swasth hind

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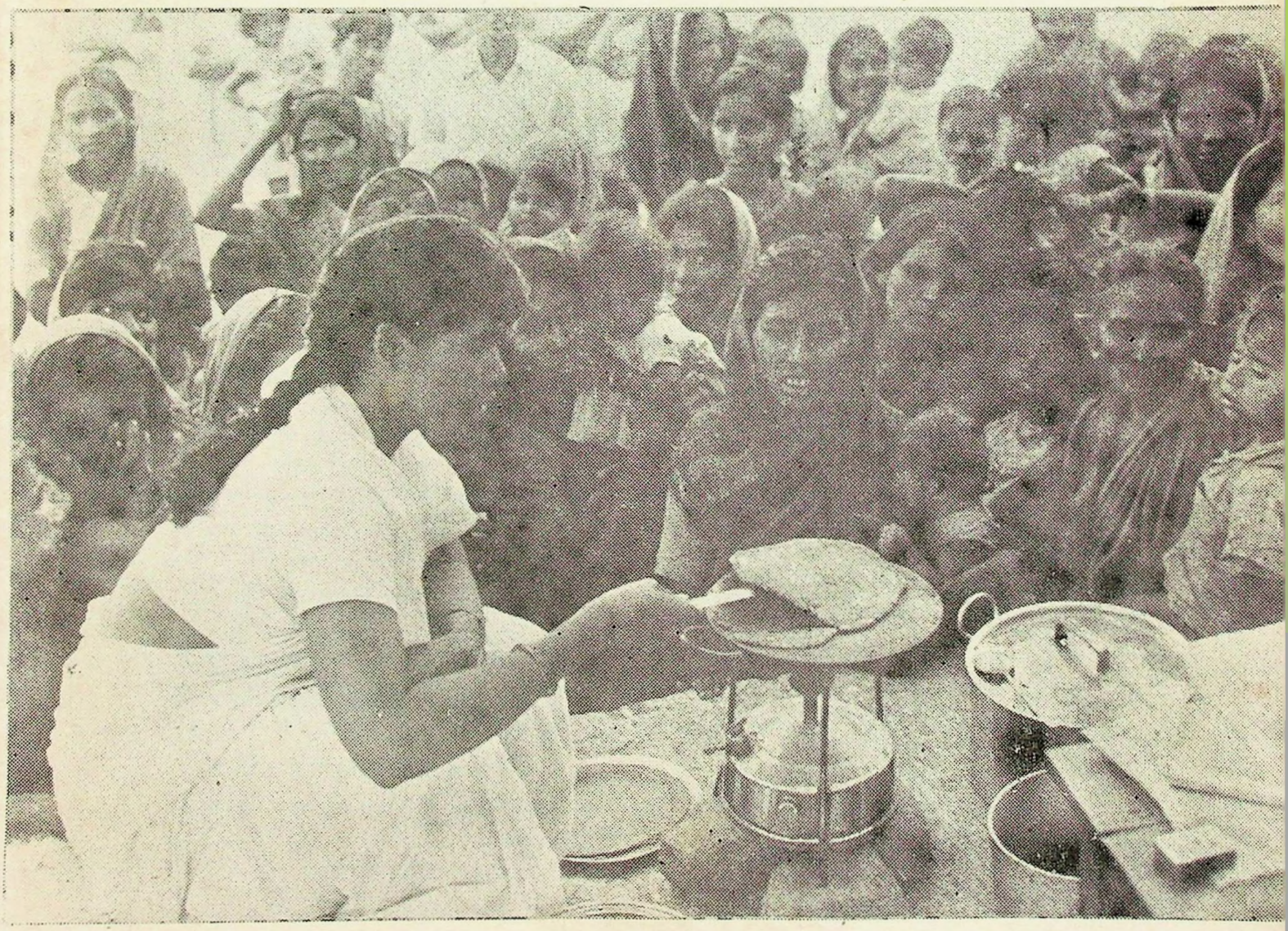

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OBJECTIVES

Swasth Hind (Healthy India) is a monthly journal published by the Central Health Education Bureau, Directorate General of Health Services, Ministry of Health and Family Welfare, Government of India, New Delhi. Some of its important objectives and aims are to:

REPORT and interpret the policies, plans, programmes and achievements of the Union Ministry of Health and Family Welfare.

ACT as a medium of exchange of information on health activities of the Central and State Health Organizations.

FOCUS attention on the major public health problems in India and to report on the latest trends in public health.

KEEP in touch with health and welfare workers and agencies in India and abroad.

REPORT on important seminars, conferences, discussions, etc., on health topics.

OUR COVER

In India, nearly 50 per cent of the total number of deaths occur among children under five years of age. The major underlying factor responsible for such a high child mortality rate is malnutrition. Malnutrition is also responsible for high mortality of mothers in our country.

Man's health and his social life are tied intimately and everlastingly to what he eats and how he eats it. October 16 is the World Food Day. *Our Cover* shows a nutrition worker giving a demonstration on balanced diet. [Photo PIB].

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Articles on health topics are invited for publication in this Journal.

State Health Directorates are requested to send in reports of their activities for publication.

The opinions expressed by the contributors are not necessarily those of the Government of India.

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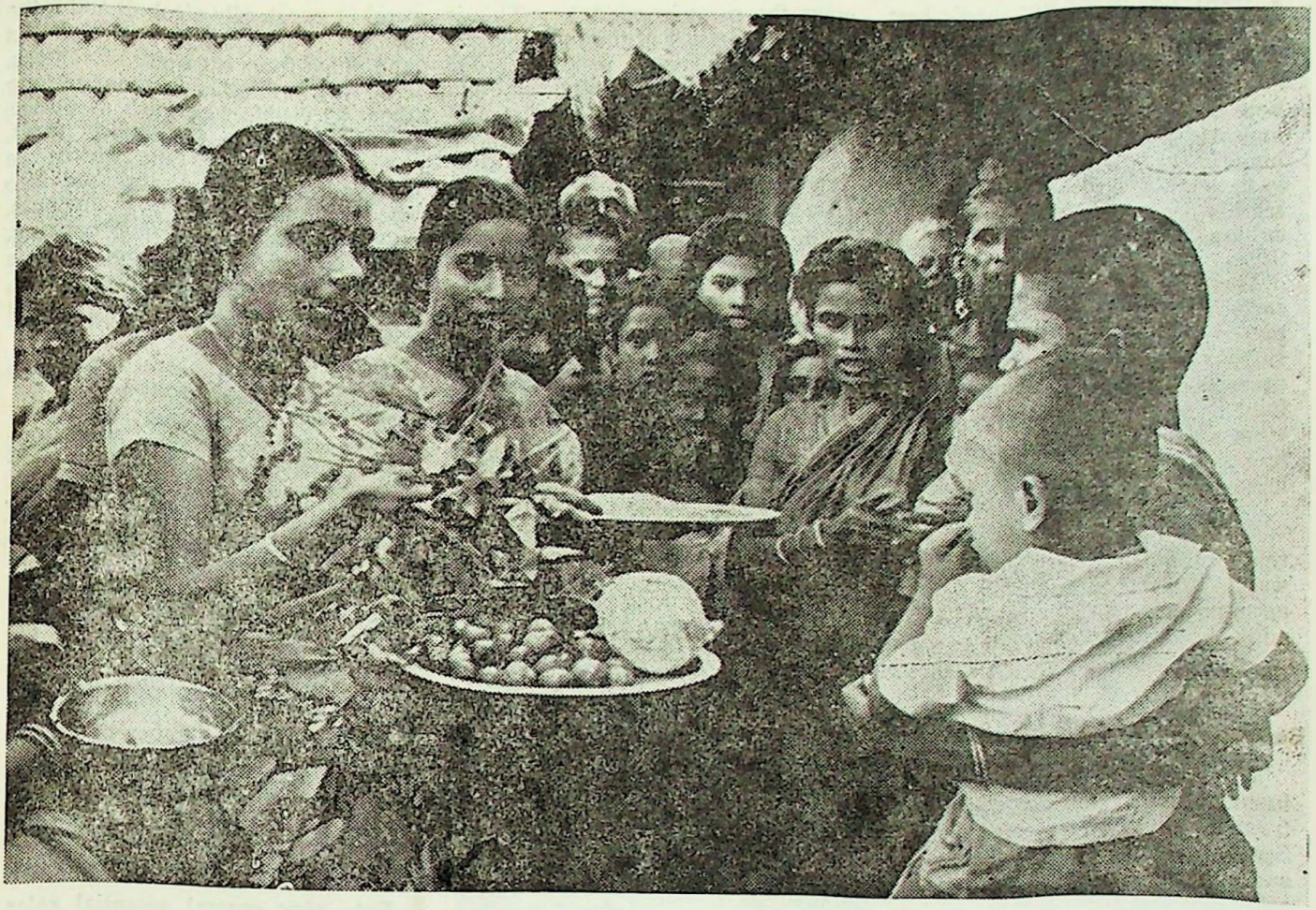


HUMAN NUTRITION: Food Energy Requirement And Malnourished Status

VINOD SINGH

Knowledge about food and its relationship to health is the best way to bring about a change towards appropriate eating patterns in adults and to introduce youngsters to good eating habits that should last a life-time.

Food and meals are man's best friends. His health and his social life are tied intimately and everlastingly to what he eats and how he eats it. Of all the physiological functions which maintain his life, eating and all that it entails is the one in which he most expresses his personal preferences and the cultural traditions of his ancestors.

Most people develop eating habits early in life that accord with family patterns and modify them only slightly over the years. Sometimes these habits conform to ideal food recommendations from the view point of maintaining and fostering good health. More often, however, they do not.

Knowledge about food, and its relationship to health is the best way to bring about a change towards appropriate eating patterns in adults and to introduce youngsters to good eating habits that should last a life time.

Basic Nutritional Requirements

The material for tissue cells in human beings during the period from conception to birth, comes from the food eaten by the mother and after birth, from what they eat.

In a somewhat over simplified way, a person can be compared with a working mecchanism such as a car. During growth and thereafter, the human cells must be repaired and replaced just as a car has new tyres, parts and paint from time to time. And like the car, the human has an engine—his muscular activity—which requires fuel. This fuel is provided by food in the form of calories.

In the humans the process by which food is used by the body is called metabolism. It begins with chemical processes in the gastro-intestinal tract which change plant and animal foods into less complex components so that they can be absorbed to fulfil their various functions in the body.

Proteins

Of the several essential components of food, protein is in many ways the most important. This is so because much of the body's structure is made up of proteins. For example, the typical 160 pound man is composed of about 100 pounds of water, 29 pounds of protein, 25 pounds of fat, five pounds of minerals, one pound of carbohydrates and less than one ounce of Vitamins. Since the muscles, heart, brain, lungs, and gastro-intestinal organs are made up largely of proteins, and since the protein in these organs is in constant need of replacement, its importance is obvious.

Chemically, proteins are mixtures of aminoacids which contain various elements including nitrogen. There are 20 different aminoacids that are needed for the body's protein needs. Eight of these must be provided in the diet, the rest can be synthesized by the body itself. The eight that must be provided in the diet are called essential aminoacids.

Meat, fish, eggs and milk or milk products are the primary protein foods and contain all of the necessary aminoacids. Grains and vegetables are partly made up of protein, but more often than not, they do not provide the whole range of aminoacids required for proper nourishment.

Carbohydrates

Carbohydrates are another essential food component. They are also called starches or sugars and are present in large quantities in grains, fruit and vegetables. They serve as the primary source of calories for muscle contraction and must be available in the body constantly for this purpose.

It takes one pound of carbohydrate to provide a 160 pound man with the fuel for about half a day. Therefore, if he is not getting new carbohydrate supplies during the day from his food, he will begin to convert his body fat or protein into sugar. This is not desirable unless he has an excess of body fat, and in any event, this also could not go on indefinitely.

Fats

Fats are a chemically complex food component composed of glycerol (a sweet, oily alcohol) and fatty acids. Fats exist in several forms and come from a variety of sources. One way to think of them is to group them as visible fats, such as butter, salad oil, or the fat seen in meat, and as invisible fats, which are mingled, blended, or absorbed into food, either naturally, as in nuts, meat, or fish, or during cooking. Another way is to think of them is as solid at room temperature (fat), or as liquid at room temperature (oils).

Saturated and Unsaturated

Fats are also classified as saturated or unsaturated. This is a chemical distinction based on the differences in molecular structure of different kinds of fat. If the carbon atoms in a fat molecule are surrounded or boxed in by hydrogen atoms, they are said to be saturated. This type of fats seem to increase the cholesterol content of the blood. Polyunsaturated fats, such as those found in fish and vegetable oils contain the least number of hydrogen atoms and do not add to the blood cholesterol content. In general, fats in foods of plant origin are more unsaturated than in those of animal origin.

Fats play several essential roles in the metabolic process. First of all, they provide more than twice the number of calories on a comparative weight basis than do either proteins or carbohydrates. They also can be stored in the body in large quantities and used later as an energy source. They serve as carriers of the fat soluble vitamins A, D, E, K, and they add to the taste of the foods.

