MARUDHAR KESARI JAIN COLLEGE FOR WOMEN, VANIYAMBADI

PG AND RESEARCH DEPARTMENT OF FOODS AND NUTRITION

CLASS : III.B.SC NUTRITION FSM & DIETETICS

SUBJECT CODE : CNU53

SUBJECT NAME : COMMUNITY NUTRITION

SYLLABUS

UNIT - I

Nutrition and Health in National Development. Concept of Community, Types of Community, Factors affecting the health of community. Malnutrition - Etiology, symptoms, Prevalence of malnutrition, factors contributing to malnutrition - Under nutrition and Over nutrition, balance between food and population growth.

UNIT 1 CONCEPT OF PUBLIC NUTRITION

Structure

1.1 Introduction

1.2 Understanding the Terms: Nutrition, Health and Public Nutrition

1.3 Public Nutrition

- 1.3.1 Concept
- 1.3.2 Scope
- 1.3.3 Future Projections

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- 1.4.1 Concept of Health Care
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1.1 INTRODUCTION

The rapidly changing global trends in the area of food consumption patterns, lifestyles and environment have a tremendous impact on the nutrition and health profiles of the communities. Though today's consumer is much better informed about various issues relating to his health, the information explosion also adds to the confusion in making the right choices and staying clear of misinformation and misconceptions. Therein, emerges the need for professionals with sound knowledge to ensure proper nutrition and positive health of the people they serve. This need is being felt more acutely in the current health scenario prevailing all over the world, though the specific issues may vary from country to country.

In this unit, we will learn about concept of public nutrition. We would learn as to what public nutrition is all about and why do we want to study it? We will begin by explaining certain terms used in the area of public nutrition. We will also learn about the concept and essential component of health care and its delivery. This will help us to understand the role of public nutritionist in health care delivery.

Objectives

After studying this unit, you will be able to:

- define the terms nutrition, health and public nutrition,
- discuss the concept of public nutrition, its scope and future projections,
- explain the concept of health care and the three different levels at which it is available to the community,
- describe the health system as it operates in India,
- describe primary health care and the various components of primary health care, and
- define the role of the public nutritionist in health care delivery.

1.2 UNDERSTANDING THE TERMS: NUTRITION, HEALTH AND PUBLIC NUTRITION

You must have used the terms nutrition and health often in your daily life, though not so often the term "public nutrition". You might be wondering why we want to learn about these terms. However, before we study the course of public nutrition in detail, it is important for us to gain a good understanding of these terms - nutrition, health and public nutrition in a scientific way. Let us start with the term Nutrition.

- **Nutrition**

You must have studied about the concept of nutrition in the Advance Nutrition Course (MFN-004). We will just review it here. Nutrition may be defined as *the science of food and its relationship to health*. It is concerned primarily with the part played by nutrients in body growth, development and maintenance. Good nutrition means, "maintaining a nutritional status that enables us to grow well and enjoy good health." The subject of nutrition is very extensive. Since our concern is with community aspects of nutrition, it is paramount to understand the other two terms i.e., health and public nutrition. Let us try to understand what health means.

- **Health**

The most widely accepted definition of health is the one given by WHO (1948) in the preamble to its constitution. Box 1 gives the WHO definition of health.

Box 1	WHO Definition of Health
It states "Health is a state of complete physical, mental and social well being and not merely an absence of disease or infirmity."	

You should also note that this WHO definition has recently been expanded and includes "the ability to lead a socially and economically productive life". However, this concept of health is considered idealistic by many people and by using this yardstick very few, if any, would qualify as being healthy. But, if people consciously follow this goal, then it would enable most people to achieve a more positive state of health. In the absence of a better way of defining health, this definition of health continues to have universal acceptance.

Let us now go over to the term public nutrition.

- **Public Nutrition**

Public nutrition is concerned with improving nutrition in populations in both poor and industrialized countries, linking with community and public health nutrition and complementary disciplines.

You would note that public nutrition is an applied and very vast field. It includes many activities as follows:

- an understanding and a raising awareness of the nature, causes and consequences of nutrition problems in society,
- epidemiology, including monitoring, surveillance and evaluation,
- nutritional requirements and dietary guidelines for populations,
- programmes and interventions: their design, planning, management and evaluation,
- community nutrition and community-based programmes,
- public education, especially nutrition education for behavioural change,

- timely warning and prevention and mitigation of emergencies, including the use of emergency food aid,
- advocacy and linkage with, for example, population and environmental concerns, and
- public policies and programmes relevant to nutrition in several sectors, for example, economic development, health, agriculture and education.

So we saw that public nutrition is a very vast field and has many aspects to it. We will now study in detail about the concept, scope of public nutrition and the future projections of this field.

1.3 PUBLIC NUTRITION

You must have heard of various study areas like"public health nutrition", "community nutrition" and "international nutrition" The concept of public nutrition is already established under these study areas, so then why do we want to have a separate course of study. We want to do this so that we develop clarity on our objectives and action and be effective in improving the nutrition situation of the population. Let us start with the concept of public nutrition.

1.3.1 Concept

It is widely quoted among applied nutrition professionals that "*nutrition is not a discipline to be studied; it is a problem to be solved.*" If this is true, then by definition, solving nutrition problems requires multidisciplinary cooperation. The study of nutrition crosses boundaries from the most basic of laboratory sciences to an understanding of global, economic and political interactions among nations. It is important for you to understand that nutrition problems in developing, as well as, developed countries cannot be solved in the laboratory or clinic alone. The constraints to populations achieving nutritional health fall in the economic, social, cultural and behavioural realms. Some of these are: the lack of access to food, its inappropriate distribution among and within households, and maladaptive food and health practices. The skills and knowledge needed to help address these constraints are quite different from those of the laboratory scientist or the medical practitioner. They require a different kind of training from that associated with the science of nutrition.

In a 1996 letter to *The American Journal of Clinical Nutrition*, *Mason* and others suggested the name "public nutrition" to define a new field encompassing the range of factors known to influence nutrition in populations, including diet and health, social, cultural, and behavioural factors and the economic and political context. The suggestion was based on the perception that the field already exists *de facto*, but that its recognition as a legitimate field of study would allow education and professional development to be more explicitly focused on its objectives. Like public health, public nutrition would focus on problem-solving in a real-world setting, making it, by definition, an applied field of study whose success is measured in terms of effectiveness in improving nutritional conditions.

The recognition that nutrition solutions often lie outside the domain of "nutrition" *per se* is not new. More recent approaches have been based on the assumption that nutrition problems will be solved by incorporating nutrition concerns into a wide variety of disciplines as they are translated into action, for example, when consumption issues are integrated into agriculture policies. This approach is correct if it can be made to work, but it is dangerous because nutrition then risks being the responsibility of no one. Putting nutrition under the domain of health, then it tends to medicalize the field, while putting it under agriculture may marginalize it. We need to remember that public nutrition has a distinct identity, incorporating the relevant aspects of the variety of disciplines that bear on the nutrition problem, as well as, incorporating scientific advances

in the understanding of nutritional problems. Thus we saw that although public nutrition is recognized as a separate field of study, it does incorporate some elements of other disciplines which contribute to understanding of nutritional problems.

Let us now look at the scope of public nutrition.

1.3.2 Scope

Nutritional status is important as a determinant and correlate of health status and as a marker of individual welfare, in addition to being an outcome in its own right. A consequence of emphasizing nutrition as the focus of a programme and policy specialization may be that solutions then are too often linked to food, failing to integrate health concerns such as immunization, environmental sanitation, disease prevention and treatment, on the one hand, and poverty alleviation, entitlement and empowerment, on the other. Even in the area of food, many of the region's major food distribution programmes are not viewed primarily as nutrition programmes by those who run them, but as welfare or entitlement programmes.

This raises the question of whether the appropriate field of concentration is one of *nutrition* policies and programmes (public nutrition), or whether it would be better simply to add a nutrition focus to professional training in public health, economics, political science, or other relevant fields. The field of public nutrition is unique in requiring at least some understanding of the entire range of determinants of nutritional outcomes.

