 1996<sup>1</sup> defined food security as a situation in which "all people, at all times, have access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life". This FAO definition provided the link between food, nutrition and health. Many countries use the term "food and nutrition security" to indicate this broader concept.

In that same year, the World Food Summit also set a specific goal for improving food security worldwide. It proposed that, by the year 2015, the number of food-insecure persons should be reduced to half of the 1990 figure (~800 millions). All countries provide data on food production, import, export and net availability of food at national level to FAO. FAO collects, collates and publishes reports on the production and consumption of all major food stuffs at country, regional and global levels. The FAO's annual publication "State of Food Insecurity" and food balance sheets are the major sources of information on progress towards this goal.

Most countries and regions had reported steady but slow progress towards this goal upto 2007. The steep global inflation in food prices in 2007-8 inevitably led to an increase in the number of food-insecure persons; indeed, it was even feared that if food inflation persisted, the number of food-insecure persons could in fact rise well beyond the 1990 level.

In 2012, the FAO<sup>2</sup> reported that the number of hungry persons declined more sharply between 1990 and 2007 than had previously been believed. If the rate of reduction in hunger during the past 20 years continues, it is expected to reach 12.5% in 2015, which is close to the Millennium Development Goal (MDG) of 11.6%. However, the number of people suffering from chronic hunger is still unacceptably high, and eradication of hunger remains a major global challenge.

Gaps in availability, access and absorption are being assessed through indicators of 'Food insecurity outcome'. The parameters used to assess the food insecurity outcome are child mortality, undernutrition and micronutrient deficiencies in all age groups, especially, in preschool

children. The cause-effect relationship between low dietary intake/undernutrition and infection in preschool children has been well established. It is well documented that undernutrition is associated with immune depression and increased susceptibility to infections. Infections lead to nutrient losses and aggravate undernutrition. If this vicious cycle is not interrupted by health and nutrition care, it can lead to death. Whenever these indices are used for comparisons within the same country – between income groups, or between those living in rural and urban areas, the relationships among food insecurity, undernutrition, and high under-5 mortality is clear and consistent. However, when the comparisons are made between countries and regions, there are some inconsistencies.

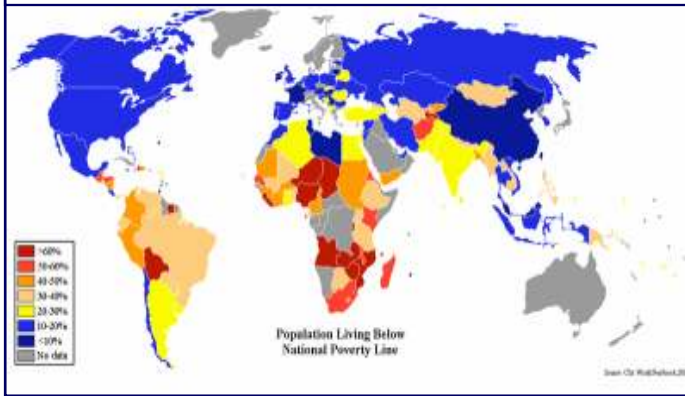
One of the major reasons for this apparent disparity is that there are several determinants of nutritional status other than just access to food and satiety of hunger. While undernutrition is a major underlying factor in a substantial proportion of under-5 deaths, improved access to and utilization of health care can dramatically reduce under-5 mortality even in the absence of a concomitant reduction in undernutrition. Therefore, when inter-country and inter-regional comparisons are made, there is disparity between food insecurity measured in terms of food availability at national or household levels and food insecurity outcome indicators, namely, undernutrition rates, micronutrient deficiency rates and under-5 mortality rates.

The comparison between countries of the South East Asian Region (SEAR) with countries of sub-Saharan Africa (SSA) brings out the dichotomy between national and household food security on the one hand and under-5 undernutrition rates and under-5 mortality rates on the other. These issues are discussed in this article.

## Food Security

About one-fourth of the global population lives in countries of the South-East Asian Region (SEAR). All the countries in the region are undergoing socio-economic, demographic, nutrition and health transition. The Green Revolution had ensured that the increase in food production more than kept pace with the growth in population. The growth in the agricultural sector was doubly effective in reducing hunger because it not only ensured adequate food production but also improved the economic status of the rural poor who depend on agriculture and related activities for their livelihoods. Most

Figure 1 People living below poverty line



of the countries in the SEAR are currently self-sufficient in food production. Some of them export enough plantation crops to be able to import the needed food grains from neighbouring countries, which have a surplus.