Vitamins

Vitamins which are present in minute quantities in food, in their natural state are essential for normal metabolism and for the development and maintenance of tissue structure and function. In addition to fat soluble vitamins noted above, there are a number of B vitamins, as well as vitamin C, also called ascorbic acid. If any particular vitamin is missing from the diet over a sufficiently long time, a specific deficiency disease will

result, for example nightblindness resulting from lack of vitamin A.

The understanding of the complicated role of vitamins in maintaining life and health has come about during this century with a development of highly specialised research. It is likely that continuing research will shed more light on their importance.

Minerals

Minerals are another food component for basic nutritional needs. All living things extract them from the soil, which is their ultimate source. They are needed for normal metabolism and must be present in diet in sufficient amounts for the maintenance of good health. The essential minerals are copper, iodine, iron, manganese, zinc, fluorine, cobalt, calcium and phosphorus. The body contains about 24 minerals which are needed for (1) the formation of bones and teeth, (2) maintenance of the osmotic pressure of body fluids, and (3) for securing specific functions such as blood formation by iron and normal functioning of the thyroid by iodine.

When the normal diet is deficient in certain minerals, these minerals need to be specially added to the diet, or water supply, e.g., iodine for thyroid function and fluorine for protection against dental caries. Additional iron for heamoglobin formation may be indicated when the diet is deficient in it, or when there has been an excessive loss of red blood cells, as some women experience with their menstrual periods.

Water

Water is not really a food, but it is in every way a crucial component of nutrition. It makes up from 55—65% of body's weight and is constantly being eliminated in the form of urine, sweat and expired breath. It must, therefore, be replaced regularly, for while a person can live for weeks without food, he can live for only a few days without water.

Human body requires fuel for its muscular activity. This fuel is provided by food in the form of calories.

[*Photo :* CHEB]

Food energy requirement

The body requires energy for its internal and external work. This is provided by oxidation, in the tissues, of the three proximate principles of food, e.g., carbohydrates, fats and proteins.

This energy value is most conveniently measured in calories according to requirement. This quantity of heat is very small, hence, in nutrition it is customary to use the term kilo calories.

The caloric value of foods depend on the amount of carbohydrates, fats and proteins in them which are as follows:

Carbohydrate	4.1 cal/gm
Fat	9.45 „ „
Protein	4.35 „ „

Malnourished status

PROTEIN CALORIE MALNUTRITION, KWASHIORKAR & MARASMUS

Protein calorie malnutrition of early childhood is an inclusive terminology that has been used to embody a spectrum of nutritional dis-

Considerable evidence has accumulated that proves that significant impairment of intellectual performance may be one of the long-term consequences of protein-calorie malnutrition of even a mild to moderate degree.

orders of varying severity which range from the protein deficiency syndrome known as kwashiorkar at one extreme to overall deprivational syndrome of marasmus at the other. Because marasmus appears to be much more prevalent world-wide than kwashiorkar, the suggestion has been made that the term energy protein malnutrition be substituted for protein calorie malnutrition. This form of malnutrition is the major cause of infant and childhood mortality and morbidity in the world because of its very high prevalence in many developing countries. It has been estimated that at any given time approximately 400 million preschool children throughout the world suffer from some degree of protein calorie malnutrition.

The west African term kwashiorkar was introduced by Williams in 1933 to describe a syndrome most commonly observed in children between the ages of one and three years. However, the disorder can occur at later stage in childhood and occasionally in adults. The term is said to denote an illness in one child displaced from its mother by a subsequent pregnancy. A number of conditioning factors such as parasitism, infections, diarrhoea and childhood exanthems contribute to precipitation of florid stage of the disease. However, the principal cause is a high carbohydrate diet that provides insufficient protein. A similar syndrome can be induced in pigs and monkeys by feeding a low protein diet in which the calories are derived principally from carbohydrates. The clinical features of the syndrome are variable, depending on the extent of the dietary imbalance, the age of onset, the duration of the deficiency state and the severity of conditioning factors.

Hair changes are variable and may include dyspigmentation with lightening of colour; straightening of curly hair, silkiness of texture, and easy "pluckability".

Although fatty liver is an almost invariable pathologic finding, hepatomegaly occurs inconstantly. Associated disorders include anaemia and vitamin deficiency, especially deficiencies of Vitamin A and folic acid as well as a variety of infections and infestations.

NUTRITIONAL MARASMUS

It is comparable with severe semi-starvation in adults, resulting from very low intake of all nutrients, including proteins. This disorder most commonly affects infants during the first year of life and its most conspicuous features are marked wasting of muscle and fat and retardation of growth. Infants with nutritional marasmus are tiny and have typical wizened features which make them appear prematurely old ("The little old man"). The edema and apathy that characterize kwashiorkar are not present. However, minor dyspigmentation of the hair may occur and associated vitamin deficiencies have been observed. Between the extreme advanced kwashiorkar and marked marasmus lies a continuum of intermediate syndromes which inturn range from latent and marginal to forms of marked severity (marasmic kwashiorkar).

Laboratory findings in protein calorie mal-nutrition are highly variable depending in part on the patient's location in the kwashiorkar-nutritional marasmus spectrum and the severity of the disorder. The plasma protein concentration, notably albumin, is greatly reduced in kwashiorkar. However, hypoalbuminiamia is a relatively rarer complication and measurement of this parameter is of a debatable value in the detection of marginal cases.

Although aminoacids ratios are usually abnormal in kwashiorkar, they are frequently normal in marasmus. The relative usefulness of several simple methods such as measurement of height, weight, head circumference and mid-arm circumference is currently under investigation. Considerable evidence has accumulated that significant impairment of intellectual performance may be one of the long term consequences of protein-calorie malnutrition of even a mild to moderate degree. Lastly psychological factors can also have to be kept in mind. ○

Adding Life to Years

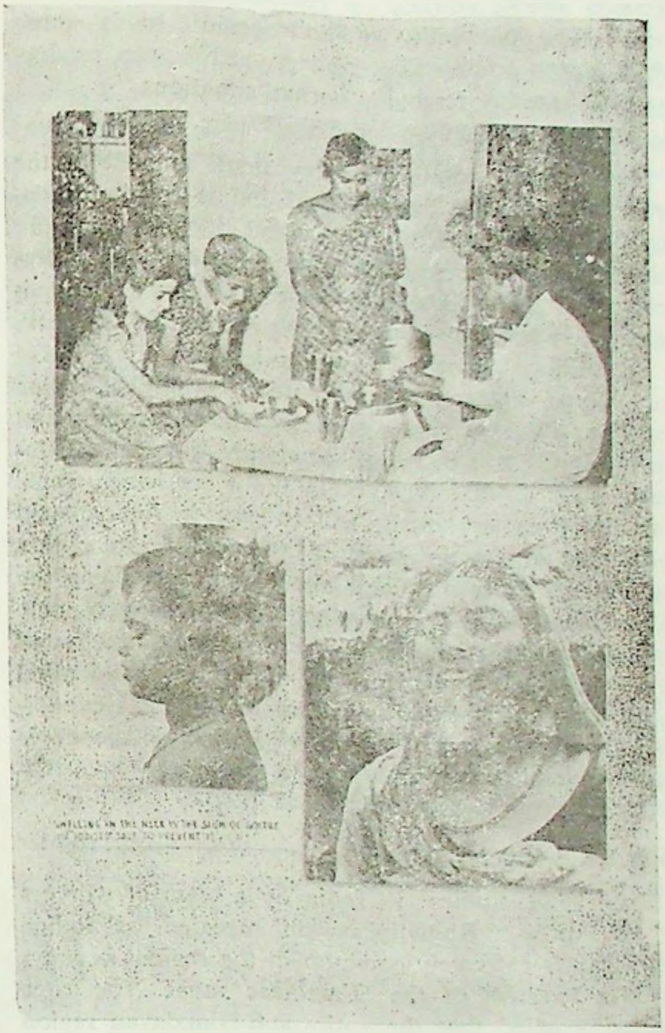
Moderate exercise in adult life—regular walking, for instance—has been shown to reduce death rates from a quarter to a third in some 17,000 graduates of Harvard University, who were followed from the early 1960s through the late 1970s.

"There are a lot of sceptics who say people are active because they are healthy," the New York Times *quotes Dr Ralph S. Paffenbarger Jr., the study's director, as saying. However the findings, reported recently in the* New Journal of Medicine, *indicate the contrary—that " you're healthy because you are active."*

IODINE DEFICIENCY DISORDERS IN INDIA

DR UMESH KAPIL

Studies in recent years in different countries have indicated that contrary to the common belief that iodine deficiency is found in the hilly and mountainous areas, it is equally prevalent in plains, riverine and coastal areas. India has initiated research surveys in different states to assess the extent and magnitude of iodine deficiency outside the conventional sub-Himalayan region.



ENDEMIC goitre and endemic cretinism have been known to occur the world over for thousands of years. In fact, endemic goitre was so common in certain hilly and mountainous regions of some countries that those without any enlargement of the thyroid gland were considered to be slightly abnormal. The condition is widely prevalent in a large number of countries in Africa, Latin America and the South East Asia. The developed countries like Switzerland and the United States have controlled the problem almost to a stage of eradication. However, these conditions continue without any sign of abatement despite the availability of low-cost simple technology for its control.

Endemic goitre and cretinism are the effects of a deficiency of an important mineral, iodine, which is found in soil, water and foods. Earlier studies revealed that in various regions of the world, especially in the hilly and mountainous regions, iodine in the soil was leached out through millions of years of glaciation or being washed away through heavy rains. The leaching resulted in the soil becoming extremely poorer in iodine and leading to a reduction of iodine content of the water present in that soil strata and the vegetation which soil maintains. In other words, Iodine Deficiency of soil is the primary cause of Iodine Deficiency Disorders (IDD). The low Iodine content of water and foods in the endemic area is the secondary effect of deficiency in the soil. Thus IDD

depends almost entirely on geochemical characters of soil. The possibility of goitrogenic foods—those which cause goitre—like cabbage, radish, etc. producing IDD is rather remote in normal situations.

Human body requires a very small amount of the precious mineral. The ingested iodine is almost entirely used by the thyroid gland in producing an essential hormone known as thyroxine. When less amount of iodine is available for the thyroid gland, it enlarges in size causing a swelling in front of the neck, a condition known as endemic goitre. On an average, a man needs 150 micro gram of iodine per day which is easily available through water and foods if the soil on which foods are grown has adequate quantity of iodine. On the other hand people living in areas where the soil is poor in iodine will be unable to get the required amount of idoine that manifests a series of effects, the commonest being the enlargement of the thyroid gland. The areas, extremely poor in iodine result in iodine deficiency manifested in the form of retarded growth of the body and mind and with impairment of physical and mental capabilities. This extreme form of iodine deficiency is called endemic cretinism.

How important is IDD in India

Since 1952, studies in India by a team of workers led by Professor Ramalingaswami revealed that iodine deficiency is extremely common in the regions occupying the foothills of the Himalayas range. The later studies revealed that the entire sub-Himalayan region stretching from Jammu & Kashmir in the West to Mizoram in the east is extremely deficient in iodine and was designated as the Goitre Belt of India. This is the biggest endemic goitre area in the world stretching to about 2000 kms from east to west and inhabited by about 120 million people. Surveys conducted in later years revealed that almost 40 million people living in this area have iodine defiiciency leading to endemic goitre and endemic cretinism. The belt includes the northern regions of Jammu & Kashmir, Punjab, Haryana, Himachal Pradesh, Uttar Pradesh, Bihar, West Bengal, Assam, Arunachal Pradesh & Mizoram.

Studies in recent years in different countries have indicated that contrary to the common belief that iodine deficiency is found only in the hilly and mountainous areas it is equally prevalent in plains, riverine and coastal areas. During the last few years research surveys in different States of the country have been initiated to assess the extent and magnitude of iodine deficiency outside the conventional sub-Himalayan region.

Preliminary data from such surveys have indicated that IDD is equally prevalent in the States of Gujarat, Madhya Pradsh, Maharashtra, Andhra Pradesh, Tamil Nadu, Orissa and Bihar. In several areas of these States, endemic goitre prevalence varies between 25-35% and a significantly low iodine content of ground water. It is now getting increasingly clear that these areas outside the Himalayan belt have iodine deficiency possibly due to heavy rains or recurrent floods with the result that the soil gradually gets poorer in iodine. Thus the endemic areas in India are not only the hilly and mountainous areas, but the plains, the riverine areas and even in coastal strips. This is rather unexpected because sea has the richest source of iodine and it is generally thought that people living near the sea will not have any iodine deficiency. These studies have also indicated the possibility of other factors in the epidemiology of IDD, eg. certain foods and chemical characters of soil.

How is IDD different from Endemic Goitre and Cretinism?

