

Malnutrition

India is one of the fastest growing countries in terms of population and economy, sitting at a population of 1,139,96 million (2009) and growing at 1-4% annually (from 2001-2007). India's economy is growing where its GDP growth is 9% from 2007 to 2008; since independence in 1947, its economic status has been classified as a low-income country with majority of the population at or below the poverty line. Though most of the population is still living below the national poverty line, its economic growth indicates new opportunities and a movement towards increase in the prevalence of chronic disease which is observed in at high rates in developed countries such as United States, Canada and Australia. Malnutrition is an ecological problem that does not occur alone. Poverty, disturbed family structure, ignorance and despair are some important factors responsible for malnutrition. Although the need for dietary supplements is important, the problem of malnutrition is larger than diet alone. Malnutrition is so often found enmeshed in the circumstances of a deprived environment that is impossible to eradicate it completely without sustainable social and economic reform.

Malnutrition is a condition of impaired development or function caused by either a long-term deficiency or an excess in energy and/or nutrient intake, the latter representing the state of over nutrition. When food supplies are low and the population is large, under nutrition is common, leading to nutritional deficiency diseases, such as goiter and xerophthalmia. However, when the food supply is ample or overabundant, in-correct food choices coupled with an excessive intake can lead to over nutrition related chronic diseases, such as a certain form of diabetes. Freedom from hunger and malnutrition is a basic human right and their alleviation is a fundamental prerequisite for human and national development. WHO has traditionally focused on the vast magnitude of the many forms of nutritional deficiency, along with their associated mortality and morbidity in infants, young children and mother. However, the world is also seeing a dramatic increase in other forms of malnutrition characterized by obesity and the long-term implications of unbalanced dietary and lifestyle practices that result in chronic disease such as cardiovascular disease, cancer and diabetes. Hunger is the physiological state that results when not enough food is eaten to meet energy needs. It also describes an uneasiness, discomfort, weakness, or pain caused by lack of food. If hunger is not relieved, the resulting medical and social costs from under nutrition are high—preterm births and mental retardation, inadequate growth and development in childhood, poor school performance, and decreased work output in adulthood, and chronic disease. Symptoms of chronic hunger are found not only among people in the developing world but also among many people living at or below the poverty level.

The World Bank estimates that India is ranked 2nd in the world of the number of children suffering from malnutrition, after Bangladesh (1998), where 47% of the children exhibit a degree of malnutrition. The prevalence of underweight children in India is among the highest in the world, and is nearly double that of Sub-Saharan Africa with dire consequences for mortality, morbidity, productivity and economic growth. The UN estimates that 2.1 million Indian children die before reaching the age of 5 year - four every minute—mostly from preventable illness such as diarrhoea, typhoid, malaria, measles and pneumonia. Every day, 1000 Indian children die because of diarrhoea alone. According to the 1991 census, India has around 150

million children, constituting 17.5% of India's population, who are below the age of 6 years.

For India and much of the third world, nutrition status is characterized by varying degrees of under nutrition for women and children. Both over nutrition and under nutrition affect energy metabolism, with overnutrition raising energy expenditure and under nutrition lowering it. Fever is a powerful stimulator of thermogenesis. In diseases such as cancer, AIDS, diabetes mellitus, and rheumatoid arthritis, whether energy expenditure is increased or decreased often depends on how advanced the disorder is. Early on, when the greater protein turnover characteristic of these conditions is paramount, energy expenditure is increased. In addition, in diseases such as cancer, AIDS, and rheumatoid in which cytokines are released, the cytokines' thermogenic effect initially increases the metabolic rate. However, as the disease becomes more advanced and leads to cachexia, energy expenditure drops below normal. Acute conditions such as burns and trauma significantly raise energy expenditure, primarily by increasing sympathetic response and the release of catecholamines, which are powerful stimulators of energy expenditure.