A majority of the SEAR countries have experienced high GDP growth and have relatively low poverty rates (Figure 1). All the countries in the region, including those that did not have very high GDP growth rates, have put in place effective employment guarantee schemes to reduce unemployment rates and to improve the purchasing power of the vulnerable sections to access food. Public distribution systems supply cereals at subsidized rates to the poor, and hunger rates are quite low in SEAR countries (Figure 2). In the past two decades, hunger rates decreased from 23.7% to 13.9% in Asia and the Pacific region, and the number of hungry persons came down from 739 million to 563 million.

Countries in sub-Saharan Africa (SSA) have abundant natural resources and relatively low population density rates as compared to countries in the SEAR. But food production did not expand rapidly in these countries. Economic growth has been stagnant and poverty and hunger rates are high (Figure 1). The steep inflation in food prices 2007 onwards was a major threat to food security not only for the low-income groups but also for the low-

Figure 3 Under 5 undernutrition rates

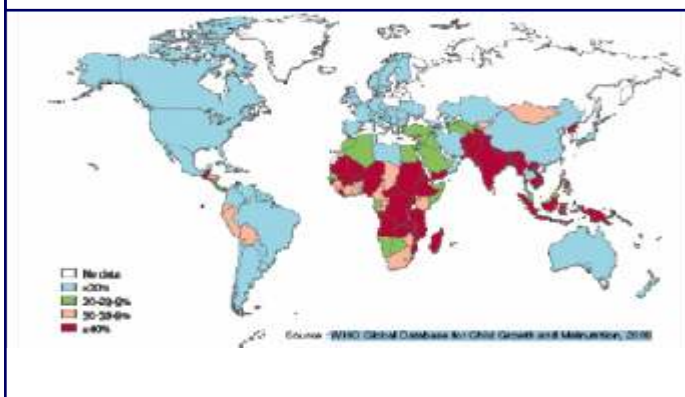
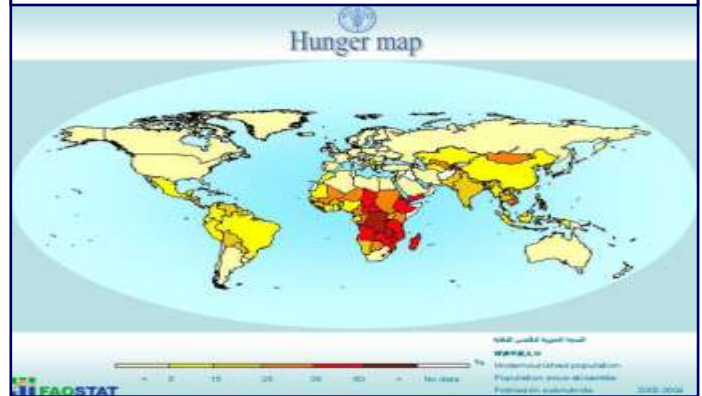


Figure 2 World hunger map



middle-income groups. As a result of all these adverse factors, the number of hungry persons in Africa grew over the period 1990-2012 from 175 million to 239 million, with nearly 20 million of these being added in the last four years of this period. In sub-Saharan Africa, the modest progress achieved upto 2007 was reversed. Since that year, hunger rates have been rising by ~2% per year (Figure 2).

### The South Asian Enigma

One of the most widely quoted examples of dichotomy between food insecurity per se and food insecurity outcomes is the so-called South Asian Enigma<sup>3</sup>. Countries of the SEAR have been by and large self-sufficient in food production for four decades and have had reasonably good economic growth. In spite of these advantages, child undernutrition rates continue to be high (Figure 3). Child underweight rates in South Asia are similar to those in sub-Saharan Africa; but food insecurity is widespread in sub-Saharan Africa whereas it is relatively low in the SEAR. Therefore, it is not food insecurity per se that is responsible for the similarity observed in underweight rates.

There are substantial differences between Africa and SEAR as regards birth weights and lengths of infants; the prevalence of low birth weight in Africa is only half of that in

Figure 4 Under -5 mortality rates (1990 & 2009)