Recent studies have indicated that endemic goitre (enlargement of the thyroid gland), is only one manifestation of iodine deficiency. Deficiency of iodine in pregnant women produce harmful effects in the unborn child within the uterus and especially affecting the development and functioning of the brain. When the child is born, it is already suffering from iodine deficiency i.e., neonatal hypothroidism. With continued iodine deficiency, the child will develop various manifestations—impairment of mental and physical capabilities including deafness, speech impairment, dumbness and other physical disabilities. It is rightly stated that endemic goitre is only the tip of the IDD iceberg. What is commonly observed as endemic goitre is only a small fraction of the manifestations of iodine deficiency and major adverse effects, more sinister than endemic goitre are neither recognised nor their mode of action has been properly understood. Ironically, these are equated with manifestations of under development, and are not seriously considered. Even now, iodine deficiency in many developing countries is synonymous with endemic goitre, and hardly get a high priority within scarce financial resources for its control. It is therefore, urgently necessary to make everyone aware of the tragic affects of iodine deficiency on the well-being of human beings so that immediate action is taken for it's control.

How can IDD be controlled?

Obviously, the simplest measure is to add the missing iodine to the human body through either oral or parenteral route. The oldest method for the control of IDD is the fortification of common salt with iodine. This method has been able to control and even to some extent eradicate IDD from many developed countries. There are of course other methods of adding iodine to the body. Studies in other countries have shown that iodine can also be added to water and even to the bread. However, such methods have not been very successful. In recent years, iodine is being introduced into the human body through injection of iodised oil, a method which gives protection to the human body for a period of 3-5 years. In other words, an injection every 3-5 years will protect the person from IDD. At present, efforts are being made to use iodised oil orally and the preliminary results have shown that this method can also be effective in controlling IDD. Iodised oil approach is much more expensive than the iodated salt approach. Usually, the iodised oil approach is considered as an interim measure whereas iodised salt is a long-term solution. Iodised oil, either as an injection or for oral route, is not produced in India and has to be imported. Efforts are being made in research Institutes in India to produce iodised oil. Even for iodised salt, the iodine, has to be imported from outside, and then converted into potassium iodate for fortifying salt. The conversion of iodine to potassium iodate is done in India.

What has India done for IDD Control?

India is the first country in the South-East Asia region to start the National Goitre Control Programme (NGCP) during 1962. Under the NGCP, iodine compound was added to common salt through a technological process in several iodation centres in the country. At the moment, 12 iodation plants in three different centres in India Kharagoda (Gujarat), Sambhar Lake (Rajasthan) and Howrah (West Bengal) are producing almost two lakh metric tonnes of iodised salt for distribution to the affected parts. Pottasium iodate is used for fortifying salt with iodine since the compound is stable and as such the iodated salt will retain it's iodine contents for a fairly long period. Unfortunately, recent exploratory studies to assess the impact of this programme in the affected areas have demonstrated that the reduction in the prevalance of goitre has been very marginal in most cases, and none in some cases. Careful studies conducted by the Ministry of Health & Family Welfare and other Research Institutions have shown that many operational logistic problems have produced this unsatisfactory condition regarding the impact of this programme. One important lapse has been the highly inadequate production of iodised salt compared to the need of the country which literally 'forced" the affected population to consume non-iodised salt from the neighbouring areas. Unsatisfactory and long storage of iodated salt resulted in a substantial loss of iodine from the salt. There are other important reasons as well.

The Strategy for IDD Control

The Government of India after realizing this unsatisfactory situation and considering the various lapses, both administrative and technical, has decided to adopt universal iodation of salt in the country. Accordingly, entire common salt in the country used for human consumption will be iodized by 1990. The estimated total need of iodised salt at that time will be to the extent of 40 lakh metric tonnes. This is undoubtedly a heroic decision of the Government, but this challenge has to be faced to overcome numerous administrative and logistic difficultis encountered in programme for targetted coverage and when both iodised and not iodised salt are available in the market.

Operational research in various aspects of IDD and it's control is urgently needed in the country not only for better understanding of the epidemiology of the problem and the mechanism of it's affect on human beings but also for more effective control mechanism. Some of the priority areas of research may be

1. Role of goitrogenic food in causation of IDD.
2. Technical, operational, financial and administrative feasibility of oral administration of iodised oil in prevention of IDD.
3. Bioavailability and stability of iodine in Iodated salt under different geo-climatic conditions.
4. Interrelationship between geo-chemical properties of soil and causation of IDD.
5. Profile of salt consumption in different regions of the country.
6. Knowledge, attitude and practices in community regarding epidemiology of IDD.
7. Interrelationship between IDD and Protein energy malnutrition and its impact on growth and development of children under five years of age.
8. Development of simple analytical methods for detection of Iodine in salt and Biological fluids. ○

MALNUTRITION: THE KILLER

PRABHA ARORA

The malnourished infants are less likely to catch up in growth later in life, and the overall growth of children who suffer from malnutrition early in life is poorer. A definite co-relation has been noted between socio-economic status and pre-natal mortality.

MALNUTRITION means imperfect or faulty nutrition, defined as an acute stage of imbalance between requirement of the body for a certain nutrient and its intake. There could be two types of malnutrition. In one, the demand is not fully met, and in the other, the nutrient is consumed in excess. These conditions are defined under-nutrition and over-nutrition respectively.

Malnutrition has today emerged as a major "health problem" in our country. In India, under-nutrition is more prevalent and over-nutrition exists rarely. In general usage, the terms malnutrition and under-nutrition have become almost synonymous. Apart from diseases directly attributable to malnutrition, the contributory role of malnutrition in increasing the susceptibility to infections of various kinds, and in aggravating the course of such infection after they set in, has now been elucidated.

In India, deaths of children of 0--5 years account for nearly 50 per cent of total number of deaths as against 2—4 per cent in affluent countries. The major underlying factor responsible for such a high child mortality is malnutrition. Malnutrition is also responsible for high mortality of mothers in our country. One out of every 50 women in the reproductive age-group die during pregnancy and 15—20 per cent of such deaths are attributed to anaemia.

Most common deficiencies

In the present situation, and from past experience, it seems that deficiencies of total dietary calories, proteins, vitamins, iron, calcium and iodine are the most common in our country. One nutrient, an excess of which is common in isolated parts of the country, is fluoride. Some nutritional disorders are caused by ingestion of poisonous substances found in some articles and cause conditions like lathyrism, afla-toxicosis, epidemic dropsy and veno-occlusive disease of liver.

Malnutrition tends to affect some sections of our society predominantly. Malnutrition being a reflection of unfulfilled dietary demands, it is most likely to occur during the three most demanding periods in human life: (1) growing age, (2) pregnancy, and (3) lactation. Therefore, the worst impact of malnutrition is on people falling within these three groups. Due to restrictions of diet suffered by poorer sections of society, malnutrition is more prevalent among them, and the worst sufferers are infants and children, pregnant and nursing women.

'SFD' Babies

'Small for date' pregnancy (SFD) is a full-term baby whose weight at birth is less than 2,500 gm. Low-birth-weight, intrauterine growth retardation, 'Foetal malnutrition', 'dysmaturity' and 'chronic foetol distress' (due to sub-normal development of the foetus during gestation period) are all usually due to maternal malnutrition. Incidence of SFD babies in developing countries is five times greater than in developed ones. In India, it ranges from 27—33 per cent as compared to 6.7 per cent in Canada and 10.6 per cent in the USA.

It has been found that 15—20 per cent babies born to impoverished mothers show severe growth retardation with birth-weight less than 2 Kg., body length less than 45 cm, and head circumference less than 30 cm. The mean birth-weight in different parts of the country was found to be 2.8 Kg. The same for Western countries is 3.2 Kg. The incidence of low-birth-weight babies in poor families was more than twice of that in well-to-do ones. It was also observed that birth-weight decreased with the lowering of economic conditions of families.

Supplementation with proteins, calories, folic acid, etc. of the diet of poor pregnant women even late in pregnancy significantly increase the birth-weights of their infants. SFD babies are more prone to congenital malformation and chromosomal anomalies, poor thermoregulation, hypoglycemia, hypocalcemia, hypomagnesemia, metabolic acidosis and low levels of immunoglobulins, resulting in a high mortality rate.

Intra-uterine growth retardation is due to reduced transfer of nutrients, either due to placental abnormality or on account of factors like low maternal reserves, maternal diseases and malnutrition. The second group of factors, of which anaemia and hypoproteinemia are most common and most important, leads to poor placental blood supply, resulting in inadequate transfer of even available nutrients.

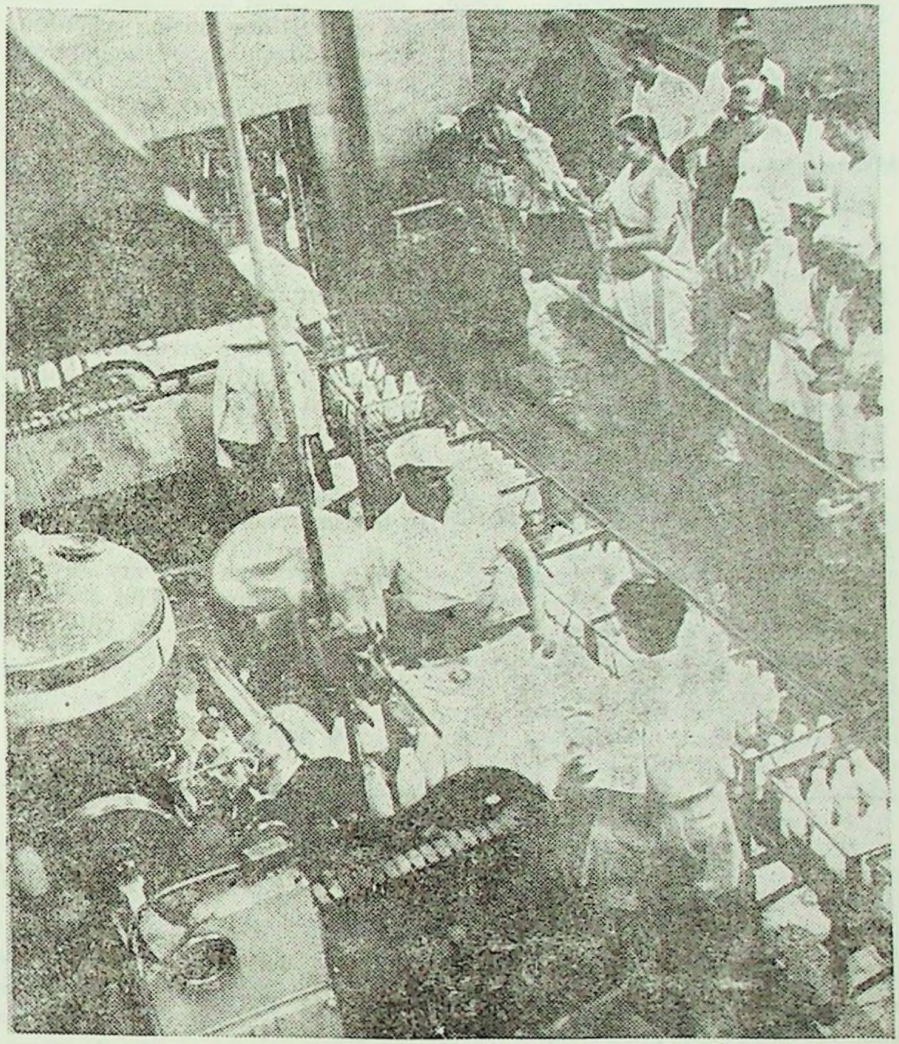
There is a great demand for all nutrients during infancy and childhood. The infants and children of the under-privileged sections of society fall easy prey to malnutrition. These nutrient deficiencies directly affect the growth of infant.

Infant Mortality's importance

Infant mortality rate has been identified as an index of general state of public health of a community. Though a considerable decline has been recorded in the last 20 years, even now our infant mortality rates are high, being 81—87 per 1000 live births as compared to 14.2 in Sweden, 19.1 in Australia and 24.8 in the U.S.A. Besides higher rates of pre-natal deaths and infant mortality, malnutrition leads to increased toddler mortality. It has been suggested that mortality of children between 1—4 years of age is the best index of the seriousness of protein-caloric malnutrition. In the Western countries, toddler mortality rate is one per 1000 live births. In India, it was 33 per 1,000 in 1951 which fell in 1970 to 12 per 1000. However, overall pre-school child mortality in our country is 18.7 per cent of all deaths.

Taking South-East Asia as a whole, 45 per cent of deaths occur before 5 years of age whereas the same percentage of deaths in the U.S.A. occur after the age of 60. Almost 25 per cent of all children born, die before reaching the age of five years according to a recent study in India. Thus, almost a quarter of our infants fail to become adults.

Infant mortality is caused by premature births and low-birth-weight due to maternal malnutrition.



Milk and milk products are the primary protein foods and contain all the necessary aminoacids required for the health of human beings. The Seventh Plan seeks to achieve an annual production of 51 million tonnes of milk against the base level production of 38.80 million tonnes in 1983—84.