The study of these basic determinants extends into areas of economics, agricultural policy, health science and policy, and the social sciences, as well as, public policy and management. We need a multidisciplinary approach to solve nutrition problems. Figure 1.1 shows that we need to improve agriculture, education, community development and health to solve nutrition problems. However, we all tend to stay in our own boxes and thus confined to our area of specialty.

Agriculturalists assume the solution lies in the food supply, medical professionals assume the solution lies in health care or supplementation, nutritionists may assume the solution lies in nutrition education or in food supplements. In any given case, any of these might be appropriate solutions, but the field requires an empirical outlook to assess the entire range of possible interventions and policy responses. A basic but thorough understanding of human nutrition and of the nutritional aspects of food, is also viewed as germane to address nutrition policies and programme.

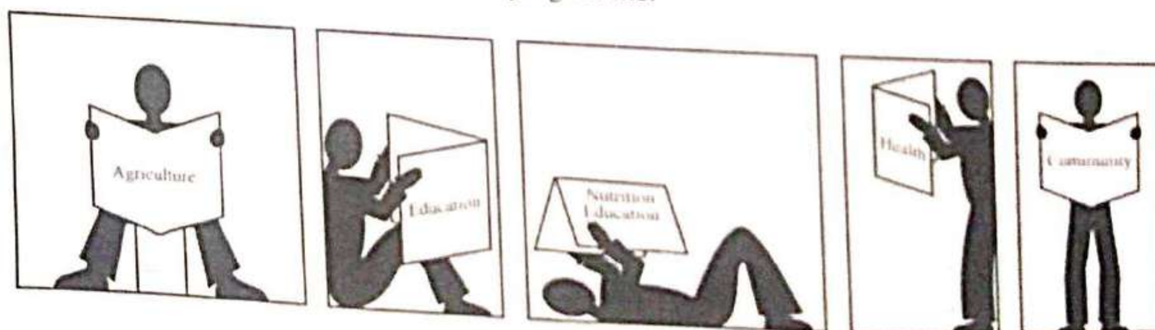

Figure 1.1 : Public nutrition: the need for cross disciplinary breadth in understanding nutritional problems

We should have a systematic introduction to the range of programmes and policies that have affected nutrition in various settings. This introduction should cover design and implementation issues, specific resource needs, and the conditions under which various programmes have been found to be more or less effective. Included in this introduction must not be only nutrition programmes, such as maternal and child health supplementary feeding, school meals, and nutrition education, but also areas outside nutrition, such as public health and environmental sanitation, household food and livelihood security, and food marketing. These programmes should be presented for their direct relevance and

to illustrate forcefully the point that nutrition solutions range well beyond the areas typically defined as nutrition. A great deal of knowledge has been developed through problem analysis, programme evaluations and cost effectiveness studies; this is clearly an important knowledge base of the public nutrition.

The two areas most commonly identified as important to public nutrition were economics and behavioural science. Public nutrition as an applied field, need not focus on econometric analysis or broad economic theory, but on some principles of economics as it applies to households (the household as a production and consumption unit, determinants of intra-household allocation, the value of time, the role of incomes, income sources, and local prices in determining household food security). Some concepts of political economy - the political forces underlying the economic and social conditions that relate to the nutritional situation - are generally held to be central to effectiveness in the field. Understanding the social context of nutrition problems implies knowing the behavioural and cultural factors that can, directly and indirectly, affect the nutritional situation of a community (and, more broadly, the country).

Thus, we realize that public nutrition is a very wide field. As a public nutritionist, we require an understanding of many non nutritional determinants of nutritional outcomes, in order to solve nutritional problems of population. We also need to have a knowledge and understanding of programmes and policies which influence nutritional outcomes. These programmes are both nutritional and non nutritional i.e. education, economics etc. in focus.

Let us now study the future projections in the area of public nutrition.

1.3.3 Future Projections

We discussed earlier that the field of public nutrition has existed for a long time, although not by this name. A heterogeneous network of professionals with distinct training and career paths, working in applied nutrition programmes and policy, continues to shape the field, incrementally, through dedication and effort. Although the need for a continuing supply of such persons, albeit with more targeted and appropriate training, is acknowledged widely, funding for the preparation of such individuals is increasingly scarce. A comprehensive effort in public nutrition would need to address appropriate training to a critical mass of key individuals at each level of a country. Such a programme could achieve significant improvement in nutrition and create the human and institutional capabilities to sustain positive nutritional gains well into the twenty-first century.

The appropriate training of applied nutrition professionals to work at the programme and policy levels hence, needs to be supported and recognized. Organizations prepared to fund this set of training activities will play a significant role in enhancing institutional effectiveness, strengthen regional capacity for providing ongoing human resource development, and contribute to the establishment of sustainable training programmes.

Thus, we can appreciate that, as the field of public nutrition gains increasing recognition, there are more and more opportunities for professionals in the applied field to publish and disseminate their work in the academic community. There are journals devoted to food policy and programmes and nutrition journals now commonly contain sections devoted to the policy and programme applications of nutrition science.

Check Your Progress Exercise 1

1. Define public nutrition.

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2. Comment on the statement "Public nutrition: The need for cross disciplinary breadth in understanding nutritional problems."

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In the next section, we would now learn that nutrition is an essential component of health care, so it is essential for us to learn what health care means. We will also learn how health care is delivered in our country and what is the role of public nutritionist in health care delivery. Let us begin with health care.

1.4 HEALTH CARE

Earlier in this unit, we learnt about the concept of health and what we understand by being in good health. Now we would learn about importance of imparting good health to people. We will study about concept of health care, levels of health care, primary health care and how health care is delivered in India.

Let us start with the concept of health care.

1.4.1 Concept of Health Care

We are aware of the fact that health is a fundamental human right. Thus, it becomes imperative for the State to assume responsibility for the health of its people. In order to achieve this objective, national governments globally are engaged in providing adequate health care to their people. Further, there are continuing efforts to improve these services.

Box 2 gives the definition of health care.

Box 2	Definition of Health Care
	Health care involves much more than just medical care and can be defined as " multitude of services provided to individuals or communities by agents of health services or professions, for the purpose of promoting, maintaining, monitoring or restoring health."

Medical care, which is by and large seen as the dispensation of services by physicians themselves or rendered at their instructions, thus becomes a part of the total health care services. Health care services are usually delivered at three levels. These are primary care, secondary care and tertiary care levels.

Let us review each of these levels in detail.

1.4.2 Levels of Health Care

It is customary to describe health care services at three levels. i.e. primary, secondary and tertiary.

Primary level care

This is the first level of contact of an individual, the family and the community with the national health system. It is possible to deal with most of the health problems of the community effectively at this level. In India, these services are provided through a network of Primary Health Centres (PHCs) and their Sub Centres (SCs) spread all over the country. The functionaries involved in dispensing these services include the multipurpose health workers, village health guides and trained birth attendants (TBAs or Dais).

Secondary level care

More complex health problems of the community are resolved at the secondary level care through the district hospitals and the Community Health Centres. The latter are upgraded Primary Health Centres, which provide a variety of specialist facilities at the Block level. The Community Health Centres also act as the *first referral level*. This implies that patients can be directed to the next level of health care facility without first going to the district level hospital.

Tertiary level care

This is the highest level of health care available to the community for dealing with their most complex health problems, which cannot be solved at the primary and secondary level. The institutions involved in providing the requisite facilities and care include Medical College Hospitals, All India Institutes, Regional Hospitals, Specialized Hospitals and other Apex Institutions. These institutions have highly specialized health personnel who dispense these services.

Figure 1.2 shows three levels of health care. First level-Primary health care includes promotive, preventive and basic curative health services, second level includes general hospital services and third level at tertiary health care includes specialized hospital services.

