Second Handbook on Healthcare

Prevention of Common Diseases

Trust for Voluntary Organizations

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Trust for Voluntary Organizations (TVO)

The Trust for Voluntary Organizations was established in 1990 in pursuance of an agreement between the governments of the US and Pakistan. The purpose was to create an independent indigenous grant-making agency for the assistance and support of NGOs engaged in participatory development. The Trust also provides assistance for the capacity building of NGOs and has, recently, undertaken dissemination of information as part of capacity building programme for its partner NGOs and the communities that they serve.

So far the Trust has disbursed more than Rs. 700 million out of its own funds and the funding provided by the European Commission under a five-year agreement that would conclude in 2003. The grants have been provided in the field of Primary Education, Primary Health (including reproductive health), Poverty Alleviation and Rehabilitation of the Disabled.

The Trust operates through its 20 regional offices and a network of CBOs (more than 300) that extends to each sub-district (tehsil) of Pakistan. However, NGOs/CBOs that are not part of this network are also eligible for support by the Trust.

Acknowledgments

Out of many books consulted while writing this Handbook, the following were particularly useful: Preventive and Social Medicine, by J.E. Park, Community Medicine, by Prof. Hassan Ashfaq Siddiqi (editor), and Where There is No Doctor, by David Werner with Carol Numan and Jane Maxwell, published by the Hesperian Foundation, Berkeley, California.

Mr. Zaigham Khan had done the proof-reading, and spotted many mistakes made in the first edition. Ms. Fozia Shoaib has done the word processing with her usual competence. This edition has also been embellished with illustrations by Mr. Akhtar Shah, a well-known cartoonist.

Introduction

Preventive medicine is as old as the curative medicine or, maybe, even older as formulation of cure requires observation, experiment, and selection of the curative material out of hundreds of thousands of herbs and chemicals, whereas knowledge of prevention can be based only on observation. The great physicians of the antiquity were, therefore, aware of the primacy of prevention in their system of medicine. The Chinese, who evolved an organized system of medicine more than 2000 years ago, have a saying that ' a great doctor is one who treats not someone who is already ill but someone not yet ill'. Hyppocrates (469-370 BC) who initiated the scientific approach to medicine and is known as the 'Father of Medicine' in Europe, laid great emphasis on discovery of the causes of disease, and studied climate, clothing, diet and habits to establish the relationship between such factors and disease. The theory behind this practice was that if we know the cause, we can control the effect i.e. the disease. Thus, the foundations of preventive medicine were laid more the 2000 years ago in Europe, Asia and Africa by the great physicians of the ancient world.

In modern times preventive medicine took a quantum leap forward in the year 1754 when James Lind, a British naval surgeon, published A Treatise on Scurvy in which he recommended that fresh citrus fruit and lemon juice be included in the diet of seamen to eradicate scurvy from the British navy as more sailors were dying of scurvy thon of warfare. Later, in another book, he also suggested delousing to combat typhus. Both scurvy and typhus were, thus, successfully eradicated from the ships.

Later, in the 19th century, preventive medicine made spectacular advances with the discovery of anti-rabies vaccine by Pasteur in 1883. That was followed by cholera vaccine in 1892, diphtheria anti-toxin in 1894, typhoid vaccine in 1898, and antiseptics, and disinfectants during 1827 to 1912.

Great advances were made also in the knowledge of the mode of transmission of disease during the last decade of the 19th century. Bruce proved in 1898 that African sleeping sickness was transmitted by tsetse fly; Ross demonstrated in 1898 that malaria was transmitted by mosquitoes. Thus grew the science of bacteriology that gave insight into the mode of transmission of disease, and it became possible to

prevent diseases by blocking the channels of transmission through such means as purification of water, protection of food from flies and rats, proper sanitation, and destruction of disease-bearing insects.

Advances in preventive medicine continued with the introduction of anti-viral vaccines, such as polio vaccine in 1960. Eradication of smallpox is, of course, the greatest triumph of preventive medicine. No case of smallpox has been reported since 1977 when the last case was reported in Somalia. Eradication of malaria has not been achieved, but eradication of some other diseases, such as measles and tetanus, is expected to be achieved. With numerous other advances in medical technology, we can expect many other spectacular achievements in disease prevention within no more than a few decades. Of the new technologies, genetic engineering alone has vast potential that has yet to be understood.

It is a paradox of our times that despite unprecedented development of the medical science, people, especially in the developing world, remain ignorant even about such matters of medical care that Hippocrates talked about more than 2000 years ago. This situation can be rectified only through health education. Hence these handbooks.

The purpose of this handbook, the second in the series, is to provide information about the causes, modes of transmission, and methods of prevention, of common diseases, and thus demystify the pathology of disease. This should enable those who do not have access to proper medical services to prevent some of the diseases, to some extent, and to dispense with the services of quacks, con men, fake healers, and unscrupulous physicians, to some extent, if not entirely.

Finally, it needs to be emphasized that this handbook is about prevention of disease, not about treatment or cure of diseases. Proper treatment of the patients must, therefore, be provided by a qualified doctor.

Chapter

Causes of Disease

Causes of Disease

Disease may be described as a consequence of interaction between a *host* (person), an *agent* (germ, heat, cold, deficiency etc), and *environment* that has three different elements, that is, physical, biological, and social. The host needs no explanation as it is, in the present context, always a human being. The other two elements need some elaboration. A brief description of each of the other two elements is given in the following paragraphs.

Agent, the basic cause of disease, is not necessarily something that is introduced into the human body from outside. It can be something that is produced within the body as a result of numerous possible malfunctions, such, as malfunction of liver, thyroid or kidney. Various categories of agents are as follows:

Biological Agents These are the agents of infectious diseases that enter into the body through air, water, food or insect bites, and can be anything from worms to virus. They have the ability to multiply within the human body which enables them to weaken or even overcome the defensive mechanisms of the body, and disrupt one or many bodily functions.

Nutrient Agents An excess or deficiency of any kind of nutrition (protein, fat, carbohydrate, vitamins, minerals, water or even sunlight) can cause nutritional disorders that have been mentioned in Part-II of the First Handbook. Protein and vitamin deficiencies are common in Pakistan. Amongst mineral deficiencies, the more common are those of iron and iodine.

Physical Agents Heat, cold, dust and humidity are the more common physical agents, but there can be other agents as well, such as, sound. Too much of frequent noise can cause health problem like irritability and lack of sleep.

Chemical Agents These can be of two kinds: those produced in the body, for example, urea, stones in the kidney or bladder; and those that enter the body from outside, such as noxious gases,

insecticide or pesticide that industrial or agricultural workers can inhale in the course of their work. Tobacco smoke, drugs and alcohol are the more common sources of chemical agents.

Psychological Agents These may take many forms, and cause many mental disorders. These are usually related to actual or perceived deprivation of somekind e.g. loss of parents, property or employment. It effects the bodily functions and can lead to such serious diseases as cancer or schizophrenia.