[*Photo :* **WHO**]

Although deficiency diseases have been estimated to be directly responsible for only 1—2 per cent deaths, presence of malnutrition aggravates the course of other infectious diseases and is indirectly responsible for a much high toll. Some of the causes of infant mortality have been estimated as follows:

Premature births 33 per cent, respiratory diseases 18.2 per cent, alimentary diseases 11 per cent, fever 4.1 per cent, infections 1.8 per cent, deficiency diseases 1.2 per cent, genito-urinary diseases 0.6 per cent, cardiovascular diseases 0.5 per cent, wounds and accidents 0.2 per cent and venereal causes 0.1 per cent. A definite co-relation has been noted between socio-economic status and pre-natal mortality. More than half the cases of infant mortality can directly or indirectly be attributed to malnutrition. In many situations, delayed weaning is due to poverty as the mother tries to compensate the lack

of solids by breast milk. Then, the nutritional demands of the growing infant remains unsatisfied and malnutrition results in high infant mortality.

Malnourished Infants

These malnourished infants are less likely to catch up in growth later in life and overall growth of children who suffered from malnutrition early in life was poorer. The availability of these essential nutrients to poor sections of our society is nowhere near the requirements. The age-for-age height of children from such families was 2--4 cm. less than the Indian Council of Medical Research (ICMR) standards.

Though it is not easy to predict long-term effects, present evidence indicates that unchanging conditions of malnutrition during gestation, infancy and childhood would lead to a smaller age-for-age population. A survey in rural Andhra Pradesh showed that 20 per cent of preschool children were shorter in stature, 40—50 per cent were lighter in weight, 25 per cent had smaller mid-arm circumference, 9 per cent had smaller heads and 30 per cent had thinner skin fold (fat content) as compared to normal Indian children. Delayed erruption of teeth was noted and 40 per cent had haemoglobin value less than 10.8 gms. (Normal 12-13 gms.).

In urban areas

The problem is very severe in large cities, too. The study conducted in Bombay on children up to the age of 12 including those from urban slums proved that this is an urban problem, too. Of the total number studied, 84 per cent were from families with a monthly *per capita* income of less than Rs. 40. Their height was 2-4 cms less than the ICMR standards. Over 54 per cent had haemoglobin values less than 11 gms (Normal 12-13 gms).

Fortunately, several nutritional problems of our country can be mitigated today, if not entirely solved, through currently available technological tools even under the prevailing socio-economic conditions. The health sector plays a major role in the implementation of these programmes, which can make an important contribution to the nutritional uplift of poor communities under the present circumstances.○

NATURE COMPENSATES FOR DIETARY DEFICIENCIES

It has been long known that "eating for two" during pregnancy is unnecessary, but expectant mothers do need more food to help them produce healthy babies and to equip their bodies for breastfeeding. But a new study has shown that pregnant women have remarkable ways of naturally compensating for dietary deficiencies.

The U.K. Medical Research Council's Dunn Nutrition Unit, based at Cambridge, has been investigating the nutritional needs of pregnant women at its field station at Keneba in the Gambia. It has found that in practice few women increase their food intake by the recommended 15 per cent during pregnancy but nevertheless few babies suffer as a result.

There are said to be three main reasons for this. First, expectant mothers spend more time resting. Dr Roger Whitehead, the Dunn Unit's Director, Says cutting down on activity during pregnancy is one of the most important ways of ensuring that a woman will have a healthy baby.

Secondly, women experience natural metabolic changes during pregnancy, but the resting metabolic rate does not increase by anything like as much as experts assumed would be necessary to support the increasing size of the baby and supporting reproductive tissues.

Thirdly, researchers have found that when food really is short, a pregnant woman lays down less fat, although this can lead to greater stress after delivery when she needs the stored energy for breastfeeding her baby.

Dr Whitehead is anxious to stress there is a limit to these natural mechanisms. "While scientists such as myself can marvel at the ways nature has devised to protect a baby still in the womb, once a woman has passed the threshold of these accommodating factors, the size of the baby does suffer."

The Gambia study has shown that during the wet season, when food is very short, 30 per cent of babies are born weighing less than 2.5 kilos. Babies born too small are more prone to fall victim to infection. Small birthweight can also affect long-term physical and mental development. By giving mothers a dietary supplement in the form of a groundnut biscuit during the last six months of pregnancy, scientists have managed to reduce the incidence of low birthweight babies to only five per cent. "It is particularly encouraging to note that this advantage stays with those babies throughout infancy. They grown better and are now able to ward off infection," says Dr Whitehead.—Spectrum

STORY

THE PARTY—KAVITA WILL NEVER FORGET

DR R. L. BIJLANI

IT all happened last summer. The schools had just reopened after the summer vacation. Rahul distributed toffees to the classmates for his birthday. He had also invited to his home those class-mates who had stayed close to him for a party in the evening. "My birthday was, in fact, on 2nd July. But I postponed the party by 6 days so that I could invite you all. Please do come," Rahul told them. Kavita was among those invited.

It was a great party, indeed. There were games, and there was a lot to eat. To top it all, there was fruit cream. Reena was unlucky for she was having a bad throat, and therefore did not take fruit-cream. Dabboo, the fat boy, was always looking for an excuse to eat more. He gallantly came forward to help Reena out by accepting her share of fruit-cream, too. All good things must come to an end, however, and so did the party. Everyone said goodbye to Rahul and started going home.

Soon after reaching home, Dabboo felt uneasy. As time passed, the uneasiness grew. He became restless. His parents were worried, and were thinking of what to do, when he vomited. He was put to bed, but could not stay there long; for, he soon felt like going to the toilet. He had a large, watery motion. This continued, and within the span of half an hour, he had vomited twice and passed five loose stools. His parents knew that clean boiled water with salt, sugar and lemon juice should be given to a child who is vomiting and having loose motions to make up for what the body is losing. They boiled and cooled some water, and made *nimboo-pani* out of it, and gave it to Dabboo to drink. In the meantime, they got ready to go to the hospital. In the Casualty, the doctor was told how Dabboo had gone for a birthday party, and soon after returning home, had vomited thrice and passed seven loose stools within two hours. The doctor felt that probably something that he ate at the party was not right. He told the parents not to worry, and asked the nurse to set up an i.v. drip. He told Dabboo that the most essential thing to do was to send back into his body the water and salts he had lost in the process of vomiting and passing loose motions. Therefore, it was good that he had been taking *nimboo-pani;* in fact, that was the easiest and safest way to return to the body what he had lost. But in the hospital, they were going to use the surest and fastes way to replace the losses. They were going to inject water and salts directly into his blood. Words like injection and blood terrified Dabboo to no end, but the gentle behaviour of the doctor was a great comfort. Finally arrived the nurse with a smile on her face and a neat little bottle in her hands. She hung the bottle on the stand, and connected some plastic tubes to it. Then she used a needle to send the 'water' from the bottle into Dabboo's blood. The prick of the needle was not half as bad as he had imagined. The doctor also asked Dabboo's parents if they had brought a sample of the stool or vomitus with them, but they hadn't. If they had, he could have examined the sample to try and find out the type of germs which had made Dabboo sick.

Enters Kavita

The doctor had hardly taken care of Dabboo when Kavita and her parents walked in Kavita had also been sick. She had vomited once and passed four loose stools in the last two hours. It did not take the doctor long to find out that both the children had been to the same party. Fortunately, Kavita's parents had brought a few samples of her stools. Kavita did not look as sick as Dabboo. So the doctor asked her parents to continue with the *nimboo-pani* which they had already started at home. However, he took the samples they had brought and sent them for examination. He also told Kavita's parents to find out what had happened to the other children who had gone to the party. They discovered that Reena and Savita were all right, but all the other children, including Rahul himself, were sick—some just a little bit, and others quite so, but none was as sick as Dabboo. On further questioning by the doctor about who had what at the party, they found that it all fell into a pattern. Daboo had double his share of fruit cream, and he had suffered the most. Reena did not

(*Contd. on page 244*)

MESSAGE AND MEDIA IN NEO-NATAL CARE

PARAS NATH GARG

Neo-natal care starts even before conception or premarital age through postponement of first pregnancy until the mother herself has reached full physical maturity and through spacing of births. It continues from conception, through suitable care during pregnancy, child-birth and childhood. Communication campaigns can be planned and implemented in neo-natal care to initiate new behaviour, reinforce behaviour which may not be stable or change behaviour which is undesirable.

HEALTH communication is a process by which health idea is transferred from a source (such as primary health centre) to a receiver (community) with the intent to change the latter's behaviour. Further in designing communication programmes and campaigns, it is essential to consider *media factors* such as media distribution; reach and accessibility to the target group; *audience factors* as audience comprehension and understandability of messages, and audience selective exposure to selective perception of and selective utilization of media and messages; *message factors* as thematic content and treatment of messages, language level, information content and density of messages.

Neonatal care starts even before conception or premarital age through postponement of first pregnancy until the mother herself has reached full physical maturity and through spacing of births. It continues from conception, through suitable care during pregnancy, child birth and childhood.

Target Group (Receiver) in Neonatal Care

* Parents, grandmothers
* Traditional birth attendants, Traditional health practitioners, trained dais.
* Village health guides, multi-purpose workers, *Balbadi, Anganwadi* workers.
* Mahila mandals and community influential leaders.

The terms media, medium and channel are synonyms and most frequently used in communication literature. Generally, the term media refers to mass media. As a matter of fact, there are other media in addition to mass media. These include: (a) mass media, (b) Interpersonal communication, (c) traditional/indigenous folk media.

(a) *Mass media*

Mass media have been classified as impersonal devices that multiply a message many times in transmitting the message from a source to the audience. They spread messages with words, sound and pictures. Mass media not only carry programme-information to a large number of people, but can also reach all of them with the same message at the same time.

In the natal care (premarital age to child-birth), mass media are used for creating or sustaining a favourable climate, supporting the channels of face-to-face communication and creating mass awareness for the programmes and related activities. The basic role of mass media is to:

* Create awareness and political will about ante-natal care, pre-natal care and neo-natal care and its goal.
* Build public opinion and enlist participation of women, birth attendants, trained *dais* and traditional health practitioners, in fostering communication for involvement.
* Help in social encouragement and moral responsibility by raising the consciousness.
* Provide support to face-to-face communication at home and at clinic level.
* To inform decision makers about the latest developments. Press, radio, TV, printed materials, according to the educational status of the target group, could be used much more advantageously to promote neonatal care services and to encourage greater utilization of the existing health care at different levels.

(b) *Interpersonal media*

This media refers to face-to-face communication and discussion in individual and group situations. Personal communication which takes place continuously between relatives, friends, neighbours and others has been found to be a major factor in promoting adoption of new ideas, including those of family planning. One should never entrust his message to a single medium, but make a judicious use of different media. A multimedia approach has been widely accepted and this

should be adopted in educational activities for maternal and child health care. Interpersonal media generally involve the following target groups in neonatal care:

* Parents, grandmothers, pregnant and nursing mothers.
* Influential and opinion leaders.
* Trained and untrained *dais*, village health guides, traditional health practitioners (THPs).
* *Balwadi, Anganwadi,* Multipurpose workers.

Interpersonal communication, which is suitably regulated by local social structure, promotes local participation in health and famliy welfare programme.

Interpersonal media promote greater flexibility in communication. For example, if the communicator faces problems in the course of discussion, he or she can change the message so as to suit the reactions and feelings of the audience. The personal relationship of the involved individuals is further strengthened and this acts as a reward as well as a motivating factor within the situation.

Opinion leaders', *viz.*, (*Dais* and traditional health practitioners) role in interpersonal communication is very crucial in facilitating decision making and behavioural changes.

Favourable practices can be adopted by motivating and providing scientific and systematic information to the service group in regard to dangerous traditional practices. Considering the educational level of women and trained and untrained *Dais* (India 24.73 per 100 and Madhya Pradesh, 15.53 per 100 female literacy), model flash card, flannel-graph, slides, tape recorder and pictures are useful media.

(c) *Traditional indigenous folk media*

The traditional folk media of communication have a good impact on the rural audience. A planned programme of preparation and use of different media including the coordination of the message through them is very important.

Traditional folk media transmit messages and information through songs, dance, drama, puppet show and story-telling. Traditional media very often incorporate the peoples' beliefs, social system and values. Therefore, its credibility is high. This makes them a very useful vehicle for promoting health and family welfare programmes.

Traditional and folk media include a wide range of verbal communication, performing arts and visual aids. Health workers can prepare and use these according to the socio-cultural beliefs and values of the population to be given the information.

Message is Neonatal care

Message is the *Heart* of the communication process. Health workers and trained birth attendants (TBAs) are change-agents who are required to plan and implemnt persuasive communication, the purpose of which is to initiate a new behaviour, reinforce behaviour

Trained birth attendants help build public opinion and enlist women's participation.

which may not be stable or change behaviour which is undesirable. Communication to be effective must fulfil certain conditions.

To bring about the desired response the message must gain the attention of the target group (*i.e.* pregnant and puerperal mothers, grandmothers and TBAs). It must be understood by them exactly as intended by the communicator. It must be related to their felt needs and thus arouse their interest. It must indicate means of meeting these needs which are acceptable to the society. Having ensured that message content fulfils these conditions, the communicator must decide upon the choice and combination of channels.