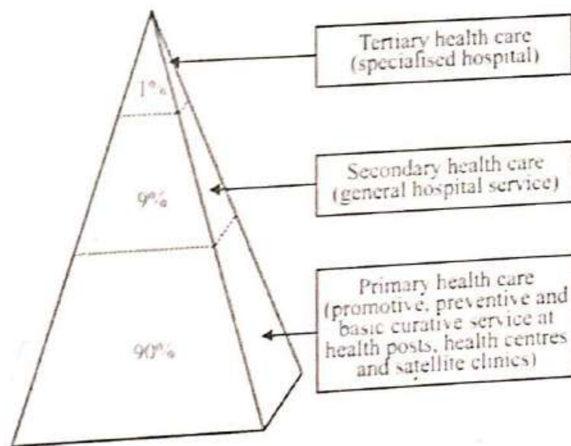

Figure 1.2: Levels of Health Care

Since there are many people in this world, especially in the developing countries, who do not have access to adequate and quality primary health care, the concept of primary health care has received world wide attention. We will now study about the concept of primary health care and its essential components as discussed during the international conference on Primary Health Care held at Alma Ata, USSR, 1978.

1.4.3 Primary Health Care

The international conference on Primary Health Care held at Alma Ata, USSR, 1978, focused universal attention on the concept of primary health care as the most effective means of achieving an acceptable level of health for maximum number of people in the community. It has been defined as: "*Essential health care based on practical, scientifically sound and socially acceptable methods and technology made universally accessible to individuals and family in the community through their full participation and at a cost that the community and the country can afford to maintain at every stage of their development in the spirit of self determination*".

Thus, defined, primary health care becomes a practical approach to provide essential health care at affordable cost to all the members of the community with their full participation. The basic tenets of primary health care rest on equitable distribution of resources, intersectoral coordination, appropriate technology and community participation. Though all factors are responsible for successful implementation of primary health care activities, community participation is perhaps the crucial determinant of success of any developmental programme. It is the process by which

individuals and families assume responsibility for their own health and welfare and for those of the community and develop the capacity to contribute to their and the community's development. The declaration of Alma Ata conference on primary health care is highlighted in Box 3.

Box 3	Declaration of Alma Conference

The declaration of Alma Ata stated that primary health care includes at least:

- Education about prevailing health problems and methods of preventing and controlling them.
- Promotion of food supply and proper nutrition.
- An adequate supply of safe water and basic sanitation.
- Maternal and child health care, including family planning.
- Prevention and control of endemic diseases.
- Appropriate treatment of common diseases and injuries, and
- Provision of essential drugs.

As you may have read in the declaration, individual countries could add on more services to this list, but this is the minimum basic health care to be provided to the population. Indian government has pledged itself to provide primary health care to its people by signing the Alma Ata Declaration.

Figure 1.3 gives essential components of primary health care and restates that the goal of primary health care is to provide comprehensive services to actual needs and priorities of the communities at an affordable prices. Immunization, adequate medical care, supply of water and adequate sanitation, educate people about the prevailing health problems, production of food, supply and proper nutrition are some of the components of primary health care as highlighted in Figure 1.3.

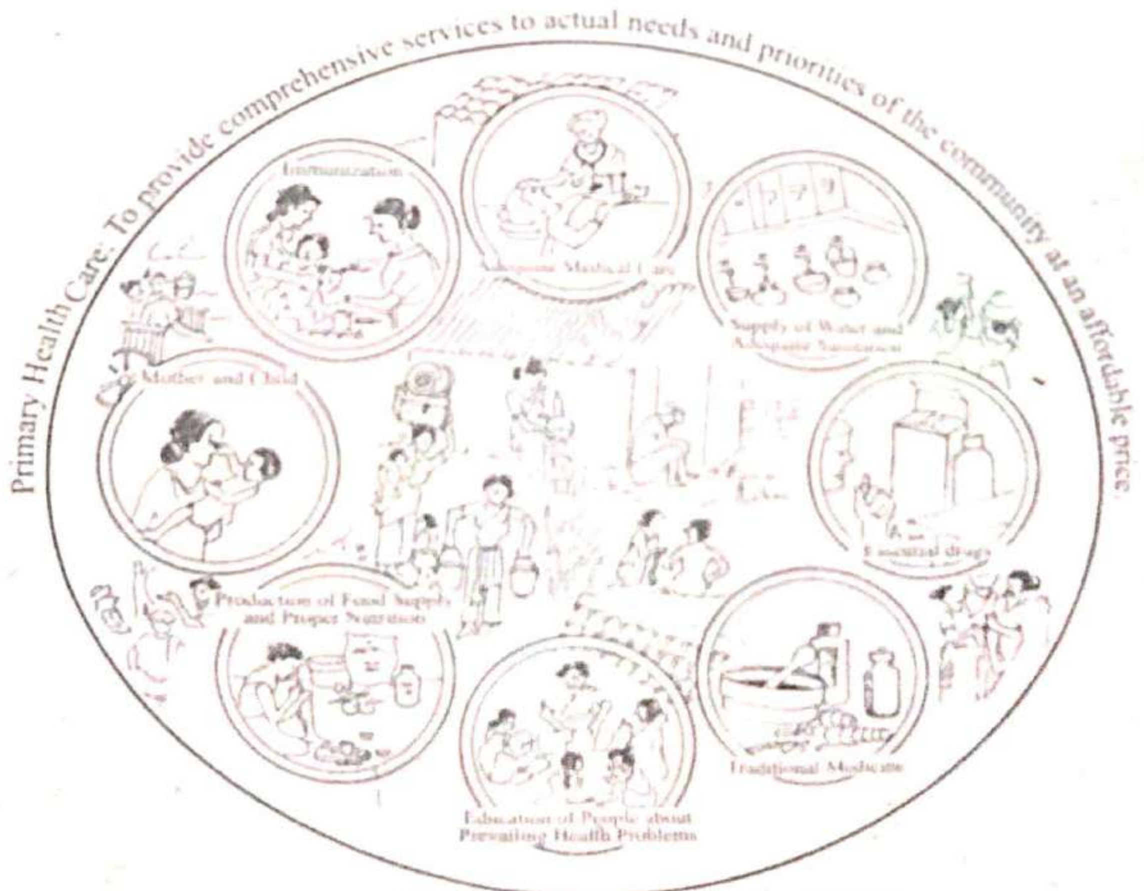

Figure 1.3: Easential components of primary health care

Now that we know, what health care means, it is important for us to know how health care is delivered in our country. Read the next sub-section and find out.

1.4.4 Health Care Delivery

The challenge that exists today in many countries is to reach the whole population with adequate health care services and to ensure their utilization. Rising costs in the maintenance of large hospitals and their failure to meet the total health needs of the community have led many countries to seek alternative models of health care delivery with a view to provide health care services that are reasonably inexpensive and have the basic essentials required by the population.

Let us learn about the health system in India.

The Health System in India

The country is divided into 28 states and 7 union territories for the purpose of administration. These are further divided into smaller administrative units called the *districts*, which are 593 in number at present. Within the districts are many smaller demarcated units. One of them is the *community development block* of which there are about 6000 in the country. Figure 1.4 gives administrative division of India around which the health system is based.

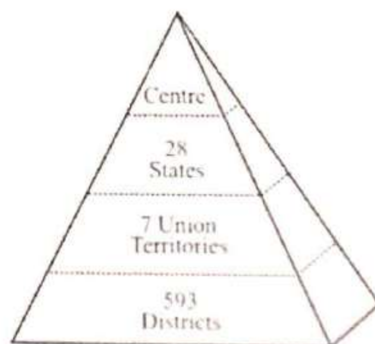

Figure 1.4: Administrative division of India

The main links in the health system comprise the Centre, State, District, Block and the village. Since, health is a state subject in India, the states have a considerable amount of independence in the delivery of health services to their people. Thus, each state has developed its own system of health care delivery. The centre is responsible for policy making, planning, guiding, assisting, evaluating and coordinating the work of State Health Ministries. Thus, it ensures universal coverage of the country with health services.

Let us review the health system at each of the following links - Centre, State, District Block, Subcentre and Village.

Let us start with the Centre.

A. Health System at the Centre

At the national or centre level the health system comprises:

- Union Ministry of Health and Family Welfare
- The Directorate General of Health Services
- The Central Council of Health

igure 1.5 gives the organs of health system at Central level. It shows three main organs of health system as listed above. In addition, it shows that Directorate General of Health Services has 3 Bureaus - namely Bureau of Health Planning, Central Bureau of Health Intelligence and Central Education Bureau.