Environment is the third component of disease-causing interaction. It can be defined as all that exists outside a human being with which constant interaction takes place. Since that would include all living and non-living things, it would include the *agents* as well. It needs to be clarified, therefore, that environment as the third factor is that part of the environment which provides the setting for the interplay between the host and the agent. However, the environment as a setting is not neutral. It can strengthen or weaken the host (e.g. through cold or heat), or strengthen or weaken the agent(e.g. damp and dark place provide good breeding ground for mosquitoes and sunlight kills germs), and, thus, play a significant role both in the spread and eradication of disease. For the purpose of description, the physical environment can be divided into three categories that are as follows:

Physical Environment All non-living things that surround a human being constitute the physical environment. it includes air, water, climate, heat, light, noise, house, and streets etc. There are some elements of the environment(e.g. climate) that are beyond human control. We cannot change the climate but we can protect ourselves from its adverse effects. Then, there are other elements of the environment that we can change, but we often do that to our own disadvantage. The most common examples of such changes are pollution of water or air through human activity. This is where we need to create awareness about the health-hazards caused by human activity, and take corrective measures to restore the natural purity of the environment

Biological Environment This includes all living things that surround a human being, including other human beings. As pointed out earlier this would also include the biological agents of diseases such as worms, germs and viruses. But since the nature and role of agents is being considered separately as one of the three elements that interact to produce disease, we will consider here only that part of biological environment that may give birth to, sustain, or carry an agent, but is not an agent itself. This would, include animals, insects, plants, trees and biological waste etc.

Social Environment This includes local customs, practices, beliefs, lifestyles, health services etc. Some of the myths or superstitions have direct bearing on health, such as exorcism of evil spirits from human body through exposing the face of the person, believed to be possessed, to red-pepper fumes. Social environment that is conducive to prevention or treatment of disease would include provision of medical services or health education, and enlightened civic sense of the members of a community.

To sum up:

Disease is caused by interaction between human beings, agents of disease, and an environment conducive to emergence or transmission of disease. Disease is not caused by magic, evil-eye, or curses.

Agents of disease can be biological (e.g. germs, virus), nutritional (e.g. lack of protein, excess of fat), physical (e.g. heat, cold), chemical (e.g. stones in the kidney, noxious gases), or psychological (e.g. sense of deprivation).

Environment, the third factor, can be physical (e.g. air, water), biological (e.g. animals, plants), or social (e.g. customs, beliefs, medical services). It can strengthen or weaken the host through, for example, clean air that strengthen or contaminated water that weakens. It can also strengthen or weaken the agent through, for example, dampness that breeds mosquitoes or sunlight that kills germs.

Chapter 2

Infectious Diseases

Infectious Diseases

Broadly speaking diseases can be classified into two main categories: infectious diseases that can be transmitted from one place or person to another; and non-infectious diseases that are not transmittable from one place or person to another. Some basic information about infectious diseases is given in this chapter, and about the non-infectious diseases in the next chapter. Knowledge of these basic facts would enable individuals and communities to take preventive measures.

Infectious diseases are caused by germs (bacteria, virus, parasites etc) that can spread from one host (person) to another. In case such a disease assumes the virulence of an epidemic, a whole community can be affected. These germs are found in soil, water, air, plants, food, animals, and human beings. In short, the agents of infectious diseases are everywhere, but most of them are found within the human body itself and transmitted from infected persons to other persons.

The germs enter into the human body through any of the seven different routes, that is:

Air When a person suffering from a respiratory disease, sneezes, coughs, spits or talks, a large number of germs (e.g. of measles, diphtheria, whooping cough or T.B) are exhaled into the air, and can be inhaled by another person.

Water Drinking of, or even bathing or washing with, contaminated water can infect a person with the waterborne germs of such diseases as diarrhoea, dysentery, typhoid or hepatitis.

Food Eating contaminated food can infect a person with the germs of such diseases as food poisoning and also the diseases caused by contaminated water.

Fomites Since anything can get infected, the article of daily use, such as towels, books, clothes, door handles, if used by an infected person, can infect the other users of such articles. Such infected articles are called fomites.

Syringes and needles A syringe or a needle infected with the blood of a person suffering from such diseases as AIDS, hepatitis, syphilis or malaria may result in the transfer of infection if used again on another person. Same thing will happen in the case of transfusion of infected blood.

Insects Germs of a disease can enter the body of a person by the bite of an insect like mosquito or mite. Germs can also be deposited on food and drinks by flies.

Direct Contact Germs can also enter a body through direct contact with an infected person. In such cases germs enter through the skin or the mucous membrane, and can cause diseases like rabies, leprosy, syphilis or gonorrhea.

Once the germs of a disease have entered a body, they tend to multiply and proliferate if allowed to establish themselves in the body of the new host. But if the body is immune to the disease the germs will not proliferate due to the antibodies in the blood which attack and destroys any substance that is alien to the body, such as bacteria or virus. Immunity is of two kinds i.e. natural and artificial. The natural immunity depends upon racial, regional or even family characteristics, and is also transferred from the mother to the child. Hence most of the infants remain immune to infections up to the age of 3 to 6 months. Immunity is also produced if a person has once been infected by a disease. This kind of immunity may be permanent as in the case of measles, or temporary as in the case of typhoid. The artificial immunity is the one that is created in the body through vaccines.

Infectious diseases include six diseases for which WHO recommends vaccination in childhood. These six diseases are: tuberculosis, diphtheria, whooping cough, tetanus, polio and measles. The process of giving all of these vaccines can be

completed in one year, and should be completed before the age of five years. The facility of vaccination for these six diseases is available in government hospitals and health centers. From the year 2001 vaccination for hepatitis B has also been included in the Expanded Programme on Immunization (EPI) to provide protection against seven diseases. There are vaccines for some other diseases also, but the immunity provided by them is only for a short duration. A general immunization for those diseases is, therefore, not recommended.

Infectious diseases may be classified into seven different groups, depending upon from where the diseases originate. The following are more common infectious diseases in each group:

- Infection originating from human respiratory system: *chickenpox, influenza, measles, meningitis, mumps, pneumonia, tuberculosis and whooping cough.*
- Infection originating from human intestines: *cholera, diarrhoea, dysentery, hepatitis, polio, typhoid and worms in the intestine.*
- Infection originating from human eyes: *conjunctivitis and trachoma.*
- Infection originating from human blood and semen: *AIDS and herpes*
- Infection originating from animals: *food poisoning, rabies*
- Infection originating from mosquitoes: *malaria*
- Infection originating from rats: *plague*

The symptoms and the ways of prevention of the diseases of each of these groups is explained in the following section of this chapter.

Diseases originating from human respiratory system:

1.Chickenpox Symptoms of this disease begin to appear with a mild fever, pain in the back, shivering and weakness. After two or three days rash may appear, though in the case of children rash is often the first symptom. The rash first appears on the trunk and later on the face, arms and legs as well. In the next stage vesicles are formed. They are filled with clear fluid and look like dew-drops on the skin.
As a preventive measure the patient should be isolated till the last scab has fallen away, oro-nasal secretion should be disinfected, and clothing and utensils used by the patient should be sterilized.

2.Diphtheria Patients usually have sore throat, difficulty in swallowing, and fever. Fluid that seeps out from the site of infection forms a yellowish membrane at the site of infection. More usual sites of infection are the throat, tonsils, trachea and larynx.

Since the germs of diphtheria are usually contained in the nose or throat of the infected persons, the disease can spread through airborne germs released in the process of coughing or expiration, or through transfer to cups or spoons etc in the process of eating.
The only effective method of prevention is immunization through diphtheria vaccine which should be administered to infants as early as possible, preferably before they lose their natural immunity inherited at birth.