Choosing the appropriate channels depends upon factors, such as availability of channels to the sender and the capability of the audience or group to be exposed to the media to receive the message. Litetracy, accessibility to channel and trust in the source influence the capability of the receiver.

Message Contents

Communication contents or message for neonatal care must include the following areas:

(a) *Complete preparation for motherhood.*—premarital, antenatal, natal and postnatal care, psychophysiological preparation for child-birth, role of grandmothers and opinion leaders.

(b) *Neonatal care* : Resuscitation, cord care, breast-feeding, avoidance of infection, maintenance of body temperature and early detection of congenital disorders.

(c) *Positive attitude towards traditional practices.*— In these areas, motivational, emotional and fear arousal message is required, alongwith the scientific reasons. Main dangerous traditional practices are :

—Delaying the first feeding to 2-3 days after delivery

—Fasting practices after delivery.

—Annaprasan—ceremony at the age of 9-10 months.

—Cutting of umbilical cord through unhygienic and unsterilized instrument by TBA and relative.

(*Contd. on page 244*)

Primary Health Care

In the game of life and death many people in the world are playing against the odds:

- **1 in 2 never see a trained health worker**
- **1 in 3 are without clean drinking water**
- **1 in 4 have an inadequate diet**

Every year diarrhoea kills 5 million under-fives; malaria kills one million people in Africa alone. These and other killer diseases are preventable. Doctors and hospitals offer cures for some. But what can really change the survival odds is a package known as Primary Health Care (PHC).

FOOD AND NUTRITION

- Around two-thirds of under-fives in the poor world are malnourished.

PHC means ensuring an adequate, affordable food supply and a balanced diet

WATER AND SANITATION

- 80% of the world's disease is related to lack of safe water and sanitation.

PHC means providing everyone with clean water and basic sanitation.

DISEASE CONTROL

- Some 5 million children die and another 5 million are disabled yearly from 6 common childhood diseases.

PHC means immunisation against childhood diseases and combatting others like malaria.

MATERNAL AND CHILD HEALTH

- Over half a million mothers die in childbirth and 10% of babies die before their first birthday.

PHC means trained birth attendants, promotion of family planning and monitoring child health.

ESSENTIAL DRUGS

- Up to 50% of health budgets are spent on drugs.

PHC means restricting drugs to 200 essentials, preferably locally manufactured, and made available to everyone at a cost they can afford.

CURATIVE CARE

- 1,000 million cases of acute diarrhoea in under-fives each year.
- 33% of people in the world infested with hookworm.

PHC means training village health workers to diagnose and treat common diseases and injuries.

TRADITIONAL MEDICINE

- Traditional birth attendants deliver 60% – 80% of babies in the developing world.

PHC means enlisting traditional healers, giving additional training and using traditional medicines.

HEALTH EDUCATION

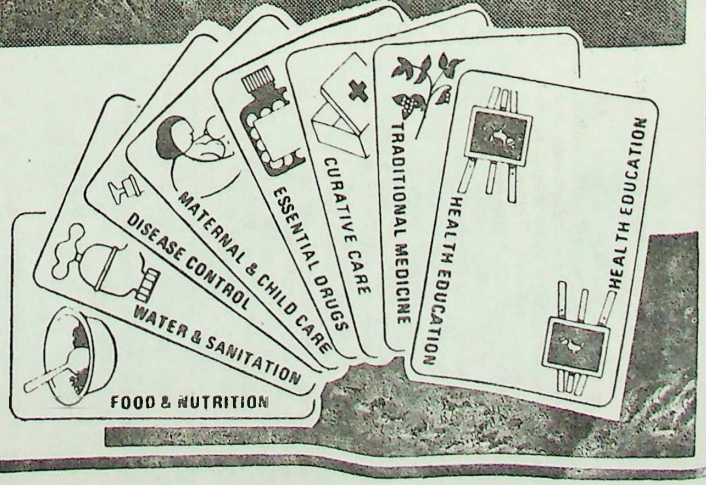
- Preventing ill health depends on changing personal and social habits.

PHC means educating people in understanding the causes of ill health and promoting their own health needs.

THE WINNING HAND

The eight elements of Primary Health Care give everyone – young children and poor people especially – the best chance of winning the fight for life.

The cost of putting PHC into practice worldwide is an extra $50 billion a year: less than two-thirds of what the world spends on cigarettes, and only one-fifteenth of world military expenditure.



THE PARTY KAVITA WILL NEVER FORGET—*Contd. from page 239*

have fruit cream at all, and she was all right. All other children had fruit cream, and, except for Savita, were sick. The doctor said that the exceptional case of Savita was not very surprising. Some people, sometimes, can get away with spoilt stuff. Things like that did happen, he added. So the culprit was fruit cream. Kavita's parents wanted to know if one could make sure about it. The doctor said that a sample of the fruit cream was essential for that.

The next morning, Kavita's father met Rahul's father and talked the matter over. Luckily there was still some fruit-cream left over from last evening's party. Some fruit cream was handed over to the doctor for examination. He sent it for the same sort of test for which he had sent Savita's stool. In that test, favourable conditions are provided for germs to multiply, and an arrangement is also made to identify them. After a few days, the report of the test was available. The fruit-cream had the same sort of germs that Kavitas stool had. That made it pretty sure that the fruit cream was responsible for the children's illness. The doctor said to the children, "I am sure you all like fruit-cream—I like it, too. But the germs like it as well. Therefore, if cream has been lying warm for some time, germs grow in it very easily. Other foods on which germs thrive, and which can therefore lead to a similar illness, are chaat, dahi-bada, sugarcane juice, sweets, ice, and sometimes poor quality icecream. To avoid falling sick, never take food that has been lying for a long time outside the refrigerator. It is specially important to take only clean drinking water. When eating outside, specially at large gatherings, avoid drinking water and iced drinks, and as far as possible, eat only items which are hot. Heat kills germs: therefore, when you eat a hot pakora or drink a hot cup of tea, you are sure that at least you are not taking in any germs.' The children thanked the doctor for his advice, and decided to follow it in future. ●

MESSAGE AND MEDIA IN NEO-NATAL CARE—*Contd. from page 241*

—Deliveries in dark room, ill-ventilated and cleaned by using the cow or buffalo dung.

—Using ash and oil on cord in place of suitable antiseptic powder.

Principles of media and message selection

Audience understanding: The individual is a part of the society. Every individual has his own perceptions, purposes, needs, concepts, beliefs, understanding and culture. For the development and use of media one should be aware of the audience for whom he is devising the media.

Pretesting of communication material and message: Educational materials need to be pretested with a small group of typical audience to assess reaction. Pretesting, before their large-scale production and dissemination, will keep down the cost. Pretesting minimises communication failures. The following characteristics of a message can be pretested in view of target groups:

1. Effectiveness of appeal
2. Readability
3. Clarity
4. Comprehensibility
5. Effectiveness of presentation
6. Acceptability
7. Length
8. Credibility
9. Appropriateness of layout work, colour, etc.
10. Agreement of audience with the message.

Emotional and motivational appeal in innovative approaches: Innovative approaches in neonatal care must involve the emotional appeal, specially in popularization and adoption of breastfeeding and care of umbilical cord.

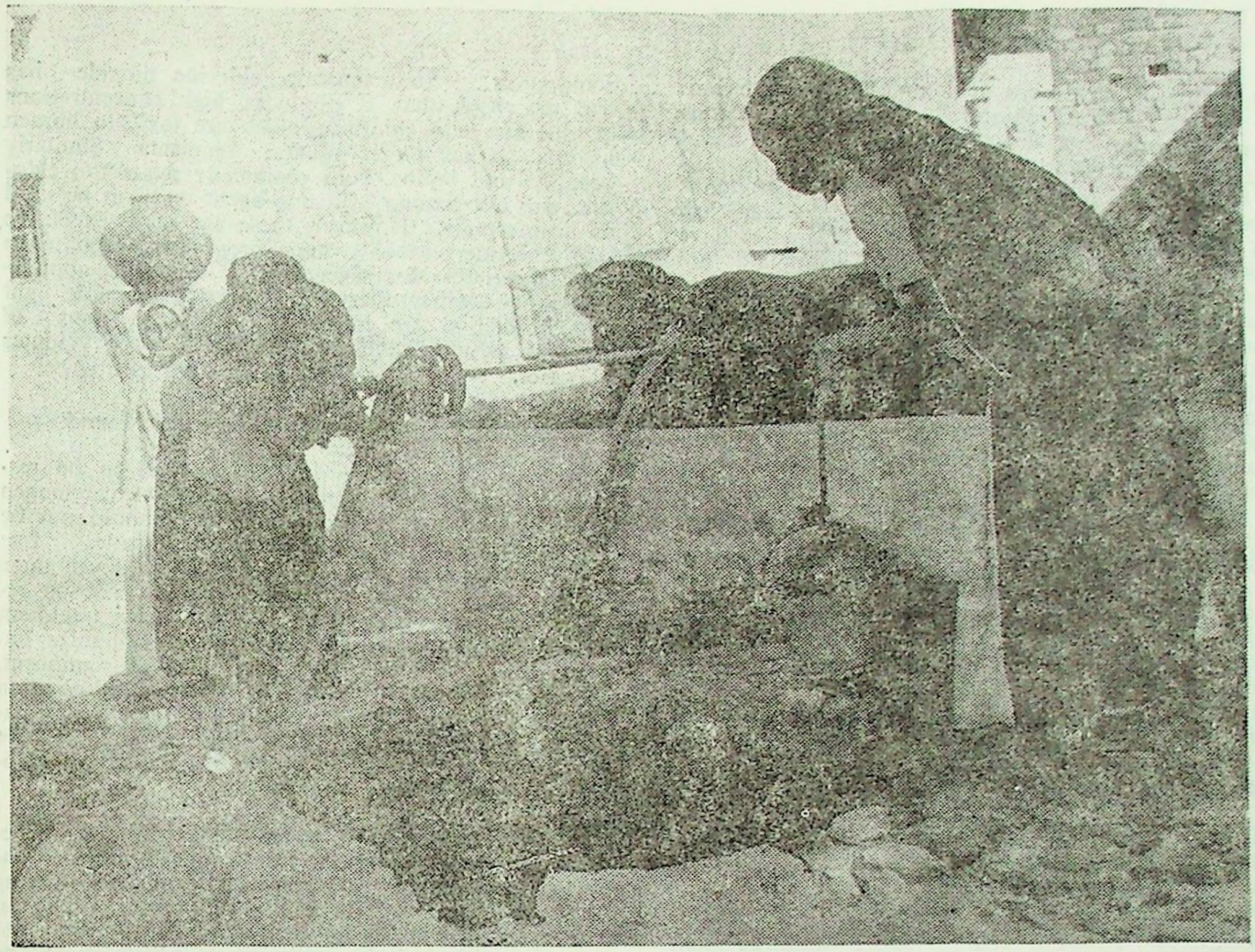
Communication by satisfied adopter: Research studies reveal that satisfied adopters play pivotal role in behavioural and practice change. Satisfied adopter of female sterilization and the grandmother are the best communicators for motivating the mothers to attend antenatal, postnatal and neonatal clinics and practising breastfeeding.

Fear arousal message: Communication studies reveal that fear, threat, and anxiety have powerful motivational components. These are applied extensively for favourable changes in health behaviour. Fear arousal message can be effective in neonatal and infant care specially in the areas of breastfeeding, timely immunization and cutting of umbilical cord at home level by *Dais* and family relatives.

Socio-economic and cultural similarity

It is true that the audience accept the message communicated by the local leaders or health care providers due to the same socio-economic and cultural similarity. Trained and untrained birth attendants, village health guides and traditional health practitioners are the best examples in neonatal care. These agencies are also seen as two-way flow of communicators. People have a tendency to pass information to their nearer target group.

Message and media should be selected separately for rural and urban set-ups and according to the target groups. Message must be prepared in clear, simple, unambiguous terms.



IS CHLORINATED WATER SAFE TO DRINK ?

P. K. RAY
B. S. KHANGAROT

Chlorination of water has tremendous benefits for human beings as it improves public health through destroying or reducing the incidence of water-borne pathogens. However, chlorination presents possible hazards to human health and the environment, which should be given adequate consideration so that its random use can be restricted.

CHLORINE has been the most widely used disinfecting agent for drinking water and waste water treatments in both municipal and industrial applications. The chlorination of water has been of tremendous significance in eliminating the water borne diseases by killing bacteria, fungi and invertebrate animals. The reaction of chlorine in water take place as follows:

$$Cl_2 + H_2O \quad HOCL + H^+ + Cl^-$$

$$HOCL + H_2O \quad H^+ + OCL^-$$

Both the hypochlorous acid and hypochlorite ions are termed as "free chlorine". Hypochlorous ions react with ammonia or other organic amines that may present in water to form toxic compounds called chloramines. These secondary toxic compounds present an environmental health hazards to man, fish and other non-target organisms. Recent studies have shown that these chlorinated organic compounds are carcinogenic to man. Laboratory tests indicate that trout, salmon and plankton are highly susceptible to chlorine toxicity. Experimentally, it has been shown that 50 per cent of rainbow trouts are killed within 96 hour by a residual chlorine level of 0.014 to 0.029 ppm (parts per million). The more hazardous compounds formed by reaction of chlorine with organic chemicals present in the water are a class of compounds known as THMs (Trihalomethanes), which are formed of methane—a single carbon atom bounded to four hydrogen atoms, in which three of the hydrogen atoms have been replaced by chlorine or by other halogen atoms. THMs include chloroform, bromoform and iodoform. The toxicity and public health hazards of THMs compounds are well known. These are highly reactive compounds, inhibit enzymes activities, damage the target organs, such as, liver and kidney and some of them even show carcinogenic (cancer producing) activity.

