MS.DHANALAKSHMI
LECTURER
ICON

Q.1 What do you understand by water pollution? Write a brief note.

Ans.

Water is very crucial natural resource. All the living things depend on water for their survival. Around 71% of the earth's surface is covered with water. From this 71% around 97% water is in the oceans and is not suitable for drinking, as ocean water is salty. Only the remaining 3% of water is available as lakes, ponds, rivers and fresh water resources such as ice sheets, wells, springs. Only 1%-1.6% is available for drinking Water pollution is the contamination of water bodies (e.g. lakes, rivers, oceans, aquifers and groundwater). This form of environmental degradation occurs when pollutants are directly or indirectly discharged into water bodies without adequate treatment to new harmful compounds. It contains impurities of different kids, A. natural or man-made impurities The natural impurities may not be dangerous. These include dissolved gases much as nitrogen. carbon dioxide and hydrogen sulphide which may have been picked up via rainfall. Then minerals get dissolved in the water which may he taken while water comes in contact with the soil. It may also contain suspended impurities such as clay, salt and mud and microscopic impurities (microorganisms which may be derived from the atmosphere.

Pollution caused by human activity mainly urbanization and industrialization is a more serious aspect of water pollution. The types of water pollution generated by Human activities are as follows:

(a) Sewage: It contains decomposable organic matter and pathogenic agents

(b) Industrial and trade wastes. They contain toxic agents such as metal salts and complex synthetic organic chemicals.

(c) Agricultural pollutants: They comprises toxic fertiliser and pesticides which are used for maximizing the agricultural production. These chemicals are often washed out by rain or running water and end up in water bodies causing this kind of chemical pollution.

(d) Physical pollutants These are caused by, for example, thermal power plants when a large amount of coal ash is dumped into water bodies

(e) Radioactive substances: These are caused when nuclear radioactive substance is exposed to the surrounding air. Example are nuclear waste generated from hospitals, nuclear power plants or nuclear weapons production house.

(f) Increased population and growth of cities: Due to in crease in population, all the sources of water pollution ate increasing. The wisto-producing capacity of cities has increased due to higher consumption of all the re sources and is also causing reduction in the availability of pure drinkable water.

Water-Borne Diseases

Supply of pure uncontaminated safe drinking water is essential to achieve optimum health. Water-borne diseases are caused by pathogenic microorganisms that most commonly ute transmitted in contaminated fresh water. Infection com monly results during bathing washing: drinking in the preparation of food, or the consumption of food that is infected. Contaminated water can reach in our bodies in different ways such as

- Contaminated drinking water
- Edible substances
- Use of contaminated water for personal hygiene, swimming pools etc

The sources the contamination could be both natural such as wells and rivers and not natural such as artificial water reservoirs and the public supply system

Diseases and their health risks caused contaminated water are as follows:

Water-borne infectious diseases

Infective agents present in the water and case many diseases

- Virus causes Viral Hepatitis or polo
- Bacteria cause cholera, typhoid, diarrhoea, dysentery, etc.,
- Parasites causes roundworm, threadworm, guinea worm, etc.,

Diseases due to chemical change in water

Mixing of various kind of man-made chemical wastes into the water cases the water to undergo come chemical composition changes which make water harmful for consumption or for thing for personal hygiene.

Mixing of sewage, industrial wastes. chemical fertilizerens, insecticides are some of the examples.

These are also termed as water-borne chemical hazards They include the following:

a) Diseases caused by toxicity of water:

When the limits of nitrates and fluorides exceed in water it uses fluorosis while excess lead, arsenic mercury or other the substances are causes of many handful water disease.

b) Mixing of sewage with the water

Mixing of sewage waste with water many cause disease in intestine or digestive system. It may also cause disease which may be communicable in nature and may result in the full community getting affected.

Also deficiency of fluorides may also cause dental problems. The polluted water also disturbs and disrupts the aquatic life and if this water is used for irrigation it may travel to or bodies and cause various disease.

Prevention of water-borne diseases

Below are some methods for the prevention of water-borne diseases

- Following a good hygiene behaviour by all members of the family
- Washing and before and after meals or also be toilet and after using the washrooms
- Keeping finger nails short and clean at all times
- Drinking of safe and purified water at all times. Also it should be ensured that the water is stored at a hygienic place with storage containers being filly washed on regular basis.
- Food should be freshly consumed and the water the to cooked the food should be purified and preferably should he boiled first kill all the remaining bacteria from the water.
- Sanitation facilities must be properly managed with regular cleanliness and keeping the place dry. Also public Water apply system should not clash with cheese facilities
- Public places such as swimming pools and ponds should be regularly cleaned as they as exposed to people who already in ny have a disease which gets the water infected. Pool water should be chlorinated and at least 15% of the water should be changed every day

Purification of Water

Water purification is the process of removing undesirable chemicals, biological contaminants, suspended solids and gases from water. The goal is to produce water fit for aspecific purpose. It can be subdivided into two categories

1. Purification of water on large scale
2. Purification of water on small scale

1. Purification of water on large scale

The purification of water is necessary due to the harmful impurities present in it so as to make it safe and wholesome. The method for water purification depends upon the nature of raw water and the standards of its quality. For example. ground water may need to treatment just disinfection but surface water may contain pollutants and may need extensive treatment. Below are listed and explained the components of a water purification of water.