3.Influenza It begins with high fever, pain and weakness in the limbs, and is followed by such respiratory discomfort as coryza and bronchitis. These symptoms last for about three days, and full recovery takes about a week. Influenza is, thus, not itself a severe form of disease, but it can lead to complications. The most dangerous form of complication is pneumonia which should be suspected if fever continues for more than 4 or 5 days or recurs after recovery. The disease can be fatal in patients of old age or those already suffering from some other disease.
The germs of influenza are contained in the nasal and the respiratory tract and are usually spread through the breathing or coughing of the patient. Since the germs are airborne, the infection spreads quickly in places where there is overcrowding.
All measures to control the spread of influenza have so far failed. The only precautions that are feasible are good ventilation of houses and public buildings, and avoidance by the patients of crowded places. It is advisable for the patients to cover their mouths when coughing or sneezing, and to stay at home during the first 5 days.
Although there are many vaccines for influenza but none is effective due to emergence of new strains because of its global and frequent occurrence.

4.Measles It is a highly infectious disease of childhood indicated by fever, coryza, bronchitis, laryngitis, running nose and eyes, and photophobia, for the first three days. On the fourth day a pinkish rash appears all over the body and purplish white spots develop inside the mouth and gums. Death may result in children below the age of two years. The complications can be prevented by use of antibiotics that should be prescribed by a qualified doctor.
Since the virus of measles cannot survive outside the human body, the only source of infection is a person suffering from measles. Hence, everything used by the patient should be sterilized.
Immunization against measles through vaccination programme recommended by WHO that also includes 5 other diseases, is safe, effective, and easily accessible. WHO recommends vaccination at the age of 9 months. However, if there is an outbreak of measles in a community, this age can be lowered to six months, but in such cases a second dose should be administered as soon as the child reaches the age of 9 months, but not before one month after the first dose.

5.Meningitis It begins with intense headache, vomiting and rigidly of neck, and results in comma within few hours. It is a disease that occurs mostly in children and

young persons, and usually in the dry and cold months of year. Overcrowding and poor sanitation quickens the pace of the spread of infection. Lack of proper treatment can cause death in 80% cases.

Treatment with antibiotics is effective, and can save the life of the patient if started during the first two days of illness. Its prevention and control is possible if the oro-nasal secretions of the patient are disinfected, and clothes sterilized. The patient should be isolated till the symptoms disappear.

In case the disease has spread in an epidemic form in any community, it is an effective precaution for the inhabitants of the area to keep their throats free of infection by antiseptic gargles.

There are vaccines for meningitis but not for all kinds of its viruses. Further, the vaccines are not effective in children below the age of two years, and the duration of immunity is only three years. It is better, therefore, to take other preventive measures whenever there is a case in the locality.

6.Mumps It begins with fever which is followed by enlargement of the salivary glands, that causes difficulty in opening of mouth and pain at the point where the upper and the lower jaws are joined. If not treated quickly it can lead to complications that may involve genital organs, eyes, pancreas and the nervous system. The disease tends to be more severe in adults than in children, but generally involves children. One attack of mumps gives life-long immunity.

Mumps is generally an endemic disease and can occur at any time, and is more likely to occur during the winter and spring. It spreads through germs exhaled by an infected person or direct contact with the patient.

Prevention and control is possible through isolation of the patient for 9 days after the glandular swelling, disinfection of the nasal and oral secretion of the patient, and sterilization of the clothes and utensils used by the patient.

Immunity is possible through vaccination for mumps or through a combined vaccination for measles-mumps-German measles (rubella).

7.Pneumonia It is an acute infection of the lungs, and often follows other respiratory diseases such as measles, influenza or whooping cough. It is indicated by

sudden chill followed by high fever, rapid breathing, yellow or greenish cough and pain in the chest.
The infection spreads through contact with the infected mucus or saliva, or through inhaling the airborne germs released by an infected person while coughing or sneezing.
Prevention of disease is possible through improved sanitation, better nutrition, and reduction of smoke pollution indoors. Treatment with antibiotics is effective, and immunization through vaccine is possible, though for a short duration.

8.Tuberculosis It is indicated by low fever in the evening, loss of weight, weakness, cough without expectoration, perspiration at night and, at later stages, blood in the sputum.
The disease spreads through airborne germs released by an infected person while exhaling, sneezing or coughing, or through sputum or saliva. Its incidence is higher in cases of malnutrition and overcrowding.
The best protection against tuberculoses is immunization through vaccination, BCG, which is part of the Expanded Programme on Immunization, mentioned earlier. Other measures that can be taken to control tuberculosis are the same as for other viral diseases of the respiratory system, and are summarized at the end of this section.

9.Whooping Cough It is indicated by sneezing and coryza followed by bouts of cough with a characteristic 'whoop.' The best defence against the disease is immunization. It is one of the six disease that are covered by the Expanded Programme on Immunization. Measures for the control and prevention of whooping cough are the same as for other infections of the respiratory system, and are summarized below.

Preventive measures for respiratory infections:

There are a number of measures that can be taken to prevent the spread of all or any of the nine more common diseases that fall in this group.These measures are:

- The patient should be separated from others to protect them from infection. If the patient has not been admitted in a hospital, he should be confined to a separate room. Since this may not be easy in a small house, the bed and things used by the patient should be disinfected once a day, and al

other persons living in the room should wash their hands with an antiseptic lotion or soap, or with hot water, after every contact with the patient.

- Where feasible, windows and ventilators should be kept open.
- Clothes, linen and utensils used by the patient should be soaked in water with antiseptic lotion or boiled in water or, at least, dried in the sun.
- There should be a container with a lid to receive the vomit, sputum, and used tissue paper. The container should have a disinfectant lotion.
- If antiseptic lotion is not available, things used by the patient which are no longer required should by burnt after spraying with kerosene oil.
- Anti-fly measures should be taken inside the house to prevent contamination of food and utensils. In case the disease has assumed epidemic proportions, the whole community should take steps to eliminate flies.
- Since the germs of these diseases are found mostly in the throat, antiseptic gargles can be a good preventive measure.
- Immunization through vaccination is the best prevention in the case of six diseases included in the EPI i.e. tuberculosis, diphtheria, polio, measles tetanus and whooping cough. Vaccination for hepatitis is also now available under the EPI.

Diseases originating from human intestine:

1.Cholera It usually begins with headache and nausea and is followed by loose motions and vomiting, both of which assume rice-water appearance after two or three days. This leads to rapid dehydration, muscular cramps and suppression of urine. Unless there is quick replacement of fluid it can be fatal.

The germs of cholera spread through infected water and food. Houseflies are the most common carrier of germs. Flies fed on infected food or feaces can remain infective for as long as two weeks.

The global experience shows that cholera occurs only in areas where sanitation is poor. Hence control of cholera is possible through; (i) use of clean water for drinking, washing and cooking, (ii) food sanitation through cooking, eating and keeping food under hygienic conditions and, (iii) through disinfection of places and of articles of daily use that may be suspected of having been contaminated. During an epidemic water and milk must be boiled before use, food should be protected from flies, and vinegar and lemon should be used three or four times in a day as they produce acidity in the stomach that kills the germs of cholera.

Oral Rehydration through ORS is the best and simplest treatment till proper medical care is made available. Though cholera is included among vaccine preventable

diseases but in view of short duration of immunity, cholera vaccine is not of much value.