Reducing after effect of chlorine

The adverse effects of chlorine can be reduced either by reducing the amount of chlorine added to water or by replacement of chlorination with other methods. A number of possible alternative disinfectants have been suggested such as chloramines, chlorine dioxide, bromine, iodine, ozone, bromine chloride, ultraviolet lights (UV), and irradiation. All these alternative disinfectants have advantages and disadvantages. The disadvantages include the formation of harmful compounds that were not present in untreated water. Therefore, usage of all these methods may depend on the risk versus benefit ratio.

Possible alternatives such as chloramines, which are added to water may react with ammonia or other organic amines and produce about 70% less total organic chlorine (TOCl) than chlorine and are also less harmful than chlorine. However, chloramines have less disinfecting power than chlorine and persist longer in the water supply system which may have to be taken into consideration.

Another alternative disinfecting agent, chlorine dioxide produces much lower levels of THMs and TOCl than chlorine, and it produces no brominated compounds. Unfortunately, chlorine dioxide has one drawback that it produces high concentrations of chlorates and chlorites, which are toxic to human health and non-target aquatic organisms. Similarly bromine and iodine, both chemically related to chlorine, are also strong oxidizing agent and can be used as disinfectants. However, these are more expensive than chlorine and have toxic properties which make them unsuitable for several water treatment applications. The other alternative methods like UV light and irradiation are impractical from the point of view of its utilization for disinfecting large volumes of water.

Chlorination to continue till substitute is found

Although chlorination has been found to be responsible for the production of potential carcinogen in drinking water, its continuous use should not be stopped until or unless adequate substitutes, free from harmful side effects, are available. Even then, water disinfection with chlorine should not be replaced until it has been shown that water treatment process manifestation is inadequate to minimize hazards due to carcinogens. TMHs risk is significant, it can be removed by modifications in chlorination practices rather than by complete stop of chlorination. Further research should be directed to remove TMHs or the reduction of these potential carcinogens once produced in drinking water.

Thus, chlorination of water has tremendous benefits for human beings by improving the water quality to improve the public health through destroying or reducing the incidences of water borne pathogens. However, chlorination presents possible hazards to human health and the environment which should be given adequate consideration so that its random use can be restricted.

FURTHER READINGS

1. Jolly, R. L. (Ed.). Water chlorination: Environmental impact and health effects. Ann. Arbor, MI: Ann. Arbor Science, 1978, Vol. I.

2. Cotruvo, J. A. (1981). THMs in drinking water. Environ. Sci. Technol. 15: 268-274.

3. Clarke, R. M. (1981). Evaluating costs and benefits of alternative disinfactants. J. Am. Water Works Assoc. 93: 89-93.

4. Brungs, W. A. (1973). Effects of residual chlorine on aquatic life. J. Water Pollut. Control Fed. 45: 2180-2193.

THE RESULT OF EDUCATION is :

an expected change in the behaviour of the student in the course of a given period.

From : J. J. Guilbert, *Educational handbook for health personnel* (WHO Offset Publication No. 35), Geneva, 1977, p. 108.

Epidemiological surveillance has very wide scope to cover all aspects of the disease that are pertinent for its control. In short, epidemiological surveillance is information for action.

PRIORITY DISEASES FOR EPIDEMIOLOGICAL SURVEILLANCE

R. S. SHARMA

EPIDEMIOLOGICAL surveillance of disease is the continuing scrutiny of all aspects of occurrence and spread of disease that are pertinent to effective control ([1]). This includes systematic collection and evaluation of data on morbidity and mortality, field investigation of epidemics, isolation and characterization of infectious agents by laboratories, relevant aspects of vaccines, insecticides and other substances used in control and immunological status information. Therefore, epidemiological surveillance has very wide scope to cover all aspects of the disease that are pertinent for its control. In short epidemiological surveillance is information for action.

However, there has not been always total agreement regarding the exact meaning and scope of epidemiological surveillance. The following working definition of epidemiological surveillance was adopted at the consultative meeting on epidemiological surveillance held in Colombo, Sri Lanka in December 1985; "The dynamic close continued observational study and monitoring of the health status of a population and trends of disease occurrence through a systematic collection, tabulation and analysis of relevant health, mortality and morbidity data with interpretations to those who need to know and are responsible for control and prevention activities ([2])".

Requirements

India is committed to attain the goal of "Health for All by the year 2000 A.D.", through the universal provision of comprehensive primary health care services. Our National Health Policy ([3]) lays sufficient stress on the development of Management Information System. We are having health infrastructure at the peripheral and higher level. Recent pilot studies also revealed that it is feasible to develop community/village level surveillance ([4]), in addition to passive surveillance through hospitals/dispensaries, etc. ([5]) and sentinel surveillance ([6]). In order to achieve the qualitative and quantitative goals for our health and family welfare programmes, as given in National Health Policy Statement (3), it is important to develop epidemiological services in the country.

Priorities

A large number of ailments cause human suffering. W.H.O. is preparing a detailed 10th revision of International Classification of diseases, which is likely to be ready by 1990 and operative from 1993. It may not be possible and may not be required also, to have surveillance for all these diseases. Priority need to be fixed for disease surveillance at National and regional levels. Different States in India have their own list of notifiable diseases. Few among the several diseases of public health importance may have to be selected. The decisions may be difficult. but the following parameters of the diseases are helpful in making priorities for surveillance :

(i) morbidity quantum, (ii) mortality, (iii) illness duration, (iv) severity of sickness, (v) destability or residual effect of the disease, (vi) age-group involved. (vii) epidemicity, (viii) diagnostic feasibility, (ix) amenability to control, (x) financial input required for control, (xi) requirements of International Health Regulations. and (xii) impact on economic development.

To pinpoint the prority, the weightage can be worked out for each of the points given above. Each disease will score the marks against each point, which will be added up to give the total weightage. The disease which will get the maximum weightage by such scoring should be the priority disease for epidemiological surveillance. In this way a priority order for all the diseases can be prepared. But such an exercise require all the relevant information on the disease in question. This is extremely difficult. So assessment by experts taking all the relevant information available, may help in determining priority diseases for surveillance. It may also be necessary to review and modify the priority order from time to time.

Programme development

Recently, the National Institute of Communicable Diseases (NICD) formulated a programme for promotion of surveillance in the country. After careful consideration of various parameters mentioned above, the epidemic-prone diseases selected were : diarrhoeal diseases, measles, poliomyelitis among the 5 years children and viral hepatitis and Japanese encephalitis among all ages. The field trial was undertaken in five districts of five states with successful results. More recently Acquired Immuno Deficiency Syndrome (AIDS) has been selected for nation-wide surveillance following the report of serologically detected antibodies to the infection against HTLV-III virus among six women from Tamil Nadu in April 1986 followed by the detection of more infected persons in the area. National viral hepatitis surveillance programme has been developed. Rabies control programme is also being developed. Other programmes of non-communicable diseases focusing the attention of the planners are dental health, mental health, cancer and cardiovascular diseases. In other words we have reached a stage when we will be facing the problems of non-communicable diseases in addition to communicable diseases.

It may be mentioned here that the most important element of smallpox eradication was an effective surveillance programme. Other diseases where eradication is feasible are guineaworm disease and yaws, requiring priority in surveillance.

REFERENCES

1. Control of Communicable Diseases in Man. Ed. Abram S. Benenson. 14th Edition—1985. American Public Health Association, 1015 Fifteenth Street NW Washington DC20005. (Page 456).

2. R. Kim-Farley, R. Aslanian and A. Sohnur. The concept of Epidemiological Surveillance. Progress in Development of Epidemiological services. National Institute of Communicable Diseases, Delhi—May 1986 (page 13-21).

3. Statement on National Health Policy, Govt. of India, Ministry of Health and Family Welfare, New Delhi-1982.

4. R. S. Sharma, J. P. Gupta, R. N. Basu (1986). Assessment of Epidemic-prone diseases surveillance in Alwar district, Rajasthan (India). International Epidemiological Association, Regional Scientific Meeting, Jhansi (India), 25-28 February 1986.

5. Hand Book of Health Statistics of India—1985. Central Bureau of Health Intelligence, DGHS, New Delhi.

6. Sentinel Surveillance—1985. National Institute of Communicable Diseases, Delhi.

BEHAVIOURAL SCIENCES AND COMMUNITY HEALTH PROBLEMS

DR S. C. GUPTA
DR M. L. CHUGH

People mostly contract infection in the community and not in the Hospital. They come to hospital for treatment. So if we are really committed to curb the morbidity and mortality, we must understand the community in depth and the different forces operating in it, which can only be done, if we have a sufficient understanding of the subject matters of behavioural sciences.

Relations between medicine and behavioural Sciences have been explored intensively from both sides of the fence in recent years. Health services throughout the world are now confronted with new challenges. They are no longer considered merely as a complex of solely medical measures but as an important component of socio-economic development (WHO, 1975), The enjoyment of highest attainable standard of health is a fundamental right of every human being. In providing health°for all by the year 2000 A.D., health by the people is one of the important approaches which is gaining wide acceptance as an alternative approach to delivery of health care. In this, communities are encouraged to identify their own health needs and objectives, order and rank them and to develop their internal and external resources to meet these needs through joint efforts.

A wide range of illness can be prevented/treated at the community level by the community itself after simple training and its exposure to the knowledge of common community health problems. Today, community health encompasses the entire gamut of community organized efforts for maintaining, protecting and improving the health of people. Probably as stated by Leavell (1952) and Mahley (1983), many communities, physicians and the other health workers, responsible for the delivery of community health care today, have had relatively little knowledge of behavioural sciences responsible for health behavioural changes in the different communities. It is comparatively difficult, therefore, to understand precisely the relationship between behavioural sciences and health and medicine. In this article attempts have been made to specify this relationship in a very concise form.

Changing Structure of a Community

If we wish to help a community improve its health, the first principle in community health is to start with people as they are and with the community as it is. As pointed out by various behavioural scientists, every community has a health culture of its own, which is closely tied up with its social structure. In the modern era one could see that in the process of social change, community structure is deeply stirred by emergent forces threatening to over-run the flimsy beliefs created by various old generations. Owing to the said dynamic forces, tremendous structural and functional changes are taking place very rapidly in the contemporary urban and rural communities. It is therefore, essential for health functionaries to know these new emerging forces, if they are to provide comprehensive health services to the community through the available health infrastructure.

To understand what caused a community to become sick, it is necessary to know what sort of families it has, how the people in that community live, what kind of clothes people wear, what food they eat, what kind of employment they have, what are their customs, values, beliefs, traditions and habits as all these have close relevance to health of a community. The above and many other changing

aspects of behavioural sciences are crucial to understanding relationship between man and social environment.

Definition of community

Different scientists have defined the community in different ways. The definition of community which is universally accepted is, "An area of social living marked by some degree of social coherence." It denotes uniformity permanently shared by the people over a region. In other words it is a group of people having common life. Every community differs from the other community in its language, mores, folkways, myths, superstitions, and other social institutions like caste, class and family patterns, etc. It has a specific geographical area and interdependency followed by community sentiments.

In a community life, a greater emphasis is laid upon unity, *i.e.*, resulting due to common living and thinking than its regional aspects. Members generally have common interest and they are mostly in agreement with one another. Hence, a goal of community health is to achieve average status of health of the individual. As documented by Berry (1953), medical education is in transition, and increasing emphasis has been and will be placed on the relationship between the men and their socio-cultural and economic environment in a community setting.

Forces faced by modern community

There are countless forces which are today responsible for different transformations in the community life. Among the more important of these are increasing industrialization and urbanization resulting in a shift from relative independence to greater interdependence. There is a tremendous shift in the human outlook towards individualism and materialism. Greater geographic mobility of the population have altered housing arrangements and is also responsible for the creation of urban slum colonies. Disintegration of joint family pattern has increased the problem for older family members, widows and sick persons. The problems of food supply as well as other means of subsistence and rapid increase in the population owing to greater application of preventive medicine are causing greater concern in many parts of the world. In the developing countries like India, many old traditional health practices like breastfeeding, have witnessed a big setback.

Because of wider and broader education, people have learned the value of modern medicine in relieving and preventing sickness. Alcoholism for example, is coming to be regarded as a disease, not simply a crime and bad habit, and venereal disease as an illness, rather than just a punishment for sexual aberration.