(a) Storage

(b) Filtration

(c) Disinfection

(a) Storage

Water is taken from different sources and is stored is natural (eg pour artificial (e.g. dams) reservoir provides a reserve of water which then is excluded from the external sources of pollution which could affect it. It also helps in the times of droughts when water is scarce and this stored water is used for all the purposes, Now, as a result of storage a very considerable amount of purification take place known as natural purification and which could be subdivided into three categories

- Physical: Almost of the impurities get cleared from the stored water

The particles impurities which are suspended in the water settle down in the storage reservoir due to the effect of gravity on them. As a result water also get clearer and reduces the use of filters

- Chemical: During the storage, the water also under goes certain chemical changes. The aerobic bacteria oxidize the organic matter present in the water with the aid of dissolved oxygen. This leads in the reduction in the amount of ammonia present in it and rise in the nitrates occur.
- Biological: A drastic drop occurs in the quantity of bacteria present in the water due to long storage periods. The pathogenic organisms gradually die out. This is one of the greatest benefits of storage. The optimum storage period of water is 14-15 days. If water is stored for longer periods it could cause the growth in water which could cause bad smell to it

(b) Filtration

It is the second stage of purification of water and is one of the main steps in the purification process as it removes nearly 979-199 of the bacteria present in water. From the other impurities two types of filters are in use, the ‘biological or slow’ filters and the rapid and or mechanical filters. Both of them are briefly explained below.

Slow sand or biological filters

During the nineteenth century, they were widely used for water filtration in large parts of the world. Even now also they are used in many parts of the world for primitive filtration and are the standard method of water purification

The various element of slow sand filters are as follow

1. Supernatant water The water above the sand bed whose depth various from 1.5 m, serves two important purpose. It provide a constant head of the water so as it permit the resistance of the sand bed and thus promoting a downward flow of water through the sand bed. It provide waiting period for the water which is around 3-12 hours.
2. A bed of graded sand: It is the most important part of the filter. The thickness of this sand bed could be around 1 m. The sand grains are specifically chosen with grain size (diameter) being 0.2-0.3 mm. The sand how used should be sterile and is supported by a layer of gravels which prevent the sand from entering the pipes.
3. An under drainage system: This system is located at the bottom of the bed and consists of porous pipes which serve as an outlet for filtered water and also supports the filter medium above.
4. A system of filter control valves: The purpose of these valves is to maintain a constant rate of filtration. The important component of this system is Venturi meter which measures the bed resistance and when the resistance bulks up it signals the operator to open the regulative valves to maintain the flow of circulation

Chlorination

This is a widely used step in water purification process and is useful for removing all the harmful bacteria which are present in the polluted water. Hydrochlorides and hypo chloride acid are obtained when chlorine is added to water and this chemical reaction kills off the bacteria.

Advantages of Chlorination

It kills off pathogenic bacteria

It makes water safe and clean for consumption and other

uses

It also controls algae and other impurities in water

2. Purification of water on small scale

On small scale, purification (mainly domestic) is done with the help of following methods:

Boiling: Heating the water up to its boiling point. It is a very successful method as it kills most of the bacteria, algae and other pollutants in the water. It is one of the most preferred methods used domestically

Filtration using domestic filters

Using chemicals: This includes using bleaching power (CaOCI) or potassium permanganate.

Disinfection of wells: This is done by using simple chlorination or double pot method.

Double pot method: It is one of the most famous methods of disinfection of water in wells. It is very widely used in many countries around the world. This method uses two cylindrical pots, one placed inside the other. The inside height and diameter are 30 and 25 cm, respectively, for the outer pot. A hole of I cm is made in each pot. In the innerpot, the hole is in the upper portion, near the rim and the outer pot is 4 cm above the bottom.

A mixture of 1 kg bleaching powder and 2 kg of coarse sand is prepared and slightly moistened with water. The in ner pot is filled with this mixture up into the outer one and the mouth of the latter is closed with polyethylene foil. The double pot is lowered into the well by means of a rope attached to the well kerb. The pot should be immersed at least 1 cm below the water level to prevent damage by the buckets used for drawing water. This is how a double pot works in wells. It could on an average draw off 360 450 L/day.

Nurses' contributions in prevention and control of water pollution

(i) Identification of the source of water pollution while being distributed domestically

(ii) Creating awareness about this serious issue around their locality, locally educating the community lead ers, the people who are influential and creating efforts to educate people about the health hazards it causes.

(iii) Educating people at large about:

Importance of clean and safe water Methods of purification of water domestically Storing the water safely

(iv) Notification and timely treatment of water-borne dis eases and educating people about the solution if they catch a water-borne disease.

***2.* (a) define immunization**

(b) ennumerate the Immunization of 0 to 2 years old children AS PER nATIONAL IMMUNIZATION SCHEDULE

(C) DISCUSS COLD CHAIN.