2.Diarrhoea It is indicated by frequent watery stools, and is more common and more dangerous in undernourished children. It is one of the major killers of children in Pakistan where more than 70,000 children die of diarrhoea every year.
Symptoms of diarrhoea are similar to that of dysentery, but it is easy to distinguish the one from the other. If a person has loose or watery stools, it is a case of diarrhoea, if there is mucus or blood in the stool, it is a case of dysentery.
The major cause of this disease, as of other diseases originating from the intestine, is bad sanitation.
Usually no medicine is required if the patient has been given Rehydration (ORS) drink.

3.Dysentery It begins with loose motions and, later, there is mucus and blood as well in the stool. Dysentery is of two kinds: amoebic and bacterial. Bacterial dysentery can be distinguished from the other dysentery by greater frequency of stools and fever. Since the germs of this disease are evacuated with the stools, it spreads through contamination of water and interplay between feaces, flies, and fingers. Flies play an important role in transmitting the germs from the feaces to food.

Prevention of dysentery can be effective only through proper system of sanitation, both in the houses and in the streets. However, there are some other measures that are summarized at the end of this section.

4.Hepatitis There are at least five different kinds of germs that can cause hepatitis (an infection of the liver) which, in the first phase, is indicated by fever, abdominal discomfort, fatigue, pain in the joint, vomiting and diarrhoea. In the second phase when the damage to the liver has begun, the patient feels pain near the liver, and there is yellow discolouration of the skin, conjunctiva, and urine.
Hepatitis A and E virus is spread through contaminated food and drink, and hepatitis B and C viruses are spread through blood, breast milk, saliva, semen and tears.
At present there is no vaccine for hepatitis A, C and E. Immunization against hepatitis B is effective through easily available vaccine. It is given in three doses, and also provides protection against hepatitis D which always occurs in association with hepatitis B.

The only way to protect the population from this infection is to protect the water supplies, and take other measures for hygienic living conditions, described in detail in the First Handbook. The patients who show signs of this disease should be isolated for the first seven days as the disease is most infections during that period.

5.Polio The disease is indicated by initial symptoms that are common to other viral diseases, such as weakness, vomiting, headache, sore throat, abdominal pain and fever. It is followed by signs of paralysis that usually involves the limbs.
It is caused by virus that first reaches the nose and throat and then passes on to the intestinal tract, and are evacuated through the feaces. Some viruses pass in the blood stream and attack the nervous system.
Immunization against polio is effective and is part of EPI. But once the disease has been caused there is no treatment except physiotherapy, which can significantly reduce the severity of paralysis. Prevention and control is possible through measures that would be summarized at the end of this section.

6.Typhoid Main symptoms of typhoid are continuous fever that lasts for many days, and falls gradually. It is spread through faeces and urine of patients or carriers either directly by soiled hands or indirectly by ingestion of contaminated water, food, or through flies.
Immunity against typhoid is possible through vaccines of which there are four varieties. However, none of the vaccines provides immunity for more than three years. The other measures for prevention and control are the same as for the other viral diseases of the intestine, and are summarized at the end of this section.

7.Worms These are the parasites that live in the intestine where they move freely. Their eggs are often passed out along with the stool. More common among these are the roundworm, threadworm, whipworm and tapeworm. Some basic information about these worms is as follows:

Roundworm. These are 20 to 30 cm. long, either white or pink in colour. Through lack of cleanliness they pass from one person's stool to another person's mouth. Once the eggs are swallowed, young worms hatch and enter the blood stream, and finally reach the intestine where they grow to their full size. These worms can cause discomfort, indigestion, anaemia and weakness. Children with roundworms have large and swollen bellies.

Whipworm. These are 3 to 5 cm. long and pink or grey in colour. These worms can cause diarrhoea.

Hookworm. These are 1 cm. long and red in colour, cannot usually be seen in the stool. Hookworm infestation can be a very damaging disease of childhood as it can cause severe anaemia.

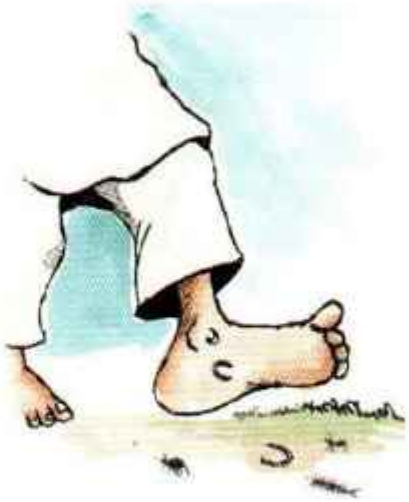
Tapeworm. These worms can grow several meters long, and are the largest worms found in the intestine. Their main sources are improperly cooked beef, meat or Fish.

The only long-term preventive measure, apart from general cleanliness, is installation of sewage system in urban areas, and of sanitary latrines in rural areas.

Preventive measures for intestinal infections:

Since the source of infection and its spread is similar in all the intestinal infections, there are some common measures that would be effective for control and prevention of all the diseases in this group. These measures are:

- Immunization against polio and hepatitis through vaccination is effective, and is included in the EPI. All children must be provided immunization.
- Hands should be washed whenever soiled and before eating.
- Water supplies should be protected and drinking water should be boiled and, preferably, filtered before use.
- Food should be protected from flies.
- Attention should be paid to proper sanitation, and latrines should be screened against flies.
- Milk should always be boiled before use.
- Patient's clothes, linen and utensils should be boiled in water.
- Latrines should be disinfected with Lime, once a week. Food, especially meat and fish, should be properly cooked leaving no raw spots.
- Going about barefoot, especially by children, should be discouraged. Many germs, like that of hookworm, enter the body through a person's bare feet.



- Wash the vegetables and fruits well, and cut off decaying and stale portions.
- Do not eat meat or fish or any food that smells bad.

Diseases originating from the eyes:

There are two very common infectious diseases of the eyes that spread from the eyes of an infected person to the eyes of another person. These are: conjunctivitis and trachoma. Basic facts about the cause and spread of these two diseases are as follows:

1.Conjunctivitis It is indicated by redness, pus and mild burning sensation in one or both eyes. Eyelids often stick together during sleep. It is especially common in children.

It is a very contagious disease as the infection easily spreads from one person to another through direct contact, use of common towel, or use of pillow used by the infected person.

Prevention is simple: Do not let a child with infected eyes play or sleep with others or use the same towel or pillow. Wash hands after touching the infected eyes.

2.Trachoma It is a chronic infection that slowly gets worse, and may last for years. If not treated in time it can cause blindness. It is indicated by red watery eyes, as in the case of conjunctivitis, followed by pinkish gray lumps, called follicles, that are formed inside the upper eyelids. Children from age of two to five years are most likely to be infected. Infection is worsened by dust, smoke, and use of *Kajal* or *Surma*.

The infection spreads through the secretions from the eyes and nose of the patient and reaches other persons by use of infected towels, soap, handkerchiefs.

For the purposes of prevention and control, the following measures should be taken:

- patients should wash their hands and face regularly with an antiseptic soap;
- towels, pillows and handkerchiefs of the patients should by sterilized after every two or three days, and should not be used by other persons; and
- patients should avoid touching their eyes with their bare hands.