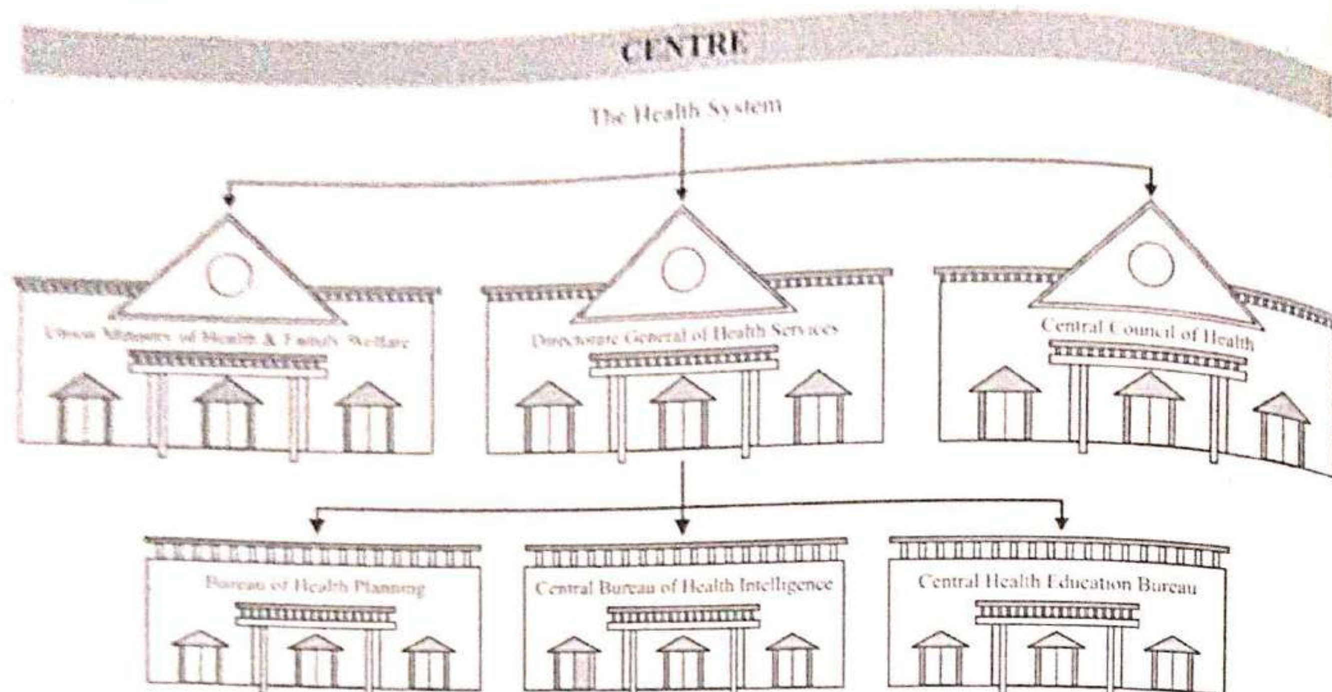

Figure 1.5: Organs of health system at central level

Let us look at each of these organs in detail, next.

- ***Union ministry of Health and Family Welfare*** is headed by a Cabinet Minister and a Minister of State, which are political appointments. The minister is assisted by the Secretary in the Department of Health and Family Welfare and the Special Secretary, Family Welfare. The functions of the Ministry include those which are mentioned in the Union List as the sole responsibility of the Centre as well as those mentioned in the Concurrent List which are the joint responsibility of both the centre and the states.

- ***The Director General (DG) of Health Services*** acts as the principle advisor to the Union Government in all matters pertaining to medical and public health area. Two additional Director Generals and several Deputy Director Generals assist the DG in performing the various tasks. Further, the Directorate has three Bureaus namely - Bureau of Health Planning, Central Bureau of Health Intelligence and Central Health Education Bureau, which have specified roles.

- ***Central Council of Health*** comprises all the State Health Ministers under the Chairmanship of the Union Health Minister.

Let us move on to the state level.

B. Health System at the State Level

Like the Centre, Minister of Health and Family Welfare is head of the Ministry and the Secretary in the Ministry is the bureaucratic head. The State Health Directorate, likewise has a Director of Health Services who is the Chief Technical Advisor to the State Government on all matters pertaining to health. All states also have a Family Planning Bureau, which is instrumental in the implementation of the family welfare programme. In addition, there are many specific health prograr which come under the state health directorate. Figure 1.6 gives organization services at state level. Some of the specific programmes which come Health Directorate are malaria, tuberculosis, leprosy, blindness control, imm and medical care.

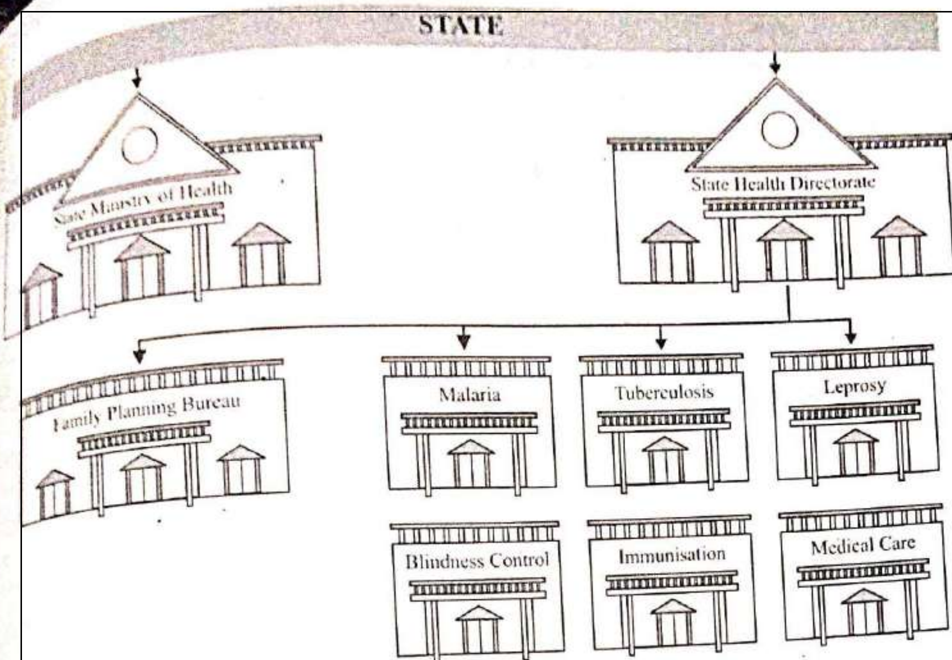

Figure 1.6: Organization of health services at state level

Let us now move on to the district level.

C. *District Level of Health System*

There are six types of administrative areas, namely - sub divisions, *tehsils*, community development blocks, municipalities and corporations, villages and *panchayats* in a district. The subdivision and tehsils are progressive divisions of a district where the *tehsil* may comprise 200-600 villages. The rural areas are also divided into community development blocks which comprise approximately 100 villages with about 80,000 to 1,20,000 population.

Each district has an administration head as a Collector. Most districts are divided into two or more sub divisions each in charge of an Assistant Collector or Sub Collector. The office of the Chief Medical Officer (CMO) of a district serves as the nerve centre to integrate all state financed health activities in the rural areas. The CMO is assisted by a "Superintendent for the District Hospital, a District Health Officer, a District Family Planning Officer and others in the field of malaria, T.B, leprosy, school health etc. However, there is no uniform pattern and this may vary from state to state. Figure 1.7 gives general organization of health services at district level and shows collector being the head administrator.