==========

(a) <u>IMMUNIZATION</u>:

Immunization is one of the most cost effective ways to protect and prevent humans from infectious diseases. Immunization is a process of including immunity artificially through the administration of antigenic agents.

Immunization is also defined as providing prophylaxis to an individual against specific diseases through administration of vaccines and toxoids.

Immunization is also defined as a mechanism of building immunity through artificial means.

Immunization is the most powerful and cost-effective weapon of modern medicine. By reducing the number of susceptible in the community, it includes 'herd immunity' making the infection more difficult to spread. Vaccination during the infancy and early childhood against infectious Diseases help to boost and maintain optimum immunity levels.

vaccination against some diseases have been included in the national immunization programme while vaccination against certain diseases are offered only to high risk groups or restricted to a particular geographical area where the disease is endemic.

- Vaccinations are not 100% effective in case where a person is exposed to large dose of pathogenic organisms.
- Every country has its own immunization schedule. the trend is to combine vaccines together, thereby reducing number of injections a person receives.

Objectives of immunization:

- to reduce infant mortality rate by immunizing against six killer diseases (polio, tetanus, Diphtheria,TB, measles, Pertussis).
- To reduce material mortality rate by immunizing women with tetanus toxoid in antenatal period.
- To control infections of diseases and their carriers.
- To improve quality of life and life expectancy of people by generating prophylaxis against disease.
- To develop adequate technique and capacity for manufacturing vaccines.

COMMON PREPARATIONS USED IN IMMUNIZATION:

1. **Vaccine:**

   A suspension of live attenuated or killed microorganism or antigenic portion introduced in the host to induce immunity of antitoxin.

2. **Toxoid:**

Modified bacterial toxin that has been made nontoxic in such a way that it retains the ability to stimulate formations of antitoxin.

3. **Antitoxin:**

It is an antibody derived from animal's serum after stimulation with specific antigens and used to provide passive immunity.

4. Immunoglobulin:

An antibody derived from human blood containing solution from plasma that is used for maintaining immunity in immunodeficient patients or for passive immunity.

(B) National immunization schedule:

Characteristics of immunization schedule:

1. Epidemiologically Relevant: Vaccinations should be according to health problems of the area and time.

2. Immunologically Effective: Children must be vaccinated at the night time, at the right time, at the right age which benefits them by forming defences and before they are exposed to possible infections. Immunization is not effective if given at very short interval between the doses.

3. **Feasible:** Vaccines should be cost-effective and have the ability to obtain a high percentage of coverage.

4. Schedule must be minimize the number of visits by collective administration of vaccines.

5.**Socially Acceptable**: It is as per the local customs beliefs, practices, season and climatic factors and daily work pattern of the Community.

National immunization schedule

BIRTH	BACILLUS CALMETTE GUERIN (BCG), ORAL POLIO VACCINE (OPV)-0 DOSE, HEPATITIS B BIRTH DOSE
6 WEEKS	OPV-1, PENTAVALENT-1, ROTAVIRUS VACCINE (RVV)-1, FRACTIONAL DOSE OF INACTIVATED POLIO VACCINE (FIPV)-1, PNEUMOCOCCAL CONJUGATE VACCINE (PCV) -1*
10 WEEKS	OPV-2, PENTAVALENT-2, RVV-2
14 WEEKS	OPV-3, PENTAVALENT-3, FIPV-2, RVV-3, PCV-2*
9-12 MONTHS	MEASLES & RUBELLA (MR)-1, JE-1** , PCV-BOOSTER*
16-24 MONTHS	MR-2, JE-2**, DIPHTHERIA, PERTUSSIS & TETANUS (DPT)-BOOSTER-1, OPV – BOOSTER
5-6 YEARS	DPT-BOOSTER-2
10 YEARS	TETANUS & ADULT DIPHTHERIA (TD)

16 YEARS	TD
PREGNANT MOTHER	TD-1, TD-2 OR TD-BOOSTER***

important points :

- DPT and Hepatits vaccine and 14 weeks are replaced by DPT –hep B- Hib vaccines under national immunization schedule in 2009-10.
- Malnutrition, low grade fever, mild respiratory infection, Diarrhea and other minor illness are not contraindications to vaccination.
- Contraindications to vaccination include high fever (>38°C) and severely ill patients.
- If immunization status of a child is not known, there is no harm in giving appropriate vaccines again.
- Active immunoprophylaxis after exposure to disease is recommended for Rabies, Varicella, Measles (within three days of exposure), Hepatits and tetanus.

(C) COLD CHAIN :

The cold chain is defined as a system of transportation and storage of vaccine in a potent state at a recommended temperature from the place of manufacture to the point of use of actual vaccination site.

- It include storage of vaccine at vaccination centre and maintenance of temperature of volume vial during vaccination session at every individual center.
- Each individual from manufacture of vaccines to health workers at grassroots level has a significant role in maintenance of cold chain.
- Failure to maintain cold chain will result in vaccine failure, evidenced by occurrence of vaccine preventable diseases in the population throught to be well immunized.
- Among the vaccines, Polio is the most sensitive to heat and should be stored at -20°C.
- Vaccines that must be stored in freezer are polio and measles. vaccines that must not

be freezed and stored in the cold part are typoid, DPT, Tetanus, DT, BCG and diluents.