All the above stated factors create new problems for the medical profession itself, and for the individual, for his family as well as for the community at large. Hence, the foundations of community life are shaken, and many of the socio-cultural traits are no longer effective. Some of these socio-cultural transformations make the community more susceptible to sickness. So our aim of attaining positive health and health for all by the year 2000, still appears a tantalising idea, difficult to demonstrate but a stimulus to thinking. Since there is a need of a behavioural change towards the above factors, the idea is widespread among the concerned scientists that the advancement in behavioural sciences research field will eventually help the members of the health team to solve some of the major community health problems.

The changing concept of health and diseases

Different scientists have defined health in different ways. In this era of rapid social change, the concept with respect to the causation of disease has also shown global changes. According to Seal (1963), the concept of disease causation evolved by stages from supernatural and deistic origin to the natural and multi-factorial causations. Mahajan (1972) has also emphasised that poor social environment is the main factor responsible for poor health or sickness. Similarly, as brought out by Richardson (1945), profession of medicine progressed from the disease organ to the total personality of the patient, and is now ready for the concept of the individual as a member of a family in its community setting. Keeping in view the changing modern concepts regarding disease causation, a few scientists have repeatedly pointed out the contribution of behavioural sciences to medical sciences.

Behavioural sciences and community health behaviour

As per Park *et al* (1979), the term behavioural sciences is applied to those disciplines committed to the scientific examination of human behaviour. Park has also elaborated that these sciences are mainly Sociology, Social Psychology and Social Anthropology. As per Barelson (1967), these three disciplines have their own history, founding fathers, their own focussed areas of study and perspective of approach. Each shares, however, a common concern to the study of human and community health behaviour and a scientific commitment to account for it.

It is a corroborative fact that the health status of a community is influenced by its cultural traits like customs, habits, values, taboos, mores, folkways beliefs, superstitious ceremonies etc. (Seal 1963 : 119, Leonard 1952:15). Similarly, there are numerous social factors, for instance, family and marriage pattern, Socio-economic status, social mobility, urbanization and industrialization, etc. which are also deeply

linked with the individual and community health status. All the above stated factors determine and modify the community health behaviour. Since some of the above stated milieu are not static, community health behaviour also varies from time to time towards any given practice or innovation.

After independence, Indian health administrators, as brought out by Banerji (1975), directed their appeal particularly towards the then social scientists, engaged in generating behavioural science knowledge to legitimize the existing community structure and social relations. The response was generous. Eminent social and behavioural scientists from the west such as Marriot (1955) and Lewis (1958); and the studies carried out by their Indian disciples like Hasan (1967), Dhillon (1971) Kakar (1977) and Prasad (1972) drew attention to the certain basic social and cultural factors which militate against acceptance of communtiy health practices. In general, as stated by king (1962: 28), there is a sufficient sophistication of theory in the behavioural sciences for its direct application to some of the problems faced by people in the health profession. In the past few decades, as pointed out by Dhillon (1971 : 11), behavioural sciences have grown considerably, evolving a theoretical framework pertaining to human health behaviour. Similarly, Foster (1970:23) has stressed the point that for avoiding disastrous decisions in the field of community health, the knowledge of certain areas of behavioural sciences serve as an accurate map which every health professional should carefully go through, if he is not to get lost, and which will also help him to know his ways around the community.

Keeping in view the existing institutional and domiciliary health care delivery facilities and the low response from the community, the health professionals are beginning to ponder why people behave in indifferent manners than desired by the health functionaries? What makes them more reluctant and hostile towards the adoption of any new health innovation? For answering these questions, public health workers are turning increasingly to those behavioural sciences whose central concern is human health behaviour and the conditions that determine it.

Observations of Leonard (1952) is testimony to the above fact, wherein he reiterated that medicine and public health are strongly and rapidly realizing that the specialised knowledge and techniques of behavioural sciences are required for the proper study of community health needs and their solutions. The above fact is further strengthened by Wahi (1972) that medicine is intrinsically and essentially a social science and as long as this fact is not recognised, we shall not be able to enjoy its benefits.

It is also evident as pointed out by Colfeman (1971), that behavioural sciences can suggest to the community health planners about what type of network of communication is likely to produce better results and for which programme and among what type of people. To them, common to community health and social sciences is human behaviour. Many community health problems are essentially social in nature and thus need social solution. The focus here is on man as unit in community and on the groups human beings form in carrying out their activities. In practice the field has been sub-divided into a number of more or less overlapping with certain fringe areas, which are mentioned below precisely.

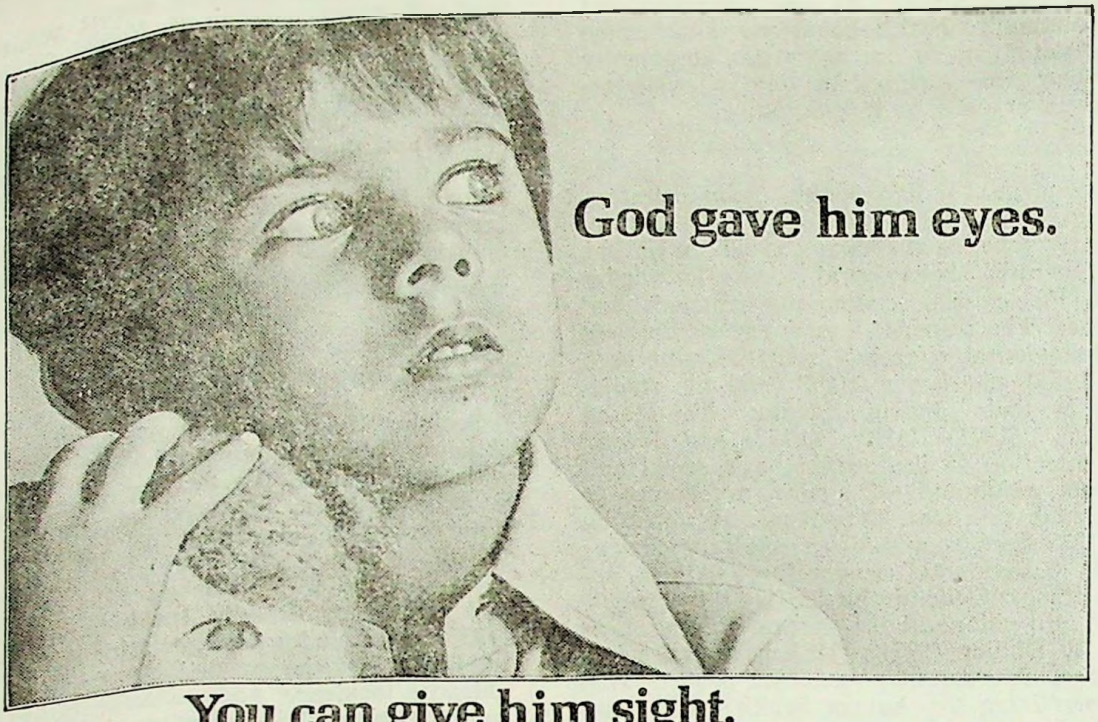
Sociology

Sociology is the science of society which studies situation in which human beings are in relationship with one another. To the sociologist the community is a constellation of social institution such as the basic cultural institution of family, church and school. It also studies situations in relation with illness, and the social principles in medical profession and treatment. Broadly speaking, as cited by Park (1979), it includes the relationship of medicine to public and of the social factors in the etiology, prevalence, incidence and interpretation of diseases, urbanization and its affect on health.

Some of its concepts like social survey, socio-economic status, social pathology and anatomy, and social medicine have very deeply crept into medical terminology and are being frequently used in medical and community health research. Sociology also studies the population problems which are being intensively debated in many parts of the world. Excessive increases in population in certain areas have nullified the results of all developmental plans. Most of these concepts are studied under medical sociology which is a newly developing branch within the field of sociology.

Cultural Anthropology

Cultural anthropology is more definitely a social science, Davis (1943) remarks that if one wishes to know what we may expect of a man, one needs to know in what kind of culture, not in what race, he has been reared. Culture is the central concept around which cultural anthropology has grown. Culture is defined as learned behaviour which has been socially acquired. Culture is the product of human societies, and man is largely a product of his cultural environment. In general, culture transmit the customs, beliefs, laws, religion moral percepts, arts and other capabilities acquired by man as a member of a community. It is now fairly established that cultural factors which govern the human behaviour in every walk of its life are deeply involved in matters of personal hygiene, nutrition, immunization, seeking earlier medical care, family welfare, dis-



God gave him eyes.

You can give him sight.

He can feel a flower but he cannot see it. He has eyes. But he has no sight.

He has his whole life ahead. But his spirit is crushed. By one of the most dreadful inflictions of all. Blindness.

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posal of refuse and excreta, in short the whole health system.

Social Psychology

Puffer (1948) states that in combination with psychology, sociology becomes social psychology, which is concerned with the mental processes and reactions of men in groups of masses. This discipline is on understanding the basis for perception, thought, opinion, attitude, general motivation and learning in individuals and how these vary in human societies and groups. In other words, it deals with the effect of social environment on health personnels, their attitudes and motivations. While planning any health programme, the knowledge of community attitudes and values is essential. Today, almost every member of a health team has to act as a change-agent. His primary responsibility is to bring a radical change in the community health behaviour by discouraging negative attitudes and promoting positive ones. The most of the principles of health education have also been derived from social psychology for achieving the objectives of community health by motivating individuals and groups to change patterns of behaviour as to take such actions, including seeking of medical care, which would enable them to achieve optimum health.

The courtship of medicine and behavioural sciences has begun with honourable intention on both sides. Community health and medicine are concerned, in their own special way, with human and community health behaviour. The field of community health needs the co-operation and help of behavioural scientists in studying problems such as the social components of health and disease, behaviour of people in illness, efficient use of medical care and the study of medical institutions. From the above facts it is noteworthy that the physician and other community health workers need two kinds of knowledge; medical knowledge, and social knowledge, so that they could more effectively serve the patient as well as the community.

People mostly contract infection in the community and not in the hospital. They come to hospital for treatment. So if we are really committed to curb the morbidity and mortality, we must understand the community in depth and the different forces operating in it, which can only be done, if we have a sufficient understanding of the subject matters of behavioural sciences. However, an actual importance of this relationship is beginning to be realized.

REFERENCES

1. Banerji, D. *Social and cultural Foundations of the Health Services of India,* New Delhi; Jawahar Lal Nehru University (1975).
2. Berelson, B. *Human Behaviour,* New York: Harcourt, Brace and Wored, Inc. (1961).
3. Berry, G, "Medical Education in Transition", *Journal of Medical Education,* Vol-28, March, 1953, pp 17-42.
4. Colfeman, J. *et al.* "The Diffusion of Innovation among Physicians' in D.H.S. Punjab (ed), *Sehat,* Dec. 1971, pp-12 (1975).
5. Davis, A, "Racial status and Personality Development". Scientific monthly 17: 354-362, 1943.
6. Dhillon, H. S. "Sociology of Health", Sehat, D.H.S. Punjab, Chandigarh. 1971.
7. Foster, F. M.: *The Traditional Culture and the Impact of Technological change,* New York: Harper and Row Publishers, (1971).
8. Gupta, S.C., "Social-cultural Factors Affecting Child Health", Ph.D Thesis Approved for publication by Punjab University, Chandigarh, 1981.
9. Hasan, K. A., *The Cultural Frontier of Health in Village* in India, Bombay: Manaktalat, 1967.
10. King. S.A., *Perception of Illness and Medical Practice,* New York: Russell Sage Foundation, 1962.
11. Kakar, D. N. *Folk and Modern Medicine,* New Delhi: New Asian Publishers, 1977.
12. Leavell, H, "Medical Progress: Contribution of the Social Sciences to the Solution of Health Problems", *New England Journal of Medicine,* 247:885-897, (Dec-4), 1952.
13. Lewis, O, *Village Life in Northern India,* Urbana: University of Illinois Press, 1958.
14. Leonard, A. S. (1952). *Role of Basic Research in Elucidating Etiology and Prevention of Major Causes of Disability and Death,* New York: Milbank Memorial Funds, 1952.
15. Mahajan, B. K. *Textbook of Social and Preventive* Medicine, New Delhi: Jay Pee Brothers, 1972.
16. Mahler, H. *Traditional Medicine and Health Care Coverage* Geneva WHO, 1983.
17. Marriott, Mckin, *Village India: Studies in the little Community, Chicago* : The University of Chicago Press, 1955.
18. Park J. E. *et al. Text book of Social and Preventive Medicine,* Jabalpur: Messers Banarsi Das Bhanot Publishers, 1970.
19. Puffer, *"Industrial and Occupational Environment and Health"*, Milbank Mem. Fund Quarterly, 26:22-40, 1948.
20. Richardson H. D., *Patients Have Famililies,* New York, Commonwealth Fund, 1945.
21. Seal, S. C., "Presidential Address: 50th Science Congress" in ICSSR(ed). *Social Sciences in Professional* Education, 1963.
22. Prasad, B. G. *Teaching of Community Medicine to Undergraduates in India,* New Delhi : WHO(SEAR), 1972.
23. WHO, *WHO Chronicle,* 1, 12—18, 1975.