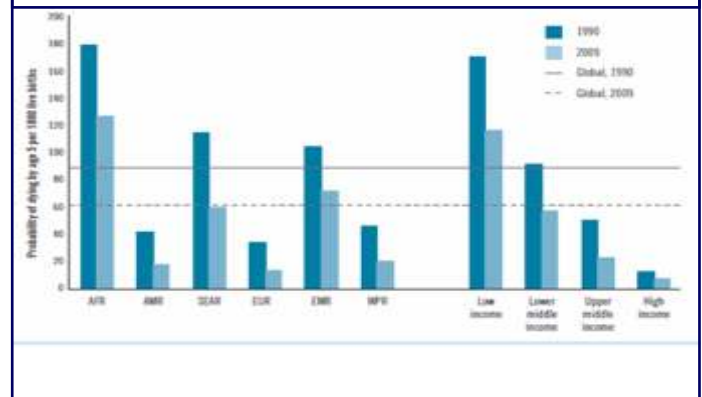


Figure 5 Undernutrition rates in adults

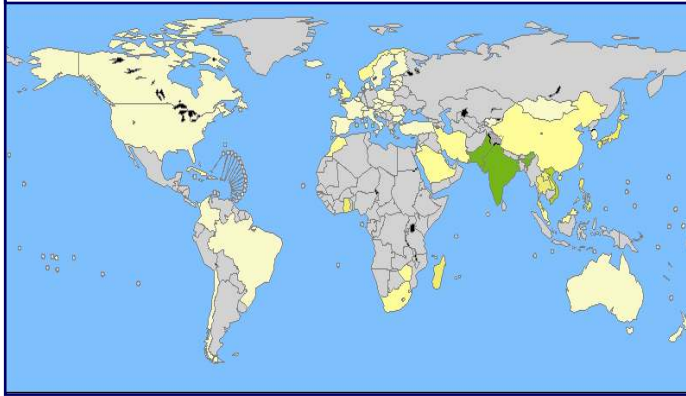
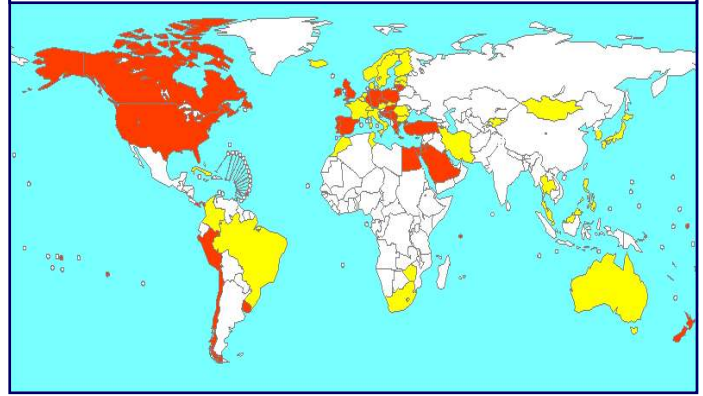


Figure 6 Overnutrition rates in adults



the SEAR. It is well known that birth weight is a major determinant of growth, not only during infancy and early childhood but also throughout life. The large differences in birth weights and lengths of newborns appear to be the major determinants of the substantial differences in the rates of stunting and underweight between children in sub-Saharan Africa and India, irrespective of the food security situation. Lower paternal and maternal heights as well as low birth weight are factors that might be responsible for the high rates of underweight in children in South Asian countries whereas food insecurity is the dominant reason for the high rates of underweight in SSA.

A second component of the South Asian Enigma is the paradox of under-5 mortality rates in these two regions. The under-5 mortality rates in different regions of the world are shown in Figure 4. In spite of the fact that the underweight rates in children in South Asia and sub-Saharan Africa are similar, the under-5 mortality rates in sub-Saharan Africa are nearly double those of the South Asian countries. Part of the difference is undoubtedly due to better access to health care in the South Asian countries. However, there are other equally important factors responsible for the difference in under-5 mortality rates. These include:

- the difference in the proportion of preterm vs term small-for-date infants. A majority of the low-birth-weight infants in SSA are preterm while a majority of those in India are term babies with intrauterine growth retardation.
- the difference in the type of care required in the neonatal period: intensive care is required for survival of pre-term babies in SSA; only essential newborn care is needed to improve the survival of the mature small Indian baby. It might be worthwhile to explore whether parameters other than under-5 mortality and under-5 underweight rate for instance, low BMI for age (wasting rates) in preschool children, are more closely related to food insecurity across regions and countries. If so, they may be used as indicators of food insecurity outcome.

### Emergence of dual nutrition burden

While persistent undernutrition remains a public health problem (Figure 5) in both the SEAR and SSA, the slow but steady increase in overnutrition and obesity during the last decade is a matter of concern. In some segments of the population, such as the urban affluent, high intake of energy-rich foodstuffs is mainly responsible for the rising overnutrition rates. In other segments of the population, the steep reduction in physical activity due to increased mechanization of transport and of occupational and household activity domains is the major factor. There is persuasive evidence to show that under-nourished stunted children are at higher risk of becoming over-nourished adults and thereby face a higher risk of developing non-communicable diseases: this represents a dual nutrition burden in the same individual.