- All Vaccines must be stored as per instruction provided by the manufacture or they may become denatured and totally ineffective.

Principals of Maintaining Cold Chain and Cold Chain Equipments:

- Vaccines are cold chain equipments should be kept in s cool room , away from direct sunlight or any heat source.

- It should be locked and key should only be accessible to one designated personnel.

- Equipments should be placed at least 10 cm away from walls.

- Equipments should be leveled preferably on wooden block.

- They should be properly connected to one voltage stabilizer per equipment.

- Equipments should be defrosted from time to time whenever there is frost of more than 0.5 cm in ILR and Deep freezer.

- The inside temperature increases when a thick layer of ice is formed inside the freezer, thereby decreasing the efficiency of refrigerator.

- The Temperature of the equipment must be recorded regularly.

- All the Information about the person to be contacted in case of problem or failure must be put outside the refrigerator on a paper.

- The Vaccines must be protected from contact with antiseptics.

- Vaccines can be Stored for 4-5 weeks if equipments temperature is Strictly kept Between 4°C and 8°C (Except for Polio).

- Open Multidose vial that are not used fully should be discarded within 1-3 hours.

- Opening of equipment should be kept to a minimum.

Cold Chain Equipments:

1.**Walk in coolers**: These are refrigerators of the size of the room that can be used to keep all types of vaccines. They are used at regional level with the temperature being +2°C to +8°C. They are meant to store vaccines for long hours even if Electricity failure occurs, Vaccines can be stored up to 3 months and serve four to five districts.

2.DEEP FREEZERS AND ICE LINES REFRIGERATORS(ILRs):

Ice Line Refrigerators are lined with ice packs and tubes filled with water that freezes and help in keeping the internal temperature at the desirable level in spite of power failure for long hours. They have cold air inside better than a front opening refrigerators as they have op opening. it has two parts- Top and Bottom. Bottom of the refrigerators is the coldest part and top position consist of the Basket that is used to store vaccines(other than OPV and Measles) over two rows of empty ice packs kept on platform of an ILR. Measles and OPV can be kept over ice packs without the basket on the floor of ILR. They are used to store vaccines at district level(for up to 3 months) and PHC level(for up to 1 month) with proper Temperature maintenance and reducing Twice a day.

3. **SMALL DEEP FREEZERS**: They are also top opening freezers used at PHC level, urban family planning centers and postpartum centers. they are used to prepare ice packs and not for storing vaccines (except for OPV at district level). A 140 L deep freezers (DF) can prepare about 20-25 icepacks in 24 hour with at least 8 hours of continuous power supply. The temperature of deep freezers is between -15°C and -25°C.

4. **VACCINE VANS**: They are used to transport vaccines from one point to the point of use or last cold storage point. They are insulated vans that transport vaccines in bulk. Vaccines should be transported only in cold boxes with adequate ice packs.

5. **COLD BOXES**: Cold boxes are used for transportation of the vaccine and are supplies to all peripheral centers. These are thermally insulted thick wall boxes for transportation as well as emergency storage of vaccines and ice packs. Fully frozen ice packs are placed at the bottom eight sides of the box before placing the vaccines in cartons or polybags. The vaccines (except Measles and OPV) should not be kept in direct contact with ice packs.

6. **VACCINE CENTER**: They are thermally insulated box smaller than cold boxes. they are used at PHC level for carrying small quantities of vaccines (16-20 vials) and diluents from PHCs to sub centers of outreach sessions. The vaccines can be kept for at least 12 hours if not open frequently and closed tightly when not in use. Four frozen ice packs are used to line the four sides of the vaccines carrier and the vaccines are not kept in direct contact with icepacks.

7. **DAY CARRIERS:** They are also thermally insulated box used to carry small quantities of vaccine (six to eight vials) to nearby sessions. Two frozen icepacks are kept inside the carrier, one above and other below. They include boxes of Thermocol and Thermo Flask. They are used for few hours.

8. **ICE PACKS:** They are flat plastic containers filled with water, with no salt added to them. The water is filled to the Level Marked on the side of the packs and frozen in Deep freezer and used in nonelectrical cold chain equipment such as Cold boxes, Day carriers and Vaccine carriers. They are also used to keep reconstituted measles and BCG vaccine on the hole during the immunization session.