Diseases originating from human blood and semen:

1.Acquired Immune Deficiency Syndrome(AIDS) It is a fatal disease which breaks down the body's natural immune system, leaving the body vulnerable to all sorts of diseases and disorders. The virus of this disease (HIV) can remain dormant for years before becoming active.
Major indications of the disease are loss of weight, chronic diarrhoea, fever for more than a month. Since the disease weakens the immune system, other diseases of skin, respiratory system, and of the nervous system may also appear. However, presence of the disease can be confirmed only by a proper test, as the symptoms can be very confusing and even misleading.
Since the virus of this disease is present mainly in the blood and semen of a patient, it can be transmitted mainly through sexual contact with an infected person, transfusion of infected blood, or administration of intravenous injection with infected needles. This clearly indicates what the preventive measures should be i.e. all the three main ways of transmission of the virus should be avoided.

2.Herpes It is indicated by fever followed by localised pain in the genital region. In males vesicles, with or without ulcers, form on the genital organ. In case of females it causes leucorrhoea as well.
Since this disease needs to be distinguished from some other diseases having similar conditions, diagnosis though pathological tests is necessary. The preventive measures that are possible are the ones that have to be taken by the patient himself as this disease spreads though sexual contact. The preventive measures to be adopted by the patient are as follows:

- since the ability to infect lasts till skin lesions are present, the patient should not indulge in sexual activity during that period;
- the genitals should be washed with antiseptic soap; and
- fomites, such as clothing, linen, towels etc used by the patient should be sterilized.

Diseases originating from animals:

1.Food poisoning Food poisoning is of two kinds: (a) bacterial, and (b) non-bacterial. Non-bacterial food-poisoning is caused by chemicals (e.g. insecticides or pesticides) and poisonous plants. Since non-bacterial food-poisoning is not infectious, it is not being discussed here.
The most common form of bacterial food-poisoning, which is infectious, is caused by germs which primarily originate from farm animals and poultry, through infected meat, milk, milk products and eggs. Rats and mice are another source. They spread infection by contaminating food by their feaces and urine.

The onset of the disease is usually sudden with fever, chill, nausea, vomiting, and diarrhoea that can continue for many days. Prevention of food-poisoning can be largely effective through these measures:

- diseased animals must not be slaughtered for meat;
- meat, fish and eggs that smell bad should never be eaten;
- milk should always be boiled before use;
- meat should always be cooked properly, leaving no uncooked portion; and
- food should be protected from flies, insects and rats.

2.Rabies It is also known as hydrophobia, and is a fatal viral disease of the central nervous system. It is primarily a disease of warm-blooded carnivorous animals such as dogs, cats, wolves and jackals. Its virus is found in the saliva of the infected animal, and is transmitted to man by the bites or licks of rabid animals. Chances of infection are greater if the bite is over the naked skin.
The onset of the disease is quicker if the bite is nearer to the head, and is indicated by spasms of the muscles of the throat that causes difficulty in swallowing. Later, the spasms increase in frequency and at the sight of water and other liquids. In the final stages there is great agony and paralysis of the muscles.

In case a person is bitten by a dog or a cat, following steps should be taken:

- the wound should be washed with soap and water for about 10 minutes;
- articles coming into contact with the saliva of the patient should be disinfected;
- if there is slightest suspicion of the dog or the cat being rabid, the course of anti-rabid vaccine should be started immediately; and
- as a general precaution domestic dogs and cats should be vaccinated, and stray dogs put to sleep.

3.Tetanus The disease is characterized by muscular rigidity with spasm of voluntary muscles (indicated by lock-jaw), facial muscles, muscles of the back and neck, and of the lower limbs and abdomen. Death usually occurs due to cardiac failure or suffocation due to contraction of the respiratory muscles.

The germs of tetanus are found in the intestines of many herbivorous animals like cattle, horses, goats and sheep, and are excreted in their feaces: the germs thus released survive for long periods in the soil or dust, and can be transmitted from one place to another by flies as well. The germs enter into the human body through cracked skin, due to wounds or otherwise, and are not directly transmittable from man to man.

The most effective way to prevent the disease is through vaccination which is included in the EPI. The other measures to prevent the occurrence of this disease are:

- animal excreta should not be allowed to stay and rot on the streets.
- untreated animal excreta should not be used as manure.
- going about barefoot, especially by children and by persons having a wound, should be discouraged.

Diseases originating from mosquitoes:

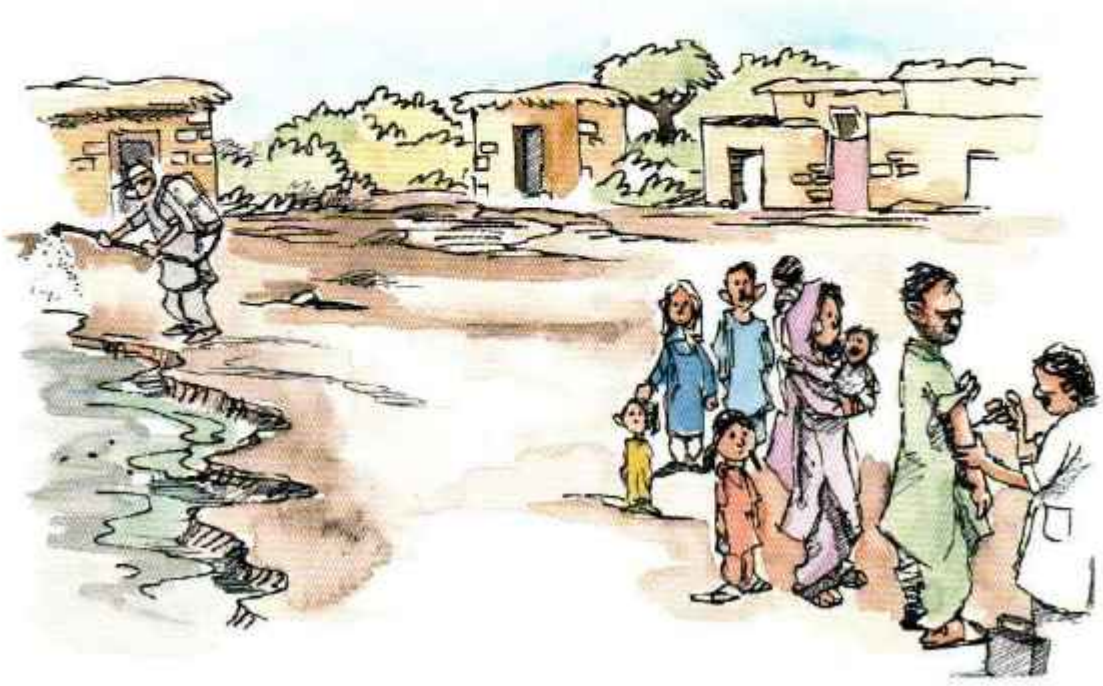
There are two diseases that are caused through mosquitoes: malaria and dengue. Malaria is more common of the two diseases. When a female mosquito bites a person, it injects along with its saliva a large number of germs that attack the cells of the liver.

Malaria begins with headache and nausea, and feeling of cold to such a degree that the patient may shiver even when covered with blankets. After a few hours patient feels hot, temperature rises, and the headache intensifies. After next few hours, there is profuse sweating and the temperature falls. The attack of malarial fever is repeated on alternate days or after two days.