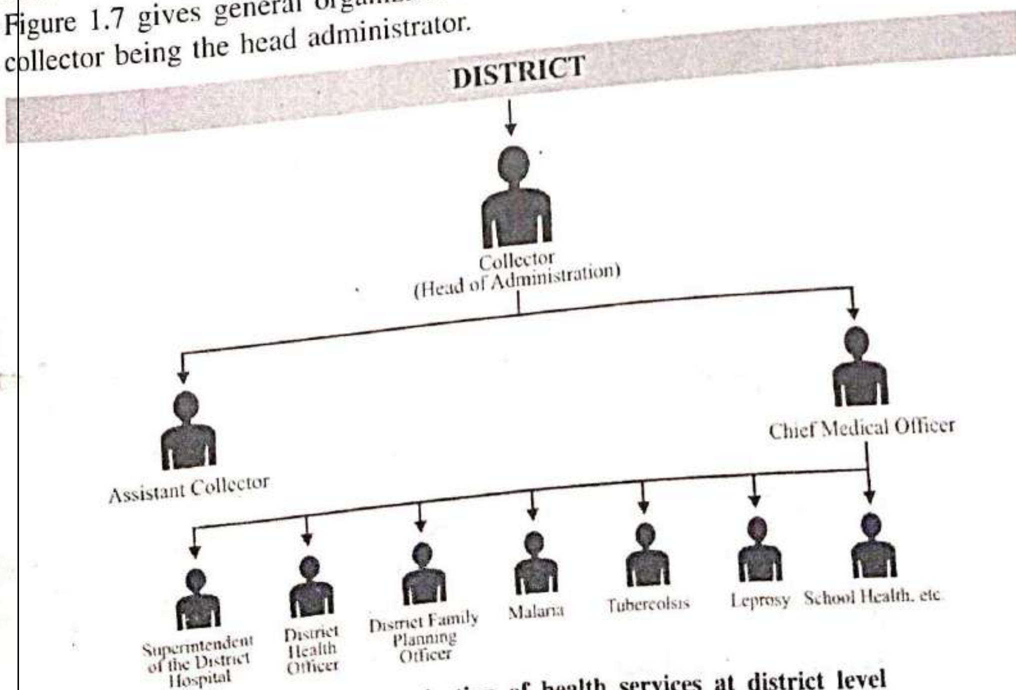

Figure 1.7: Organization of health services at district level

Figure 1.11 shows Health service delivery system in India. It shows linkages between various functionaries and health institutions at various levels within the state.

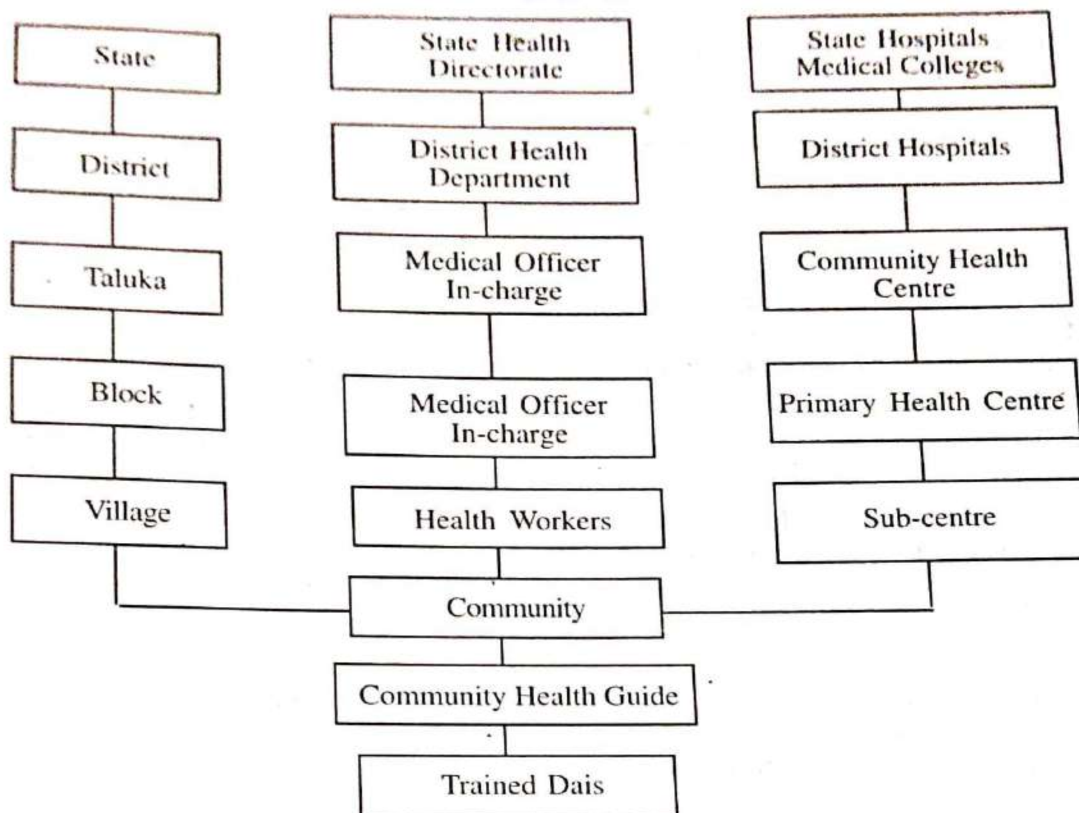

Figure 1.11: Health service delivery system in india

We can conclude that government of India tries to ensure universal coverage of helath services for all with special focus on vulnerable population.

We have learnt about the concept and scope of public nutrition and we also learnt about health care and its delivery system in India. You might be wondering about the role of public nutritionist in health care delivery. We will find out about it in the next section.

1.5 ROLE OF PUBLIC NUTRITIONIST IN HEALTH CARE DELIVERY

It is clearly evident from the foregoing discussion that nutrition is an important, though not the only, determinant of health of an individual. The root cause of many health problems of the community can be traced to faulty nutrition. It could be a *lack, excess* or an *imbalance* of certain nutrients in the diet, which compromises the nutritional status leading to health problems. Hence, nutrition can be viewed as a subset of the set, health. Since, attainment of health for all is a universal goal of all nations and communities, public nutrition has to be an integral part of any strategy designed to achieve this goal. As signatory to the Alma Ata declaration, primary health care becomes the major approach to achieve an acceptable level of health for maximum number of people in the community. It has already been stated that the promotion of food supply and proper nutrition is one of the eight basic essential services included in the primary health care. Thus, we can conclude that public nutrition is an essential component of health and health care.

The continuing changes in the health scenario of nations across the world present varied and newer challenges to the public nutrition professional who is intimately

involved with providing nutrition support in all health care activities. The shift in accent on health promotion from the earlier one primarily on prevention and cure has added more responsibilities to all those engaged in health care of the community. Today, much of the ill health is related to lifestyle and environmental factors whereas a lot of the illness could be attributed to the causation of germs when the first movement for public health began. Though the latter has been contained in the developed and less successfully in the developing nations, the former situation continues to be of concern in the public health arena. The public nutritionist equipped with the knowledge of food, nutrition and health is eminently suited to participate in all the strategies of health promotion required to combat this situation. In the Indian context, where undernutrition is extensively present in the preschool children and pregnant and nursing mothers on the one hand and the threat from lifestyle related health diseases like obesity and degenerative heart diseases show alarming trends on the other, the role of public nutritionist assumes tremendous importance along with responsibility. A public nutritionist can perform the following:

- In the hospital-based set up, she is a part of the team delivering therapeutic and rehabilitative services to the patient. She is responsible for food service management, nutritional care of the patients including diet counseling and imparting nutrition education to various categories of medical personnel. The Directorate General of Health Services has recommended the appointment of at least an assistant dietitian for every 100 bed hospital with progressive increase in their numbers as the hospital beds increase.
- There is a role for the public nutritionist in the national health set up at the centre as the Nutrition Advisor and Research Officer. At the State level, they can function as the State Nutrition Officers.
- The public nutritionist can make a significant contribution in all the programmes of development undertaken by voluntary, non-government organizations.
- At the international level organizations like WHO, FAO and UNICEF provide opportunities for public nutritionists at the policy making, planning and implementation stages.

From the discussions above, you must have realized that public nutritionist can perform wide variety of functions ranging from health promotion, curative services to advocacy and programme planning. So are you ready to take on this role! This course in Public Nutrition will equip you with the necessary knowledge and skills to function as effective public nutritionist.