Recommended Time and Temperature of Vaccine Storage:

VACCINE	***SHELF LIFE***	***TRANSPORTATION***	***AT STATE/DISTRICT***	***AT PHC LEVEL***	***AT SUBCENTER***

		TEMPERATURE	*LEVEL*		*LEVEL*
1.DPT/DT/TT	*1-1.5 YEAR AT 4-8℃*	*4-8℃*	*3 MONTHS AT 4-8℃*	*1MONTH AT 4-8℃*	*1 WEEK AT 4-8℃*
2.BCG	*8 MONTHS AT 4-8℃*	*4-8℃*	*3 MONTHS AT 4-8℃*	*1MONTH AT 4-8℃*	*1 WEEK AT 4-8℃*
3.OPV	*2 YEARS AT -20℃*	*-20℃ TO 8℃*	*3 MONTHS AT -20℃*	*1MONTH AT 4-8℃*	*1 WEEK AT 4-8℃*
4 MEASLES	*2 YEARS AT -20℃*	*-20℃ TO 8℃*	*3 MONTHS AT -20℃*	*1MONTH AT 4-8℃*	*1 WEEK AT 4-8℃*

3. Write a note on ventilation.

Ans.

Ventilation is defined as the exchange of air between out doors and indoors'. In other words, entry of fresh and pure air to replace the stagnant and vitiated air of room is called ventilation.

The modern concept of ventilation states:

- Exchange of impure air with pure air
. Movement velocity of air
. Temperature and humidity of air
. Pleasant and infection-free air and thermal environment Ventilation is the science of pursuing or maintaining the environmental condition to keep human body healthy and to provide comfort to man.

The aim of ventilation is to ensure air supply inside the work place or living room in such a way that it is free from harmful agents and is conducive to comfort, efficiency and health.

Types of Ventilation:

Natural ventilation

Mechanical ventilation

1.Natural ventilation:

Simplest and natural method of ventilation: It is used in small buildings, schools, offices and primary healthbuildings. This may be due to wind, diffusion and temperature difference.

Wind/Air Movement: The principal type of wind movement is perflation. which refers to movement of air across the room when doors and windows are open It will perflute with

higher velocity if there is cross ventilation, i.e, when two windows or doors are present opposite to each other. When there is an obstruction, it bypasses and exerts a suction action at its tail end - this called aspiration. Closed doors and windiws lead to no movement of air and increase in humidity. As a result, there no ventilation

Diffusion: Air passes through small openings or holes in a building by diffusion/dispersion. These holes do not contribute majorly in ventilation but can be important in crowded residential places

Temperature Difference: Air flows from high density to low density. Warm air rises up and goes through ventilators while cool air enters from below through the opening near their Hoor. The greater the tempera ture difference between outside and inside air, the greater the velocity of the incoming ait. In summers. the difference in the density and temperature of the air is affected; therefore fans are used to maintain the movement of air. The main limitation of natural ventilation is that it is no possible to regulate the velocity of the incoming air or to adjust its temperature or humidity.

2. Artificial Ventilation:

There are following types of ventilation:

. Exhaust ventilation

. Plenum ventilation

• Balanced ventilation

• Air conditioning

• Exhaust ventilation:

Exhaust fans: are used to expel impure air by creating vacuum in the room which gets filled by the fresh air coming through entrance way. They are commonly used in large halls, auditoriums and factories,

• Plenum ventilation:

Fresh air is blown into the room by huge ducts/ centrifugal fans so as to create a positive pressure. and displace the vitiated air. This system is used for ventilation in air conditioned buildings and factories. Air is delivered through ducts at desired points Balanced ventilation:

It is the combination of exhaust and plenum system of ventilation. Air is forced into the room from one end using plenum system, while it is expelled from other end using exhaust system. This system is used for large conference halls.

. Air conditioning:

It is defined as the simultaneous control of all, or at least the first three of those factors affecting both thephysical and chemical conditions of the atmosphere within any contined space or room. These factors include temperature, humidity, air movement, distribution, dust. bacteria, odours, toxic gases, most of which affect in greater and lesser degree the button health and comfort. The difference between air conditioned air and the outside air is usually main tained at 5-8°C.

Uses of Ventilation:

1. Maintains constant physical conditions such as temper ature, huntidiry and air movement
2. Proper ventilation removes smells and odours from the room.
3. Reduces bacterial contamination
4. Maintains constant chemical composition of air in the room, le levels of oxygen and carbon dioxide, which is otherwise linble to change due to respiration, combus. tion and other industrial processes

Effects of Poor Ventilation:

Lack of proper ventilation leads to serious ill effects on health of the people. Common problems faced are

• Fatigue, irritability
• Insomnia and headache • Restlessness and discomfort
• Loss working capacity Nausea, vomiting • Hot flashes and excessive sweating leading to fainting
• Giddiness, dizziness
• Loss of appetite
• Weakening of immune system
• Respiratory disorders

Standards of Ventilation:

• Cubic space: 300-3000 cubic feet space should be available per hour per person • Air change room air should be changed two to three times every hour and that of conference halls four to six times
• Approximately 500 cubic feet area per person is desir able in residential buildings
• 1200-1800 cubic feet of space in hospitals should be reserved for each patient
• Floor space area should be between 50 and 100 square feet per person. In case of patients with communicable diseases, the index should be 144 square feet per patient • Bed in the

hospitals should be at a minimum distance of 3 feet • Ceilings in residential area must be at height of 11-12 feet

- Every house must have adequate number of windows and doors for proper ventilation
- Air in the premises should be free from dust, smoke and unpleasant smell

4. Write a note on radioactive pollution andIts prevention.

Ans.