Nutrition is the science of foods, the nutrients and other substances therein, their action, interaction and balance in relationship to health and disease; the processes by which the organism ingest, digest, absorbs, transports and utilises nutrients and disposes of their end products. It is a major factor in bringing out the maximum potentiality that one is endowed with both physically and mentally. Good nutrition depends on an adequate food supply and this in turn on a sound agricultural policy and a good system of food distribution. The social, cultural, economic and agricultural factors are the basic etiological factors causing nutritional disease and they are closely linked with excessive increase in the population. The combination of people living in poverty and the recent economic growth of India has led to the co-emergence of two types of malnutrition : under nutrition and over nutrition. The implications of both over nutrition and under nutrition indicate that a country can exert rates of infectious disease and chronic disease simultaneously : A situation that has not been observed before in history. This new phenomenon of the rising incidence of chronic diseases such as heart disease, cancer and Type II diabetes along with the presence of infectious diseases such as pneumonia, and tuberculosis is mainly attributed to rapid population growth and the increase in the country's economy. The increase in income has made it possible for people living in urban areas to have access to a wider range of food outlets, to social costs from under nutrition are high—preterm births and mental retardation, inadequate growth and development in childhood, poor school performance, decreased work output in adulthood, and chronic disease. Symptoms of chronic hunger are found not only among people in the developing world but also among many people living at or below the poverty level.

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1. Under Nutrition resulting in :

- * Protein Energy Malnutrition (PEM)
 - * Iron deficiency
 - * Iodine deficiency
 - * Vitamin deficiency
 - * Low birth weight children
2. Seasonal dimensions of Nutrition
 3. Natural calamities and the landless.
 4. Market distortion and disinformation
 5. Urbanization
 6. Special nutritional problems of hill people, industrial workers, migrant workers, and other special categories
 7. Problems of over nutrition, overweight and obesity for a small section of urban population.

The combination of people living in poverty and the recent economic growth of India has led to the co-emergence of two types of malnutrition–

* **Under nutrition**

Under nutrition is the most common form of malnutrition among the poor in both developing and developed countries. It is also the primary cause of specific nutrient deficiencies that can result in muscle wasting, blindness from xerophthalmia, scurvy, pellagra, beri-beri, anaemia, rickets, goitre, and a host of other problems. According to the World Food Programme and the M. S. Swaminathan Research Foundation (MSSRF), over the past decade there has been a decrease in stunting among children in rural India, but inadequate calorie intake and chronic energy deficiency levels remain steady. Under nutrition is known to have a negative effect not only on the physical dimensions of the body resulting in stunted stature and low weight, arm circumferences, etc., but its adverse influence is also evident in various biochemical and physiological functions of the body including the structure and function of the brain. Nutritional deprivation during intrauterine life in human beings is reported to be associated with reduced spontaneous activity, altered reflexes and altered sleep patterns in the new born which even extended over the period of infancy. Follow-up studies of such infants in developing countries to determine the long-term impacts of these changes are few and the results inconsistent and conflicting. Various studies in developed countries however, have shown that there is a deficit in mental performance associated with low birth weight. Being raised in an upper socio-economic environment seemed to compensate for deficit in mental performance. Although childhood malnutrition has been found to be associated with smaller head circumferences and altered brain biochemistry, the functional significance of these changes is not clearly understood. Results of tests of intellectual ability administered to malnourished children did show that severe energy-protein inadequacy experienced during early childhood can lead to irreversible impairment of mental function in later life.

The most critical micronutrients missing from diet worldwide are iron deficient. It is estimated that 20 million people worldwide have sustained brain damage from preventable maternal iodine deficiency. And more than 350,000 children develop blindness from xerophthalmia each year. This vitamin deficiency also raises the risk for other diseases, such as measles. The United Nations International Children's Fund reports that the lives of one to three million children could be saved annually in the developing world if vitamin A supplements were provided a few times a year. Of the 5.7 billion people in the world, up to 2 billion may be affected by some form of micronutrient malnutrition. Delhi and disease from infections, particularly those

causing acute and prolonged diarrhoea or acute respiratory disease, increase dramatically when the infections are superimposed on the state of chronic under nutrition. Diarrhoea alone is the number one killer of children in developing countries, responsible for 23% of deaths of children under 5 years of age.

Protein–energy malnutrition (PEM) is a form of under nutrition caused by an extremely deficient intake of energy or protein generally accompanied by an illness. Genetic background contributes to both forms of malnutrition. Under nutrition in the developing world is also tied to poverty, and any true solution must address this problem. However, these countries have a multitude of problems so complex and interrelated that they cannot be treated separately. The following major obstacles challenge those seeking a solution :

- * Extreme imbalances in the food/population ratio in different regions of a country
- * War and political/civil unrest
- * The rapid depletion of natural resources
- * Cultural attitudes towards certain foods
- * Poor infrastructure, especially poor housing, sanitation and storage facilities, education, communications and transport systems