Check Your Progress Exercise 2

1. Explain the concept of health care and the three different levels at which it is available to the community.

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2. List the essential components of primary health care.

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- describe the influence of agricultural and horticultural production, storage, distribution and science and technology on food consumption and nutritional status of the population,
- explain food and nutrition security and the underlying economic and social conditions as related to food security, and
- define food behaviour and describe the social, cultural and psychological determinants of food behaviour.

2.2 MULTIPLE CAUSES OF PUBLIC NUTRITION PROBLEMS

We read in Unit 1 that the field of public nutrition is unique in requiring at least some understanding of the entire range of determinants of nutritional outcomes. To clearly understand what causes nutrition problems, it is necessary to consider the operation and interaction of various determinants of malnutrition at different levels in society. The food – health – care conceptual framework portraying causal factors and their interaction is depicted in Figure 2.1. Figure 2.1 shows causes of malnutrition at three levels - immediate causes, underlying causes and basic causes. Immediate causes exist at individual level, while underlying and basic causes exist at family and societal level, respectively. The multisectoral nature of malnutrition becomes obvious when we look at the underlying causes. These causes are numerous and usually interrelated. The exact causes can be identified only in a particular context. To simplify the analysis these may be grouped into three main clusters: basic health services and a healthy environment, household food security, and maternal and child care. Most underlying causes are themselves the result of unequal distribution of resources in society. This disparity has to be analyzed, understood and acted upon. Causes at this level are the basic or structural causes.

OUTCOMES	Malnutrition, disability and death
Immediate Causes at Individual Level	1) Inadequate dietary intake 2) Disease
Underlying Causes at Household/ Family Level	1) Insufficient access to FOOD 2) Inadequate maternal and child CARING practices 3) Poor water/sanitation and inadequate HEALTH services 4) Inadequate and/or in appropriate knowledge and discriminatory attitudes limit household access to actual resources
Basic Causes in Society	1) Quantity and quality of actual resources – human, economic and organizational and the way they are controlled 2) Political, cultural, religious, economic and social systems including status of women, limit the use of potential resources 3) Potential resources : environment, technology, people

Adapted from UNICEF (1998) The State of World's Children 1998.Oxford University Press

Figure 2.1: Causes of Malnutrition – A Conceptual Framework

The study of these basic determinants extends into areas of economics, agricultural policy, health science and policy, and the social sciences, as well as public policy and management. So it is obvious that there are multiple determinants of nutritional problems and accordingly we need to adopt a multidisciplinary approach to solve the public nutrition problems. We will now study about the multidisciplinary approaches to solve nutritional problems.

5.2 HEALTH ECONOMICS

Health economics concentrates on application of the principles and rules of economics in the sphere of health. In broad terms, it includes *analysis and evaluation of health policy and the health system from an economic perspective*. In particular, it includes *health system planning, market mechanisms, demand and supply of health care, economic evaluation of individual diagnostic and therapeutic procedures, determinants of health and its evaluation, and evaluation of the performance of health care systems in terms of equity and efficiency*. The process involves calculating the cost incurred to tackle the problem and the consequences, which arise because of the problem. A decision is then taken in where to invest so that maximum benefits are achieved with the existing resources. In general the costs and consequences from a health perspective are given in Table 5.1. It shows various *direct, indirect* and *tangible* costs involved in managing the problems. It also shows the consequences like morbidity, mortality and pain suffering as a result of the occurrence of problems.

Table 5.1: Cost of managing health problems and consequences

Cost of managing the health problems	Consequences of health problems
• Direct – Capital-land, building – Operating-staff, overheads • Indirect – Production loss – Transportation – Boarding & lodging • Intangible – Pain, Suffering, Grief	• Physical functioning – Morbidity, and Mortality – Disability • Resources use – Cost averted by health care system in the form of treatment – Productivity loss averted • Social and emotional functioning – Pain, Suffering, Grief • Changes in quality of life, • Friends and Family

Analysis and evaluation of health policy and system is important because it helps us to plan the targeting of health resources required for alleviating the problems. We already know that there are multiple causes of malnutrition, so just focusing on health resources will not help solve the problems. Since nutrition is a determinant of health, focus on food resources becomes very critical. We will discuss food resources in detail under nutrition economics in section 5.4 later. Now let us review the economics aspects of causes and consequences of malnutrition.

5.3 MALNUTRITION AND ITS ECONOMIC CONSEQUENCES

What is malnutrition? Malnutrition can be defined as a *pathological condition resulting from a relative or absolute deficiency or excess of one or more of the essential nutrients*. From a nutritional standpoint, the condition can fall under the following 4 categories as shown in Table 5.2. These categories are *undernutrition, overnutrition, imbalance of nutrients and specific deficiencies of nutrients.*

Table 5.2: Classification of malnutrition based on nutrient intake

S.No.	Type	Nutrient intake
1.	Undernutrition	Inadequate
2.	Overnutrition	Excess
3.	Imbalance	Disproportionate
4.	Specific deficiency	Relative or absolute lack of an individual nutrient

Let us now understand the causes of malnutrition before we explain the consequences of malnutrition. We have read about causes of malnutrition in Unit 3. We will recapitulate these now.

5.3.1 Causes of Malnutrition

You may recall studying about the causes of malnutrition earlier in Unit 2. The causes of malnutrition are classified as *immediate* (individual level), *underlying* (household or family level) and *basic* (societal level) causes as highlighted in Figure 5.1 whereby factors at one level influence other levels. Each of these factors is essential, but is not sufficient in itself to achieve nutrition security. One of the important factors, which act at the individual level, is the *socio-economic status*. Other factors at the individual and household level include availability or accessibility of food, poor knowledge about balanced diet etc. You would note here that poverty affects almost every factor acting at the individual level as shown in Figure 5.1. For example, you can see in Figure 5.1 that when people do not have enough money, they may not be able to purchase enough food for their families and/or access health services which leads to malnutrition. The problems at the societal level include that of educational status, performance of agricultural sector, policies related to food imports contributing to malnutrition.

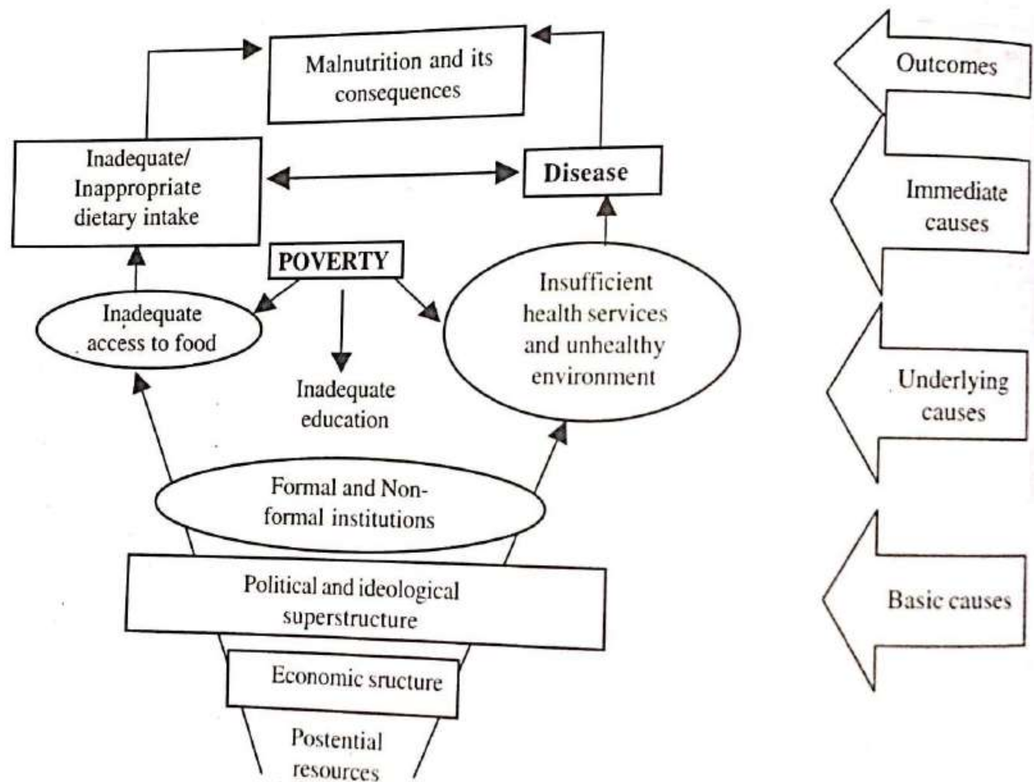

Figure 5.1: Malnutrition and its causes

You must have heard many times that cause of hunger is poverty. However, hunger also leads to poverty. So poverty and hunger have mutual cause and effect relationship. That is, poverty leads to hunger and hunger leads to poverty. Let us see how.