Definition:

Radioactive pollution can be declined as the release of radioactive substances or high-energy particles into the air. Water or earth as a result of human activity by accident or deliberately Radioactive substances are the substances which emit invisible ionizing radiations due to nuclear disintegration, for example, uranium, radium and plutonium. These radiations are very harmful to living creatures as well as environment as it could lead to very serious diseases in living things or even death

Types of Radiation:

The radioactive radiations include three types of radio active particles getting emitted from nucleus of the radioactive substances

i) **A-Particles:** These are positively charged substances. These are the most dangerous in nature (10 times more harmful than X-rays, B-particle or y-rays) when taken by ingestion or inhaled during air, but they have verylittle penetration powers to get into the body.

(ii) **B-Particles:** These particles are negatively charged. These have good penetration powersbut generally do not get deeper into the organs in the body so they can destroy external body such as eyes and skin

(iii) **y-Particles**: These particles are electromagnetic radiations. They have high penetrating powers and so are more dangerous than the other two, as they can penetrate deeper in the body. In addition to these radioactive particles. X-rays are man-made electromagnetic radiations which are very useful in the medical field. They also have high penetrating powers,

and so can be harmful if used very frequently. Now to measure these radiations, the standardized use is called roentgen. It is the unit of radioactivity of the radioactive substance.

Sources of Radioactive Pollution:

Radioactive pollution can occur due to the following reasons:

(A) Man-Made Sources:

• Nuclear weapons testing

• Extraction of radioactive substances

• Use of these substances in the field of medicine Or research

• Operation of nuclear reactors

• Leaking of nuclear wastes due to careless storageOf the waste

(B) Natural Sources:

Natural sources include cosmic radiations and radiations from the environment. Substances such as thorium and uranium are present in soil and rocks and radioactive gases such as radon and this are present in the air.

Effects of Radioactive Radiation:

Radioactive substances have been known for their use fullness in the fields of medicine, research communication, agriculture and space technologies but they do have harmful effects on human body

In early levels, exposure of these radioactive sub stances to the human body could lead to depigmentation of skin or even hair loss. In the longer run, exposure to these substances could lead to diseases such as blood cancer and cancers in various parts of body such as lungs and thyroid.

They also affect the body genetically, i.e, hey make changes to the genetics and therefore in the end also affect the future generations acute exposure to the radiations causes radiation sick ness, sore throat, hair loss, bleeding under the skin and alsoVomiting Hiroshima and

Nagasaki are one of the major examples of the effects of nuclear radiations exposure on humans . Prevention and Control of Radiation: Radiation exposure mainly occurs due to the man-madeSituations where there may be a leak or in some other way. So various prevention methods or ways of doing so become necessary for safety of human beings working around these conditions or those who are in the area of exposure.

The following measures are advocated and implemented:

(i) Safe disposal of all the nuclear waste which gets generated from various nuclear power plants, hospitals,Laboratories and industries. A few methods of doing so are, for example, releasing these gases high up in the atmosphere where these would get diluted and would not come near the surface, storing radioactivitywastes in containers so that their radioactivity is reduced.

(ii) Initiating efforts to stop nuclear explosions: nuclear weapons are today one of the biggest threats to the survival of human beings since they release immense radiation once exploded. Even and nuclear weapon would mean the destruction of the nearby surroundings and radiation leaks all around the region. So efforts must be made to disarm armed countries of the world and superpower should take this initiative so as to ensure our survival

(iii) Underground testing of nuclear explosions, since testing these bombs on the surface causes effects to human beings and make the regions unfit for living, underground testing has taken their place. Underground testing leads to accumulation of radiation under the earth's surface and could destroy the geography of that region in the future.

(iv) Use of radiation therapy within safe limits and using only when it is absolutely required. As these radiations take years to become nonlethal, so any exposure should be avoided.

(v) Avoiding unnecessary X-ray examinations especially on children and pregnant women.

(vi) Spreading awareness about the issue so that people get aware and use these steps in their daily life to live a safe and healthy life. WHO, International Atomic Energy Agency (IAEA) and International Commission on Radiological Protection are a few international organizations working in this regard.

(vii) Monitoring the levels of radiation waste or levels produced by the industries, hospitals or in laboratories and keeping them under strict check.

Contribution of Nurses in Prevention and Control of Radioactive Pollution:

(i) Helping families and community people identify common sources of radioactive radiation generation so that they can be regulated or totally discarded.
(ii) Creating awareness amongst people about the harmful effects of radioactive radiations on human health and how it could affect their genetics as well.
(iii) Lobbying for disarmament of nuclear weapons.

5. Write a note on food hygiene.

Ans:

Food hygiene is one of the conditions and measures neces care the safety of food from production to con motion. Food can become contaminated at any point during slaughtering or harvesting. processing, storage, dis bution. transportation and preparation. Lack of adequate (hygiene can lead to foodborne diseases and even lead the death of the consumer.

Below are certain listed steps which are required in it of food produced from production to consump bio to make sure food is not contaminated and is fit for consumption.