Some of the more effective methods for control of malaria are:

- Stagnant water should be drained, or sprayed with kerosene oil once a week to stop the breeding of mosquitoes.
- Edges of water courses and ponds should be cleared of weeds.
- In areas where stagnant water cannot be drained due to water logging eucalyptus trees should be grown. This is also applicable to areas that remain damp and wet due to water logging or any other reason.
- In areas or in seasons where there is large breeding of mosquitoes, dark and damp places in the houses and streets should be kept as dry and clean as

possible. This is a good alternative to the use of insecticides that can be harmful to human beings themselves.



- Use of preventive medicine during malarial season should be resorted to, especially in the case of children.
- While sleeping cover the body, especially of children, with mosquito netting or thin cloth.

Diseases originating from rats:

The disease that occurs primarily in rats is plague. The germ of this disease is spread through a particular species of fleas that usually live on rats. The infection of plague from rat to man, and man to man, takes place through the bite of fleas.

The onset of disease is indicated by sudden high temperature, weakness and depression. Later inflamed lymph nodes appear in the area of groin. Vesicles are formed at the point where the flea bites. If the germs pass into the lungs, they can cause pneumonic plague which is indicated by blood stained sputum.

The measures to control plague are as follows:

- The patient should be isolated till recovery.
- The persons in contact with the patient should wear gloves and masks.

- The room of the patient, and his clothing and linen should be disinfected with lime.
- A general disinfection spray should be undertaken in the village or locality as a whole.
- In case of an epidemic, immunization through vaccination is advisable.

How to distinguish between diseases having similar symptoms.

In this chapter some basic information has been provided in respect of 23 more common infectious diseases. Since a number of diseases have similar symptoms, there can be some confusion about the nature or identity of disease. This by itself can be a problem, or a cause of serious problem. One can get some idea of the nature of problem from the fact that out of 23 diseases dealt with in this chapter 11 diseases begin with fever and 5 with loose motions. Hence, here is need for some guidelines to enable people, who are not physicians, to distinguish between various diseases.

In this section visible and easily understandable symptoms have been used for easy identification of the diseases. In case even the main symptoms are common, effort has been made to further distinguish those diseases on the basis of some additional symptoms. It may be clarified that the symptoms are only indicative, and conclusive finding will have to be obtained by test and proper medical advice.

Symptoms	Likely disease
Fever with the swelling of salivary gland	Mumps
Fever with pain in the neck followed by coma	Meningitis
Fever in the evening, dry cough and loss of weight	Tuberculosis
Fever with rashes (a) if fever accompanies shivering (b) if fever accompanies coryza but no shivering	Chickenpox. Measles
Fever followed by yellow colouration of skin, conjunctivitis and urine	Hepatitis B or C.
Fever with coryza and pain in the limbs	Influenza
High fever with sudden chills	Pneumonia
Continuous fever for days, headache, sore throat	Typhoid
Fever with coryza, chill, pain in abdomen and paralysis	Polio
Fever, difficulty in swallowing, inflammation in the throat tonsils or trachea	Diphtheria
Loose motions with blood and mucus, and fever	Bacillary Dysentery
Loose motions with blood and mucus, but no fever	Amoebic Dysentery
Loose motions without blood or mucus	
a) if rice water like stools are preceded by headache and nausea	Cholera
b) if loose motions are not preceded by headache or nausea,	Diarrhoea
c) if loose motions are accompanied by chill, nausea and vomiting	Food Poisoning.

Chapter

Non-Infectious Diseases And Ailments

Non-Infectious Diseases And Ailments

Non-infectious diseases can be classified into six major groups:

- Diseases caused by impairment of bodily functions due to age, such as rheumatism or cataract.
- Diseases caused by the malfunction of some organ or system such as diabetes, cancer, hypertension or stroke.
- Diseases caused by lack of some nutrient, such as anaemia, night blindness, rickets.
- Diseases caused by poison entering into the body, such as those caused by drugs, smoking, alcohol, and the residual insecticides or pesticides contained in fruits and vegetables.
- Diseases that people are born with or are prone to, such as glaucoma, deafness, skin disease, or certain kinds of epilepsy.
- Diseases that are psychological, such as hysteria, paranoia, sleeplessness, fear or anxiety.

Among these diseases some are very common, and their patients can be counted in hundreds of thousands. The more common diseases are: anaemia, blindness, cancer, cataract, diabetes, and hypertension. Basic facts about these diseases, that can help reduce the severity or, where possible, prevent them, are summarized in the rest of this chapter.

1.Anaemia It is a common problem in women during pregnancy and lactation, and children. It is estimated that 55% of the rural and 71% of the urban population is anaemic. It is mostly due to the deficiency of iron caused by inadequate intake of dietary iron, severe diarrhoea, or intestinal diseases. Parasitism, especially hookworm infection, can also cause anaemia due to continuous loss of blood. Anaemia also increases the risk of maternal and foetal mortality as abortions, premature birth, post-delivery hemorrhage and low birth weight are caused by low hemoglobin level, which is a direct consequence of iron deficiency.

Symptoms of iron deficiency depend on the degree of severity. Skin, mucous membrane and conjunctiva assume unhealthy pale appearance. In children there may be edema (collection of watery fluid in cavities or tissues) and enlarged liver and spleen.

Prevention is possible through measures such as these:

- Pregnant and lactating women should be given food rich in iron, e.g. eggs, dates, meat, fenugreek (*methi*) and other green vegetable.

- Children should be protected from all intestinal diseases, and should be treated quickly whenever any such disease is indicated.

- Children should also be given iron rich diet. One egg a day would not only prevent iron deficiency but would also be beneficial for many reasons explained in the First Book.

2.Blindness Main causes of blindness are cataract, trachoma, glaucoma, and vitamin A deficiency. Trachoma, being an infections disease has already been dealt with in the previous chapter, and cataract will be dealt with separately.In this section is provided some information about glaucoma and vitamin A deficiency:

- Glaucoma is one of the major causes of blindness in children. It is indicated by a gradual build-up of pressure inside the eyeball that is caused by obstruction to the flow of a fluid which circulates slowly, carrying nutrition to various parts of the eye. It finally leaves through various channels, and passes into the blood stream. In some children the outflow of this fluid is obstructed due to some congenital defect. When the pressure inside the eyes rises, the eyeballs expand, the blood supply to the eyes begins to be reduced, and finally the eyes stop functioning.
  The disease is indicated when a child is born with large eyes, that are watering constantly, and do not open in the light. Sometime these symptoms are not very marked and, instead, the child may show other symptoms of defective vision, such as inability to follow accurately the direction of the sound, and rapid to and from movement of the eyeball. The child, because of defective vision, can also be less active. Glaucoma can be cured if treatment is begun at early stages of the disease. The child must, therefore, be taken to an eye specialist as soon as any of the symptoms are noticed.

- Vitamin A deficiency is caused in the children due to depletion of nutrients because of repeated attacks of the infection of the respiratory tract or of the digestive tract, or both. It is also caused by unbalanced diet that is poor in vitamin A. When deficiency of the vitamin becomes severe, the child becomes inactive after dark because of night blindness. The child also develops a yellowish white foamy spot over the white area of the eyeball. If this is allowed to last for weeks and months, the eyes start watering, and the cornea (the transparent layer forming the front of the eye) gradually melts away, and blindness follows. Prevention is possible if pregnant and lactating mothers, and children, are given food rich in vitamin A e.g. green vegetables, yellow fruits (mango, papaya), eggs, and milk.