LABORATORY MOVES IN THE FIGHT AGAINST MULTIPLE SCLEROSIS

PROF. ALAN N. DAVISON

ALTHOUGH the cause of multiple sclerosis (MS) is not known, there is a great deal of information to suggest it may be the result of the body's own defences attacking the central nervous system.

Defence of the body against attack by foreign organisms or substances is controlled by the immune system, which produces antibodies to fight the invader. However, white blood cells—lymphocytes and macrophages—play a more direct part in immunity.

T-lymphocytes, a particular form of white blood cell, can aid or suppress the immune reaction and so control the progress of the infection. Sometimes the immune response can be harmful, as where white cells attack the membrane lining of a joint in cases of rheumatoid arthritis.

That disease, like MS, has periods of relapse and remission, and certain groups of people are more susceptible than others. This is typical of an auto-immune disease.

A key step in the auto-immune response is recognition of a foreign substance (or antigen) that stimulates the lymphocytes into action and makes them sensitive to it. Activated T-lymphocytes spearhead the defensive attack and release substances that attract scavenging macrophages to the site of the damage. These cells consume the organisms and debris associated with the infection and, finally, scar-or hard, sclerotic tissue-forms at the site of the damage.

Nuclear magnetic imaging

When brain samples from MS patients are examined under the microscope, they often reveal many white cells clustered around blood vessels close to areas of damage. Some macrophages can be seen digesting the fatty insulating material, the myelin, that sheaths the nerve fibres. That is where the scar tissue forms.

Recent clinical studies with a new nuclear magnetic resonance imaging technique have enabled doctors to see that such areas are often near ventricles within the brain. These spaces in the brain contain spinal fluid and are particularly accessible to cells from the bloodstream, suggesting that sensitised cells may act locally to damage the myelin sheath.

A small number of white cells causing this damage migrate through the tissue of the brain or spinal cord and appear in the spinal fluid. Indeed, the presence of white cells and antibodies in the spinal fluid can be helpful in diagnosing MS.

Research workers have found that some of the white cells are sensitised to certain chemical components of the myelin. These components act as latent antigens. The proportion of activated cells is much higher in the spinal fluid than in the blood. It seems, therefore, that the disease originates in the central nervous system where sensitisation occurs. So far, we do not know how this happens. Perhaps a mild viral infection such as influenza or measles, or even stress, can release enough antigen to start an auto-immune response.

Animal disease link

In animals, an auto-immune response and sensitisation of cells to substances in the brain can be produced experimentally. This occurs when we inject a special homogenised mixture of brain and spinal cord into animals. In susceptible animals, paralysis occurs within a few weeks and, as in MS, inflammatory areas are found in the spinal cord and brain.

If certain strains of young animals are injected with the mixture, the resultant disease shows many similarities to MS. As well as damage to the myelin sheaths—demyelination—there are the relapses and remissions of disease activity so characteristic of MS.

Certain long standing infectious animal diseases, such as chronic canine distemper, have some features in common with MS. These conditions are characterised by chronic, progressive, neurological defects together with some demyelination. There seems to be a link between experimental viral infection and the immune reaction, for after infection of the brains of rats with a specific virus, white cells in the blood were found to be sensitised to mylin antigens.

Treatment options

The first problem lies in assessing the treatment. In MS, relapses and remissions cannot be predicted. A few patients progressively become more affected by the disease, whereas many others experience periods—sometimes lasting years—when they are apparently free of symptoms. Clearly an effective drug can be discovered only as a result of a trial on a large number of patients when the drug's action is compared with a placebo, which is something resembling the test drug but not containing medication.

Secondly, there is still the debate about whether MS is an auto-immune disease and about the extent of the malfunction of the immune system.

Since the cause of MS is still unknown, it is difficult to find out whether the disease should be treated by drugs to increase the immune response to an infective agent—immunostimulants—or if immunosuppression is needed to block the cellular auto-immune system.

The use of immunostimulants was based on claims that the white cells of MS patients were powerless in response to the measles virus. As

a result, an extract of normal white cells containing a transfer factor—the factor in the cell that makes it react against infection—was given to patients to stimulate immunity.

Avoiding side effects

After 18 months' treatment it seemed that the disease progression may have been retarded, but only in those with mild-to-moderate MS. On the whole this approach has been disappointing, but there are no reports of the disease worsening following treatment with the transfer factor.

Immunosuppressant drugs block the response of the white cells to antigens, and this can be helpful in the case of auto-immune disease and in the transplantation of organs. Thus immunosuppressants are used to prevent rejection when a human kidney is transplanted into a patient with renal failure, even though every effort is made to match the tissue types of donor and recipient.

There is hope that such treatment may be helpful to patients with MS following research on animals with experimentally induced paralysis. If immunosuppressants are given before the paralysis is established, the animals can be spared many of the harmful effects of the auto-immune disease.

Nevertheless, doctors have had to be very careful in using immunosuppressants on their patients. The side effects may expose patients to infection by impairing their bodies' normal defence mechanisms. Another serious problem is that, because the cause of MS is unknown, the immunosuppressive drug treatment may exacerbate the disease by removing control of a latent infection. Luckily there are no reports of any patients becoming distinctly worse as a result of immunosuppressive therapy.

Diet controversy

Although there have been a number of trials of immunosuppressants, their value is still not conclusively established. Controversy followed reports that eating more foods containing fatty substances, such as linoleic acid, could help slow the progress of MS.

The claim was made that this treatment was most helpful at an early stage of the disease. Since the effects are minimal only a few doctors, mainly in Britain, recommend dietary supplementation with linoleic acid. Trials with more powerful immunosuppressants, azathioprine and cyclophosphamide, showed a slight improvement in the annual relapse rate and progression of the disease.

Since the courses of treatment were relatively short—only 15 months—it could be that treatment would be more successful over a longer period. Trails of immunosuppression are continuing both in the United States of America and Britain, but it is likely to be several years before the place of this form of treatment in the managing of MS is defined.

International effort

Although the results of immunosuppressive treatment are perhaps disappointing so far, interest in transplant surgery has led to new drugs becoming available for future testing.

The discovery by scientists at the Institute of Neurology in London that activation of lymphocytes may occur primarily in the brain presents a challenge to pharmacologists to design substances that will penetrate the nervous system and so block a possible key step in the disease process within the brain itself.

Hopefully, the concentrated research effort in centres all over the world will lead to the discovery of drugs that will suppress the progress of MS. △

New Hope For Arthritis Patients

BETTER treatment for arthritis could come from a technique for observing what happens inside affected joints.

The discovery, made at the Strangeways Research Laboratory in Cambridge, is now in use at Addenbrooke's Hospital near by, and should make it possible to evaluate, for the first time, whether a drug or other therapy improves an arthritic joint or, as some doctors suspect, only worsens it.

Dr John Dingle, Director of the laboratory, said it would be possible also to monitor new drugs for their effect on the disease itself and not just the symptoms.

Explaining the development, Dr Dingle said that joint cartilage was made up of collagen fibres holding a substance called proteoglycan. This had a strong affinity for water and, swollen by it, absorbed stresses and strains as well as lubricating joints.

Lack of proteoglycan resulted in the wear of cartilage and bone typical of advanced rheumatic disease. Proteoglycan, however, was broken down by another body substance, interleukin one, known as ILI. This was a messanger molecule, widespread in the body, which played a role in the immune reaction and in fever, and probably also in tissue repair.

Fragments from the breakdown of proteoglycan survived for a short while in synovial fluid, and the amount could be measured by the technique.

In preliminary trials, 100 arthritic patients had been studied, and all had more proteoglycan than healthy people but could be losing it faster than it was being replaced. The amount increased six-fold from the mildly to the severely affected, providing a sensitive scale for comparison.—*Spectrum*

DIALOGUE ON HEALTH FOR ALL LEADERSHIP

THE Minister of Health and Family Welfare, Shri P.V. Narasimha Rao, has urged upon the health experts to help check deterioration of the health systems in India and to keep alive the concept of health for all which was once all pervasive. Shri Rao inaugurated on 28 July, 1986, the 12-day first "Inter-Regional Dialogue on Health for All Leadership Resource and Network Development" jointly organised by the National Institute of Health and Family Welfare and the World Health Organization.

Shri Rao recounted the role the Indian *vaidya* used to play in olden times when he used to look after the health of the villagers without accepting any fee. His requirements in return were taken care of by the villagers. The knowledge was passed on from father to son. The Minister lamented that the treatment was available now only to those who could afford it. It was not the case, he said, when the ancient system was prevalent in the villages.

Top level policy makers and health administrators, representatives of non-governmental organisations from about a dozen countries and a few experts of the World Health Organization participated in the Conference. The overall objective of the 'dialogue' was to stimulate process for creating and strengthening a network of human and institutional resources for the pursuit of Health for All Leadership Development.

Shri Rao said that he was apprehensive that the present medical curriculum does not instil in the medical students the same degree of commitment and responsibility for health of community members as for hospital patients. He wanted more and closer interaction between the medical colleges/universities and Health Departments of the Central and State Governments. △

An Announcement

First International Seminar on Unani Medicine

The Central Council for Research in Unani Medicine, an autonomous organization under the Ministry of Health and Family Welfare, Government of India, is organizing an International Seminar on Unani Medicine at New Delhi, India from February 13 to 15, 1987. The theme of the Seminar will be "Unani Medicine and the Goal of Health for All by the Year 2000". The Seminar will be examining how best Unani Medicine can be utilized in health promotion with particular focus on the delivery of primary health care, which is the strategy for the attainment of the World Health Organization's goal of "Health for All by the Year 2000". The seminar will review recent advances in Unani fundamental and applied research, including clinical trials. It will also examine the relationship between other systems of medicine and Unani Medicine with regard to the provision of health care to humanity.

The programme of the Seminar will include lectures by distinguished scholars in the field, presentation of recent research papers, discussions and exhibitions.

For further information regarding the Seminar please write to:

Hakim Mohammed Abdul Razzack, Secretary General, First International Seminar on Unani Medicine, Central Council of Research on Unani Medicine, 5 Panchseel Shopping Centre, New Delhi-110017 (India).

LEPROSY ERADICATION PROGRAMME EXTENDED TO 32 DISTRICTS

The leprosy prevalence rate per 1000 population has declined from 16.2 to 4.0 in Srikakulam and from 13.1 to 3.5 in Ganjam district. Noting with satisfaction the perceptible fall in leprosy prevalence rate in these districts chosen for the Multi-Drug Treatment (MDT) under the National Leprosy Eradication Programme (NLEP), the National Leprosy Eradication Board decided at a recent meeting to extend the MDT to 32 highly endemic districts in the country.

The Board, set up to monitor and evaluate the high priority NLEP, decided to introduce Multi-Drug Treatment of leprosy cases in five low endemic districts on an experimental basis involving primary health care staff. Multi-Drug Treatment will be extended to dapsone refractory cases in every district under dapsone monotherapy. Laboratory services will be strengthened by creating additional posts of technicians in all MDT districts. In Lakshadweep, all leprosy cases will be brought under Multi-Drug Treatment to arrest disease activity by 1988-89. The Board also directed the Central Leprosy Training and Research Institute, Chingleput to step up monitoring and evaluating activity.

The meeting was chaired by the Health Secretary, Shri S.S. Dhanoa. Other members of the Board included Union Secretaries of Finance, Planning, Welfare, Rural Development and Information and Broadcasting.

——**P.I.B.**

BOOKS

Minimum-Needs Programme : A Qualitative Assessment. Muthayya, BC., Aneesuddin, M. and Azad, GS. Journal of Rural Development 1986 Mar; 5(2): 191-240.

The minimum-needs pogramme (MNP) was initiated as a separate programme in the Fifth Plan to improve the living conditions of people in the rural areas especially those who are below poverty line. This study covering six villages in Nagpur and Akola Distt. of Maharashtra, examines the type of impact this programme has made on the conditions of living of people. Among the eight components of MNP, only seven, viz., Rural Roads, Housing for Rural Landless, Rural Electrification, Elementary Education, Rural Water Supply, Rural Health, and Nutrition are implemented in the study. Impact factor varies in each of the seven components of the MNP in these villages. For instance the water facilities provided in the study villages have created a positive impact among the villagers. They felt happy about its easy accessibility and contribution to improvement in health. The assessment of the various aspects of the health programme, viz., family planning, mother and child care, preventive and curative medicine revealed that these services have been successful to some extent in fulfilling their task as evinced by relatively low birth and death rates in the study villages. As for general medical facilities the position has improved as now they don't have to depend on private doctors who charge exhorbitant rates nor had to travel distant places even for the treatment of ordinary ailment. Services of the Village Health Guide though deemed essential are considered inadequate by most of the respondents.

In the area of nutrition, the Balwadi Scheme for pre-school children and the milk scheme for the primary school children, do not seem to have created any perceivable impact on the beneficiaries. Adequate resources and proper planning of implementation are required to make the programme effective.

Lack of peoples' participation was found to be the major stumbling block in the maintenance of the different facilities under the MNP. Some percentage of total budget under the programme be allotted for the maintenance, renovation and improvement of the physical infrastructure developed through the different schemes under the programme.—*National Medical Library*

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