1.Ensuring that contaminated sewage water is not used the time of irrigation on the fields especially for the production of vegetables and fruits

2.The food once produced should be package very care fully and should be transported at the appropriate temperature according to different food products.

3. During storage and preservation proper steps should be taken to prevent the food from getting spoilt during their storage.

4. Some food products such as meat, chicken, milk, milk products, fish and vegetables get contaminated very quickly and are sources for major food infections. Hence, certain special steps are needed to be taken to making sure they are not contaminated.

Following are a few examples of certain steps that are needed to be taken for it:

Milk and meat of animals suffering from any disease bould not be consumed as some infectious diseases or sonie traces of the could be transferred to humans

Pasteurization: A common technique of boiling milk and cooling it immediately. This helps in killing off major germs in it. It should be used in industries as well as domestically.

Fruits and vegetables today come with a risk of fertilers and insecticides being spread all over them. So, they should always be washed and cleaned before consumption. Also consume them it they are fresh.

Meat and fish should be consumed only when it is fresh Also, special attention should be given to the slaughter houses as they could, due to lack of diseases. cleanliness, cause a lot of disease.

It becomes very necessary for the kitchens to be clean and dry all the time so as to protect from diseases. They should be clean and should have proper drainage and ventilation.

Personal hygiene is one of the most important uspects of food hygiene as the cleaner you will be so will be the food

Food-borne Diseases

Food-borne illness is any illness resulting from the food spoilage of contaminated food, pathogenic bacteria, viruses, or parasites that contaminate food, as well as to ins such as poisonous mushrooms and various species of beans that have not been boiled for at least 10 minutes Symptoms often include vomiting, fever and aches, and may include diarrhea. Also, even if the food has left the body, the person would still feel its effects as microbes would still be inside the body. They could stay in the stomach, bloodstream or intestine or some other part of the body

Some common examples of food diseases and the pathogens which could enter our body are

(A) Bacterial pathogens:

(a) Salmonella

(b) Listeria

(c) Escherichia coli

(d) Vibrio cholerae

(B) Viral pathogens:

(a) Enterovirus

(b) Hepatitis A

(c) Norovirus

(d) Rotavirus

(C) Parasitic pathogens:

(a) Cryptosporidium

(b) Entamoeba histolytica

(c) Giardia

Food Toxicants

(1) Aflatoxins

There are a group of mycotoxins produced by certain storage fungi such as Aspergillus flavus and A. para- siticus. These are found in food grains such as ground nuts, wheat, rice and cotton seed.

(2) Ergot

Unlike Aspergillus, ergot is not caused due to storage fungi but by field fungus.Food grains such as bajra, rye and wheat have a ten dency to be affected by this ergot fungus (Claviceps fusiformis) at the time of flowering

(3) Epidemic dropsy

This toxin interferes with the station of the pyruvic acid which accumulates in the blood This is caused by a toxin called toxin alkaloid, satyuinarine

(4) Funarium trains

These are a species of held fungus. They contaminate food supplies and pose health head to humans as well as livestock Rice is an example of this toxin

Adulteration of foods

Adulteration is an addition of another substatice to a food item in order to increase the quantity of the food item in raw form or prepared form, which may result in the loss of actual quality of the food item

It consists of a large number of practices including mit ing selling rotten or decomposed food items and addition of toxoids for commercial gains As for a consumer, health is first of all paying more money than the food item deserves. Moreover, the food ilem could in the end be harmful for the person or people related to the person who consume the food.

Food Fortification

As per WHO, food fortification is defined as the process whereby nutrients are added to food in relatively small quantities to maintain or improve the quality of diet of a group, community or a population.

A few programmes initiated under this scheme include:

Fluoridation of water as to prevent dental problems.

iodizing salt to combat the problem of goitre .

Adding Vitamins A and D in milk and its products

As for the food to quality under this scheme of food fortification a few guidelines are created and set:

(1) The foods should be consumed by relevant sections of population from the total population and should be consumed constantly, which would lead to positive results

(2) The amount of nutrients added should meet the demand of the lowed nutrient demand consumer but should exceed the highest limits

(3) The addition should not cause the food to undergo a tAste or sell change of any kind

(4) The cost of the product should not be raised and should be available for the weaker section to the wealthy sec tion alike.

Prevention of Food Adulteration Act (PFA), 1954

It was enacted by the Government of India in 1954 with the objective of making sure that pare and wholesome nu nutritious food is provided to the consumers to protect them from fraudulent and deceptive trade practices

It was then done later in 1964, 1976 and 1986 with some improvements and addition of more measures to make the act more stringent and made adulteration a punishable of offence under

section 320 of IPC With the final amendment, voluntary organizations were allowed to take food samples to make sure the food is of good quality with no harmful adulterants

A special committee was also formed to independently take charge under this act amed Central Committee for Food Standards' constituted under the central government Most of the implementation is limited to the state govern ments but central government helps in coordinatin between the states

Also training programmes were setup by this commit. lee and officials were trained under this act to mule sure nothing slips away and everything is under consta surveillance

Certain other food standard organizations were also created by WHO as well as by the Indian government A few of them are listed below.