National surveys in India have shown that, within the same family, there are under- and over-nourished individuals. This suggests that poverty is not the single most important determinant of undernutrition in India. Low birth weight, incorrect feeding practices for infants and young children, inadequate environmental sanitation, and insufficient access to health care are some of the other important causative factors associated with child undernutrition; food preferences and life styles in adults are important determinants of overnutrition. Under these circumstances, the country has to invest time and money not only in steps to improve household food security but also in screening young infants and children for growth faltering and undernutrition, and in providing appropriate health and nutrition counseling and care. It is important to note that both in the SEAR and SSA, overnutrition rates are relatively low (Figure 6), and that the majority of persons in the community are normally nourished (Figure 7). It is essential to ensure that efforts are made to reduce undernutrition rates, prevent rise in overnutrition rates and protect and promote normal nutrition.

Figure 7 Normally nourished adults

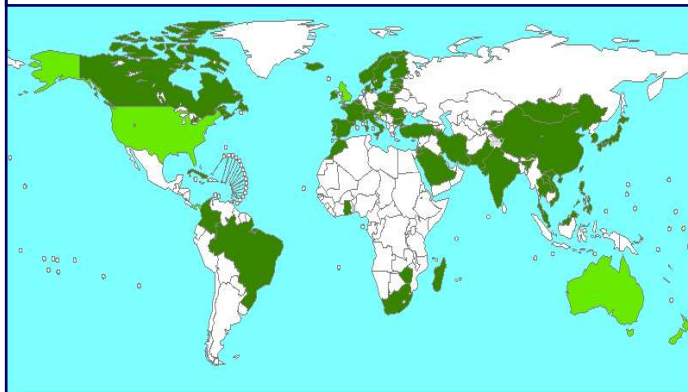
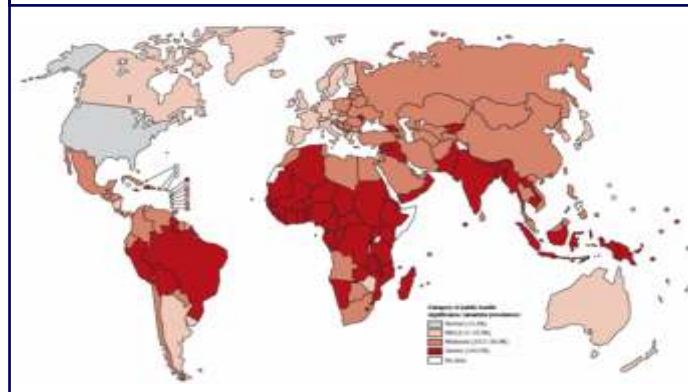


Figure 8 Prevalence of anaemia in preschool children



## Summary and conclusions

The data presented indicate that there are different dimensions to food security within a region or country. Self-sufficiency in food production is a prerequisite to food security, especially, in large countries like India and will always remain an important indicator. GDP growth and poverty reduction are the other two indicators that are used to assess a country's progress towards food security. Many countries have social safety net programmes that provide subsidised food grains to vulnerable segments of the population; these may serve as useful indices to assess household food security.

The hunger rate, defined as "not having two square meals a day" is readily obtainable, and has been widely used to assess food security. While this might have been an appropriate indicator some decades ago, its validity has to be re-assessed in the current context when the consumption of inexpensive calorie-dense food is a driving force behind the emerging dual nutrition burden, even among the poor.

Rates of stunting and underweight have been widely used as indicators of undernutrition in children. Food insecurity is certainly one of the causes of stunting and underweight in preschool children, but it is not the only cause. Some of the other important causes of stunting and underweight are parental short stature, low birthweight, and poor feeding practices of infants and young children; none of these factors may be associated with current household food insecurity. Given the large inter-country differences in height from childhood to adult life, it has been suggested that wasting (assessed in terms of BMI-for-age), which is an indicator for current food inadequacy, might be a better indicator of food insecurity. The usefulness of BMI-for-age as an indicator of food insecurity has to be assessed country-wise.

Undernutrition is the underlying factor in a substantial proportion of under-5 mortality; however, access to

appropriate health services can result in a substantial reduction in under-5 mortality rates, even in undernourished children. In view of the substantial differences between countries with regard to access to appropriate health care, under-5 mortality may not be a useful indicator for making inter-country comparisons of food insecurity.

The lead article in the current issue documents the magnitude and health consequences of micronutrient deficiencies. While undernutrition is due to insufficient quantity of food consumed, micronutrient deficiencies reflect the poor quality of food consumed. Micronutrient deficiencies, especially, anaemia is widely prevalent in most developing countries (Figure 8). Prevalence of anaemia is high not only among undernourished persons but also in normal and overnourished individuals—dual nutrition burden in the same individual. Micronutrient deficiencies referred to as "hidden hunger" are the most common nutritional problems in the world affecting a third of global population but have not been included among the indicators of food insecurity outcome.

It is essential to revisit and improve the indicators used for assessment of food insecurity outcomes, so that progress in efforts to improve food and nutrition security to combat triple burden of undernutrition, micronutrient deficiencies and overnutrition, can be monitored more effectively.

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