Poverty and hunger - mutually causes, devastating effects

Measures of food deprivation, nutrition and poverty are strongly correlated. Countries with a high prevalence of undernourishment also have high prevalence of stunted and underweight children. In these countries, a high percentage of the population lives in conditions of extreme poverty. In countries where a high proportion of the population is undernourished, a comparably high proportion struggles to survive on less than US$1 per day. While poverty is undoubtedly a cause of hunger, hunger can also be a cause of poverty. Hunger often deprives impoverished people of the one valuable resource they can call their own: the strength and skill to work productively. Numerous studies have confirmed that hunger seriously impairs the ability of the poor to develop their skills and reduces the productivity of their labour.

Hunger in childhood impairs mental and physical growth, crippling the capacity to learn and earn. Evidence from household food surveys in developing countries shows that adults with smaller and slighter body frames caused by undernourishment earn lower wages in jobs involving physical labour. Other studies have found that a 1 percent increase in the Body Mass Index (BMI, a measure of weight over height square) is associated with an increase of more than 2 percent in wages for those toward the lower end of the BMI range.

Micronutrient deficiencies can also reduce work capacity. Surveys suggest that iron deficiency anaemia reduces productivity of manual labourers by up to 17 percent. As a result, hungry and malnourished adults earn lower wages. And they are frequently unable to work as many hours or years as well-nourished people, as they fall sick more often and have shorter life spans. This then brings us to the issue of economic consequences of malnutrition. We have read about consequences of malnutrition in Unit 3. We will recapitulate this here and then study about economic consequences of malnutrition. Let us first recapitulate consequences of malnutrition.

5.3.2 Consequences of Malnutrition

Malnutrition manifests itself in terms of illness and death in all age groups. Children, pregnant women, nursing mothers and elderly are particularly vulnerable to the effects of malnutrition. Let us closely look at the effects of Malnutrition in children.

> *Malnutrition contributes to more than half of child deaths worldwide.*

Fifty-six percent of deaths among pre-school children in the developing world are due to the underlying effects of malnutrition on disease, but conventional methods of classifying deaths by cause have misleadingly attributed only about five percent of child deaths to malnutrition.

> ***The risk of death rises as the grade of malnourishment increases among children from mild to moderate to severely malnourished.***

It was previously thought that only severely malnourished children were at increased risk of dying, but recent studies show that even mild and moderately malnourished children are at increased risk of death because of their poor nutritional status. On an average, a child who is severely underweight is 8.4 times more likely to die from infectious diseases than a well-nourished child. Children who are moderately underweight and mildly underweight are 4.6 and 2.5 times, respectively more likely to die than well-nourished children. It is estimated that the vast majority (83%) of all malnutrition related deaths worldwide occur in children who are mildly and moderately underweight because of their total number. Programmes directed only at treating severe malnutrition, therefore, will have only a minor impact on child mortality rates.

> ***The synergistic contribution of malnutrition to child mortality is consistent across populations and can be estimated at the country level from weight-for-age prevalence data.***

Analysis show that the quantitative relationship between malnutrition and mortality is remarkably consistent across various populations representing diverse ecological, disease and cultural environments. The percentage of all malnutrition-related deaths that occur in mildly and moderately malnourished children can also be estimated from weight-for-age prevalence data.

As discussed earlier, malnutrition affects vulnerable population across all age groups. Table 5.3 summarizes consequences of malnutrition in the other vulnerable population like pregnant and lactating mothers adults and older adults.

Table 5.3: Consequences of malnutrition

Common nutritional disorders	Consequences
Pregnant and lactating mothers	
PEM, IDD, VAD, IDA, Folate deficiency, calcium deficiency.	Insufficient weight gain in pregnancy, Maternal anaemia, maternal mortality, Increased risk of infection, night blindness, Low birth weight leading to high risk of infant death
Intergenerational cycle	
PEM, IDD, VAD, IDA, Folate deficiency, calcium deficiency	Deficiencies passed on to the child who may then pass them on to the subsequent generation
Adults	
PEM, obesity, IDA and diet related diseases	Thinness, Lethargy, Obesity, Heart disease, Diabetes, cancer, hypertension Anaemia.
Elderly	
PEM, IDA, Obesity, osteoporosis, diet related diseases.	Obesity, diabetes, cancer, spine and hip fractures, anaemia and thinness.

The discussion above focussed on the consequences of malnutrition across pregnant and lactating women, children, adults and older adults. We may conclude that when people have illnesses as a result of malnutrition, it compromises on their work productivity. Let us now study effects of malnutrition on economic productivity of people or, in other words, economic consequences of malnutrition.

Economic consequences of malnutrition

Figure 5.2 explains the economic consequences of malnutrition. You would note from the Figure 5.2 that the economic productivity of the individual, influences the household income, which influences the household food availability and food allocation in the family. When household real income falls as a result of low economic productivity, families have less food available for different members of the families. Thus food consumption for the different members of the family falls. In our culture, it is mostly the women and the children who suffer the most as a result of poor availability of food at home compared with other members of the family. Poor food consumption contributes to low nutritional status of the family members especially the mother and the child. Mothers with poor nutritional status have low capacity to take care of the child. This insult to the child has long term consequences in terms of growth, cognitive capabilities, morbidities and mortality etc. This results in loss of productivity in school. For adults, poor nutritional status leads to reduced stamina and endurance and low physical capacity at work, thus contributing to reduce economic productivity. So this loss of productivity influences economic status of the family that can further deteriorate or prevent improvement of the nutritional status. This vicious cycle persists unless strong steps are taken to increase the household real income and improve the nutritional status.