3.Cancer It is not a single disease, but a group of diseases that are characterized by an abnormal growth of cells which have the ability to invade other tissues and organs, and multiply at a fast rate. When cancer cells multiply and reach a noticeable size, cancer becomes clinically evident as a lump or ulcer in the organ of origin. This is called 'primary tumour'. Later, cancer spreads to the adjacent lymph nodes and other organs. This is called 'secondary tumour'.
The causes of the change in the cells that leads to their uncontrollable growth are not known. However, there are certain factors that predispose a person to cancer. These are:

- Older persons with weaker immune system are more likely victims of cancer, but some cancers, like leukemia, can attack the young also.
- Smoking can cause cancer of the lung, and chewing betel leaves can cause cancer of the mouth.
- Eating too spicy food over a long period can cause cancer of the esophagus (passage from the mouth to the stomach).
- Excessive intake of alcohol can cause cancer of the liver.
- Excessive intake of beef can cause cancer of the bowel, and of fat-rich diet of breast cancer.
- Farmers engaged in spraying of insecticides and pesticides without taking required precautions make themselves liable to cancer of many kinds.

Some of the early symptoms of cancerous growth are as follows:

- A lump or hard area in the breast.
- A new or a growing mole.
- Excessive menstrual bleeding.
- A persistent change in the digestive or bowel habits.
- A persistent cough or hoarseness.
- A swelling or sore that does not heal.
- An unexplained loss of weight.

There is no known effective method of prevention of cancer, or of its cure once it has reached an advanced stage before detection. All that can be recommended is that the possible causes of cancer, enumerated above should, where possible, be avoided.

4.Cataract It is the most common cause of blindness all over the world. Blindness is caused by the gradual clouding of the transparent lens inside the eyeball. It is a disease of the old age, but can occur at any age. In the case of children cataract can be caused by hereditary factors or if the mother of the child suffered from rubella (German measles) during the early part of pregnancy.
Prevention of cataract due to old age is not yet possible, but saving the eyes from undue strain and its proper nourishment could at least postpone the onset of cataract. The following measures should be taken for better care of the eyes:

- Do not read books in dim light or while lying down or under too bright light or while in a moving vehicle.
- Do not watch TV while too close to the TV set, or in the dark, or while lying down, or for too long.
- Do not touch the eyes with soiled hands, or wipe them with unclean cloth.
- Have the eyes examined by an eye specialist whenever there are any signs of disease or feeling of discomfort in the eyes.
- All girls above the age of 12 years should be vaccinated against German measles so that their children are not born with a predisposition to cataract.

5.Diabetes Diabetes is caused by the deficiency of insulin (a hormone) which is produced in the body by pancreas. Since insulin controls the metabolism of sugar, its deficiency results in increased amount of sugar in the blood, and of unused glucose in the urine.

The disease is indicated by:

- Excessive urination due to continuous activity by the kidneys to release unused sugar.
- Excessive thirst due to withdrawal of water from the tissues as a result of excessive urination.
- Excessive hunger due to depletion of energy.
- Weakness and fatigue.
- Slow healing of wounds and cuts, and diminished vision.

Diabetes can also lead to many complications, such as abortion or birth of dead babies, abnormalities in the offsprings, premature hardening of the arteries leading to cardio-vascular diseases, and cataract.
Diabetes can occur when a person is young (juvenile diabetes) or older (adult diabetes). Juvenile diabetes often begins before the age of 20, and is a hereditary disorder. It can be controlled only by insulin injections. Adult diabetes usually begins after the age of 40 and is more common among people who eat a lot and are fat.

Following preventive and control measures are recommended:

- Since juvenile diabetes is hereditary, chances of the offspring of a diabetic inheriting the disease are high. In case both the parents are patients of diabetes, the chances of their offsprings inheriting the disease are almost inevitable. The only way to prevent such a situation is to avoid marriage of one diabetic with another.
- Persons who are overweight should reduce their weight till it becomes normal.
- Diabetics must not eat any sugar, sweets, or any other food that sweet.
- Diabetics must go for brisk walk daily and keep their feet clean.

6.Hypertension It is a condition of raised blood pressure that is more than 140/90. It is indicated by headache, fatigue, insomnia, breathlessness on exertion, and occasional pain in the left shoulder. It is associated with all the heart diseases, and is one of the common diseases all over the world. It is estimated that in Pakistan about 150 persons in every 1000 may have high blood pressure. Major causes of hypertension are as follows:

- Hereditary and familial tendency.
- Excess body weight.
- Excessive intake of food, especially of fats.
- Excessive intake of salt.
- Smoking.
- Mental tension.

Prevention and control is possible through following measures:

- Persons who are overweight should reduce their weight.
- Food with lot of sugar, starch or fat should be avoided.
- Salt intake should be reduced to the minimum.

- Walking or light exercise for about 30 minutes should be made part of the daily routi ne.
- Giving up smoking is a major preventive step.
- Drinking 6-8 glasses of water a day is the cheapest and the easiest way to reduce hypertension.

Chapter

Occupational Diseases

Occupational Diseases

Occupational health is a vast subject that includes, according to the definition given by the joint ILO/WHO Committee on Occupational Health, three basic elements: promotion of physical, mental and social well being of workers; prevention of diseases caused by working conditions; and protection of workers from risks resulting from factors adverse to health. Previously occupational health was considered to be a matter of concern only in respect of workers employed in factories and mines, but now it applies to all sectors of economic activity including agriculture.

Since this handbook is about prevention of disease, and is mainly addressed to the rural and semi-urban population, the information contained in this chapter is about the prevention of diseases associated with the rural environment and occupations. Further, it needs to be clarified that by "occupational diseases"is meant the diseases that workers in different occupations are particularly exposed to, but intention is not to suggest that workers alone can fall prey to these diseases. Next, it also needs to be clarified that there is nothing in the occupations themselves that causes disease. What causes disease is the condition, environment, and the manner in which the functions of an occupation are performed. Hence, all occupational diseases are preventable.

There are four main agents of occupational diseases, namely: infection (germs); dust (organic); dust (inorganic); chemicals, and heat and cold. The rest of this chapter is devoted to providing basic information about various diseases under each of these four groups, their causes, and ways of prevention.

I. Infection There are three more common infectious diseases to which farmers, shepherds, dairy farmers, poultry farmers, hide and wool handlers and butchers are more vulnerable than the rest of the population. Basic facts about these diseases are as follows:

- **Anthrax** It is a disease of cattle and other herbivores like sheep and goat, and its germs are found in the tissues, hair, wool and hide of the animals suffering from this disease. They are also found in the soil and pastures where the infected animals graze. The disease is transmitted to those who handle the animals or their hide and wool.

  The disease is indicated by malignant pustules and gastrointestinal disorder. The only way to prevent this disease is to get the domestic animals vaccinated. There is no vaccine for humans.

- **Dermatophytosis** This is a fungal infection that affects the skin of cattle, sheep, horses, dogs, goats and deer. When transmitted to man it causes non-painful pustules on hands and arms that later leave shallow red ulcers. It usually affects hide and wool handlers. The only possible prevention from infection is to wear gloves when handling hides and skins, and to disinfect the gloves after use.