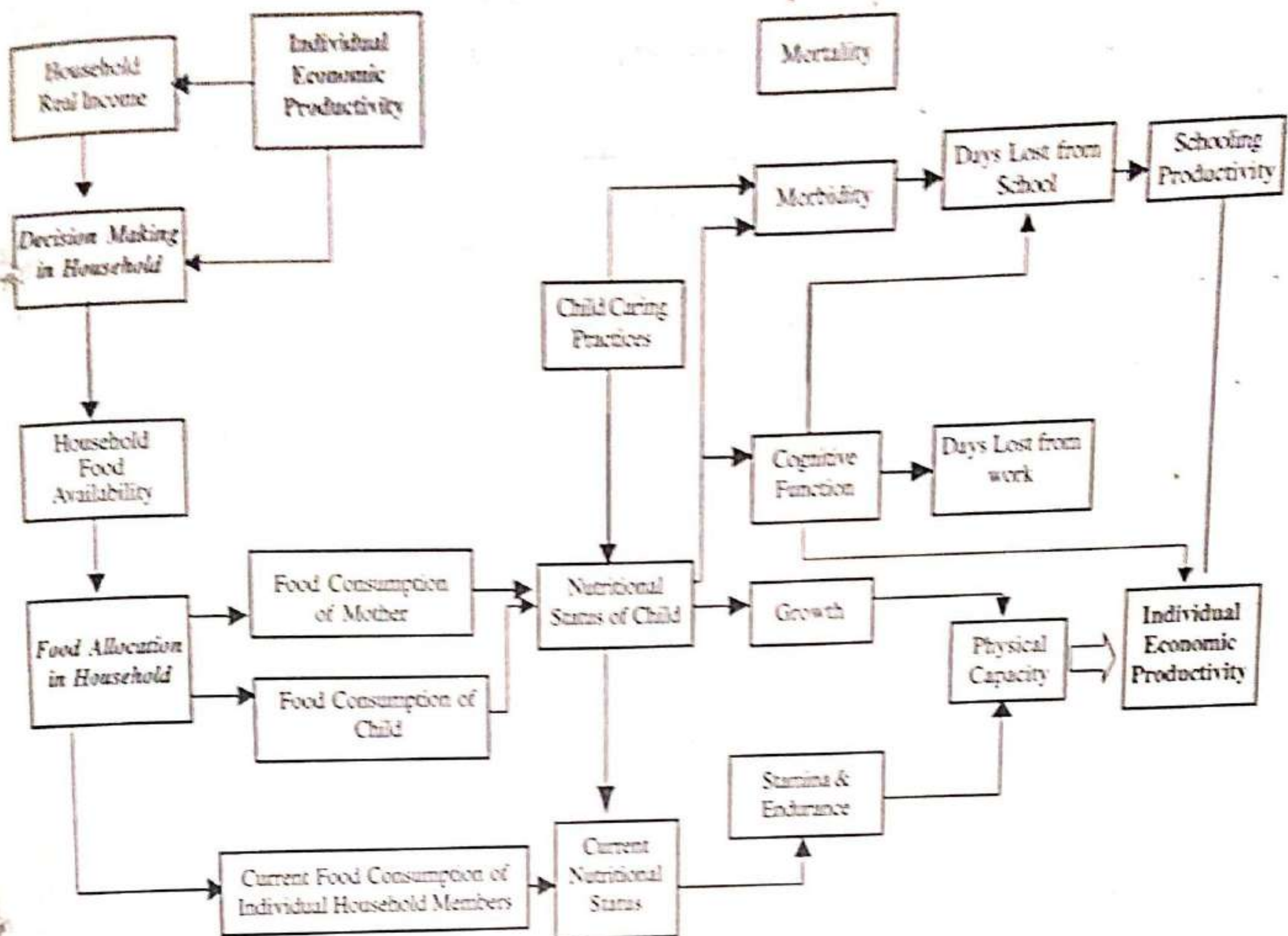

Figure 5.2: Economic consequences of malnutrition

We can now conclude that loss in the productivity of individuals lead to a loss in productivity of the nation as a whole and so nations cannot progress. This brings us to the issue that we need to assess and analyze the situation and plan and implement interventions to improve the nutrition situation. For doing this, we need to come up with some indicators which can help us track changes in the situation as we move towards our goals. We will now study about the "indicators" in detail.

5.3.3 Indicators of Nutrition

We will begin our study on this topic by first understanding what we mean by an indicator. An indicator is a *"specific and measurable statistical construct for monitoring progress towards a goal"*. Indicators are used to monitor a given characteristic (e.g. health status) of a population or to make comparisons with a different population or the same population at a different point in time. Indicators are therefore specific measures for assessing progress towards goals. The indicators may fall under the following categories:

1. *Macro* indicators for sector-wide monitoring and evaluation,
2. *Meso* indicators for regional or cross-agency policy monitoring and evaluation, and
3. *Micro* indicators for agency program monitoring and evaluation.

Figure 5.3 depicts the three types of indicators.

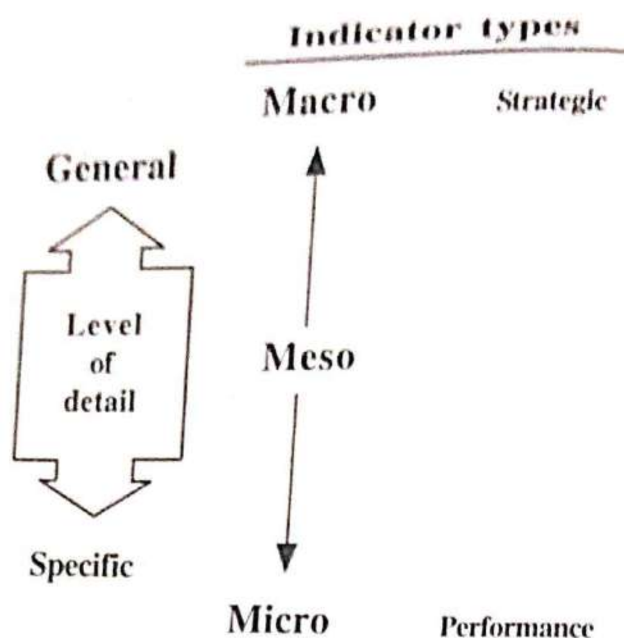

Figure 5.3: Types of indicators

As you may have noticed in Figure 5.3, the indicators may fall under three categories. Macro indicators are used at strategic levels while micro indicators are used at performance levels. From the previous sections it is clear that many factors contribute either directly or indirectly to the nutritional status of individuals. So choosing an indicator will depend on what we want to analyze. We can have indicators related to 1) government policies, 2) individual information on food/income etc, 3) food and nutrient intake 4) nutritional status, and 5) health status. A few of the indicators are enumerated below:

1. *Indicators related to Government policies*
   a. Nutrition policy
   b. Nutrition interventions: feeding programmes (e.g. school meals)
   c. Percent free school meals (eligibility, uptake): is this a marker of nutritional health or a marker of social or health inequalities?
   d. Food availability, e.g. foods stocked in shops used: range, availability
   e. Food accessibility
      i) Food prices, e.g. relative cost of healthier food, money for food, shopping capacity, domestic storage capacity etc.
   f. Food security -International and National
   g. Food stocks- e.g. amount of emergency food supplies
   h. Food subsidies
   i. Food budget standards defined
2. *Indicators at the individual level* : Number of individuals who have gone hungry through lack of personal food supply, amount of expenditure on food, percent of disposable income spent on food and cost of 1 kcal etc. are some of the indicators that can be used at individual level.
3. *Food and nutrient intake*
   a. Direct: national, regional, household and individual
   b. Dietary diversity (may be different within country compared with between countries)
   c. Food balance sheets

4. *Nutritional status*

   Biomarkers, Anthropometry and Energy balance

5. *Health status*

   a. Morbidity and mortality rates

   b. Macronutrients and micronutrient deficiencies

Having looked at some of the indicators, let us now review some of the interventions in malnutrition.

5.3.4 Interventions in Malnutrition and Government Expenditure on Interventions

We have studied about the causes of malnutrition at various levels. Similarly interventions for malnutrition should be carried out at various levels. There are several interventions aimed to reduce malnutrition. A detailed discussion on these interventions strategies is presented in Unit 12 later in this course. Here, we will familiarize you with some government programmes aimed to reduce malnutrition in vulnerable groups. Table 5.4 gives a list of various government programmes and their beneficiaries. Some of these have already been described in Unit 3 and 4 on nutritional problems. As you move on to Unit 10 later in this course, you will find that each of these programmes has specific goals and objectives for e.g. national nutritional anaemia control programme is aimed towards eliminating iron deficiency anaemia and so on.

Table 5.4: Programmes for control of malnutrition in India

Programme	Beneficiary
ICDS	Children 6 months – 6 years pregnant mothers + lactating women
National nutritional anaemia control program (NNACP)	Children 1-11 yrs Pregnant mothers + lactating women Family planning acceptor
National IDD control program	Entire population
National prophylaxis against nutritional blindness (VADCP)	Children 0-3 yrs
Mid Day Meal Programme	Primary school children
Targeted Public Distribution System	60 million poor families
Antyodaya Anna Yojana	10 million poorest BPL families
Annapurna Scheme	10 kg food grains per month free to senior citizens
Swarna Jayanthi Gram Swarozgar Yojana	Poor families above poverty line
*Jawahar Gram Samithi Yojana	Preference to S.C/S.T.,freed bonded labourers, parents of child labourers
*Employment Assurance Scheme	Rural poor, employment on demand during lean agricultural season
Food for Work Programme	8 drought affected states

** These programmes have now been merged into Sampurna Gramin Rozgar Yojana*