- **New Castle Disease** It is an influenza-like viral disease of the birds, indicated by respiratory and gastrointestinal disorder. It is transmitted to man through contact with the infected birds. The only way to prevent infection of this disease is to protect the birds from this disease.

2.Dust (organic) There are three diseases that are caused by organic (vegetable) dust. These are: Bagassosis (cane dust), Byssinoris (cotton dust), Farmer's lung (hay or grain dust).

A brief account of these diseases is as follows:

- **Bagassosis.** This is a disease caused by inhalation of bagasse, that is, sugar cane dust. It is indicated by breathlessness, cough, blood in the cough, and slight fever. There are a number of preventive measures that can be taken, such as:
  a) control of dust through exhaust and ventilation,
  b) covering the mouth and nose with cloth, and
  c) keeping the moisture content above 20 per cent,

- **Byssinosis.** This is caused by inhalation of cotton fibre dust over a long period. It is indicated by chronic cough, difficulty in breathing, leading to chronic bronchitis. Use of masks, and exhaust ventilation are good preventive measures for workers in textile mills and cotton ginning factories.

- **Farmer's lung** This disease is caused by inhalation of mouldy hay (fungoid growth due to dampness), and grain dust. Whenever the moisture content in grain dust or hay rises beyond 30 per cent, bacteria and fungi grow rapidly. The disease is indicated by respiratory disorder that can damage lungs. The

only possible prevention is to cover the mouth and nose with cloth where the air is thick with grain dust.

3.Dust (inorganic) There are many diseases caused by inorganic dust, the most common being silicosis caused by inhalation of dust containing silicon or silicon dioxide. More likely victims of this disease are the workers engaged in sand blasting, building and construction work, rock mining, coal mining etc.
The onset of the disease is indicated by cough, difficulty in breathing, and pain in the chest, and can lead to tuberculosis or, to give it the correct name, silicotuberculosis.
The biggest cause of concern is that there is no treatment for silicosis. Changes caused by this disease cannot be reversed. The only way to deal with the disease is to prevent it by:

a) Grinding the floor in water, during construction of building.
b) Hydroblasting or wet blasting, during sandblasting and stone mining.
c) Use of masks or respirators, and
d) Regular medical examination of the workers.

4.Chemicals There are numerous chemicals, used in industries, farms and homes, that cause all sorts of diseases from skin irritation to cancer. For rural population the most common source of such diseases are insecticides and pesticides. These chemicals enter the human body through oral digestion by the mouth; breathing through the nose; and absorption through the skin. It is estimated that in Pakistan about 50,000 persons are seriously affected by these chemicals every year.
Best way to prevent the diseases caused by these chemicals is to follow the instructions for use given by the manufacturers and take the following general precautions:

A) All operations for the application of toxic chemicals should be performed while wearing shoes, gloves and protective clothing.

B) While spraying insecticides or pesticides one should never allow the wind to blow into one's face. In order to ensure that one should move ackwards (and against the wind) while spraying. This will ensure that the

wind, laden with the chemicals, will not blow into one's face, and the person spraying will not keep moving into the area already sprayed by him.

C) After the application of toxic chemicals the operator must wash the exposed parts of the body.

5.Heat and Cold A number of disorders are caused by climatic changes in temperature because of which people working outdoors, especially farmers, are exposed to very high and low temperatures. Exposure to extreme temperatures can cause serious disorders, such as heat exhaustion and heat stroke in hot weather, and chilblains, immersion foot and frostbite in cold weather. Since the farmers are familiar with this situation there are many traditional ways of protection from adverse weather, but quite often even simple protective measures are not taken. Some of the basic and simple protective measures that should never be neglected are:

- Heat and cold usually affect the two exposed extremities, that is, the head and the feet. Both in hot and cold weather head should always be covered, and shoes should always be worn. Going about barefoot can be a cause of many diseases also, as pointed out in the previous sections of this handbook.

- In hot weather, the farmers should start work as early as possible and, if the weather is too hot, suspend work as soon as dehydration starts. Dehydration is indicated by dry mouth and scanty urine. Dehydration can also be prevented by frequently drinking water with salt (half teaspoon of salt in a glass of water) while at work in the field. Deviation from these safety measures can even be fatal.

- In cold weather, the farmers engaged in watering the fields can suffer from immersion foot (a disease caused by the immersion of feet in cold water) and common cold as well. Prevention of this ailment is possible if long rubber boots are worn by persons who have to work in water, especially during night-time, in cold water. If rubber boots are not available or are not affordable, then, a cheaper improvisation would be to wear woolen socks and cover them with a long plastic bag to save the socks and the feet from getting wet.

- Cold weather can cause frostbite, and chilblains which affects hands, feet, ears, and face in children; the legs and toes in women; and the hands and fingers in men. The only preventive method is to keep the likely areas to be affected covered to protect them from cold wind. It is to be noted that children are likely to be affected more extensively then adults.

Chapter

Basic Principles of Prevention of Disease

Basic Principles of Prevention of Disease

There are numerous ways and causes that make us sick, but only five basic principles that can help us stay healthy under normal circumstances. Staying healthy is, therefore, within the means of every human being, without much cost or effort.

The five basic principles are these:

First The first and the foremost principle for good health and prevention of disease is cleanliness. Most of the common diseases, especially the infectious diseases, are caused by unclean food. Cleanliness, in all its aspects, has been discussed in detail in the First Handbook of this series.

Second Adequate nutrition, even if it is less then optimum, can prevent many diseases that are caused by the deficiency of proteins, carbohydrates, fats, vitamins or minerals. As explained in the first Handbook, even a combination of four basic foods (Wheat/rice, milk, eggs, and pulses) would provide almost all the nutritional requirement. Any addition of meat, fish, vegetables and fruits would of course, by more beneficial.

Third It may sound incredible, but merely drinking sufficient quantity of water (4 to 8 glasses, depending upon the weather and occupation) each day is essential for good health. If the human body, which is more than two-third water, is deprived of adequate quantity of water, many adverse effects can be expected. It would, for example, cause dry skin, constipation, excess fat in the bloodstream, and kidney stones.

Fourth Simple food is much better than rich food. In other words lightly cooked food with little oil, and no refined rice or flour, and little sugar and salt, is far better than being overfed. It is possible that over feeding may provide more power and energy in the short term, but it would, inevitably, lead to clogging of the body systems overweight, high blood pressure and heart problems, to mention only a few problems that overfeeding is likely to cause.

Fifth Add rich (also cheap) sources of nutrition in the daily intake of food. Fenugreek (*methi*) and similar other leafy vegetables e.g. amaranth (*chaulai ka saag*), are good sources of iron, calcium and other minerals; gur is better than refined sugar; green tea (especially of home-grown lemon grass) instead of the expensive varieties of blended tea; fresh cold-pressed vegetable oil instead of refined oil; and flax seed oil (one table spoon daily) for efficient digestive system. These are only some examples out of whole range of herbal sources of nutrition that promote health and prevent disease. Exploring other possibilities provided by folk wisdom can be an interesting and healthy pastime. It would, thus, be seen that maintaining good health, and preventing disease, is neither difficult nor expensive. Good health, and prevention of most of the diseases, under normal circumstances, is within the reach of all.

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