Food Standards:

(1) Codex Alimentarius

It is the principle part of the joint WHO/FAO fodd standards programme and also formulates food standards for international market. The food standards in India are based under Codex Alimentarius.

(2) PFA Standards

These ate the standards set by the Prevention of Food Protection Act (PEA) and are revised from time to time. Also, the purpose of this type is to make sure that a minimum quality of food is maintained.

(3) The AGMARK Standards

These standards are set by the Directorate of Market ing and Inspection of the Government of India. It gives the consumer the assurance that the product is of a certain quality determined by the type of standard.

(4) Bureau of Indian Standards

The ISt mark on any food item is a guarantee of good quality in accordance to the guidelines and standards provided by the Bureau of Indian Standards for that commodity

Note: The AGMARK and Bureau of Indian Standards are not mandatory. They are purely voluntary and express excellence above the PFA standards

6. Write a note on National Population Policy. Long-Term Objectives:

Ans.

National Population Policy

Population policy is intended to bring down the birth rate or the growth rate. India's first National Population Policy was formed in April 1976 that called for an increase in legal minimum age of marriage from 15 to 18 for females and 18 to 21 years for males. It was remodified in 1977 with emphases on small family norm without compulsion under the programme of Family Welfare Programme'. The Population policy set up by Parliament recommended a goal of achieving a net reproductive rate of 1.0 by 2000, which was not achieved.

*A new National Population Policy was approved by Ministry of Health and Family Welfare on 15 February 2000, with new demographic objectives.

*The NPP 2000 affirms Government's commitment to wards voluntary and informed consent of people when availing the reproductive health services.

*The NPP deals not only with fertility and mortality rates but also with maternal and child survival and health, women education, health care services to undeserved population (such as slums, hilly area population or migrant population), increased participation of men in family planning.

Objectives of NPP: 1. Immediate Objectives:

- To address the unmet needs of contraception, health care infrastructure and health personnel To provide integrated service delivery for basic reproductive and child health care

2. Medium Term Objectives:

*To bring the total fertility rates of replacement level through vigorous implementation of intersectoral operational strategies.

*To achieve a stable population by 2045, at a level consistent with the requirement of sustainable economic growth, social development and environmental protection.

National Socio-demographic Goals for 2010 under NPP, 2000:

- The policy states following socio demographic goals to be achieved by the year 2010 under NPP. 2000.

- Address the unmet needs for basic reproductive and child health services, supplies and infrastructure
- Make school education up to the age of 14 free and compulsory and reduce drop outs at primary and secondary school levels to below 20% for both boys and girls
- Reduce infant mortality rate to below 30 per 1000 live births

• Reduce maternal mortality rate to below 100 per

• Achieve universal immunization of children against 100.000 live births all vaccine preventable diseases Promote delayed marriage for girls, not earlier than

• age of 18 and preferably after 20 years of age

• Achieve 80% institutional deliveries and 100% deliveries by trained personnel Achieve universal access to information/counselling and services for fertility regulation and contraception with a wide basket of choice

*Achieve 100 percent registration of birth, deaths, marriage and pregnancy

*Control the spread of AIDS and promote greater integration between the management of reproductive tract infections (RTI) and sexually transmitted infections (STI) and the National AIDS control organization Prevent and control communicable diseases

Integrate Indian Systems of Medicine (ISM) in the provision of reproductive and child health services and in reaching out to households Promote vigorously the small family norm to achieve replacement levels of TFR:

*Bring about convergence in implementation of related social sector programmes so that family welfare becomes a people-centred programme

Strategies:

To achieve national goals for 2010, there are 12 strategies identified. They are as follows:

1. Decentralized planning and programme implementation
2. Convergence of service delivery at village levels
3. Empowering women for improved health and nutrition
4. Child survival and child health
5. Meeting the unmet needs for family welfare services
6. Under-served population groups such as urban slums, tribal communities, hill areas, adolescents with in creased participation of men in planned parenthood
7. Diverse health care providers
8. Collaboration with and commitments from nongovernment organizations and the private sector
9. Mainstreaming Indian systems of medicine and homeopathy
10. Contraceptive technology and research on reproductive and child health

11. Providing for the older population

12. Information, education and communication

Impact of NPP 2000:

Under NPP 2000. the population of India was expected to be 110 crores in 2010 rather than 116 crores.

- ✓To pursue fearlessly and effectively the agendas laid under the National Population Policy 2000, it is important to have a suitable and comprehensive legislation. For this purpose two acts have been formulated. They are ns follows:
  - i. The Prenatal Diagnostic Technique (Regulation and Prevention Act) 1994 - Under this act disclosure of sex of fetes is prohibited and those who violate this law are punished. This act is aimed at eliminating the social evil of female-focticide with active participation of voluntary and nongovernmental organizations and individuals to spread awareness about prenatal act. So far, 17 NGOS are selected to work under reproductive and child health programme towards activities for reducing gender discrimination and bringing about gender equality.
  - ii. Medical Termination of Pregnancy Act, 1971 – it was enected to improve the availability and accessibility of Scientifically approved services for termination of pregnancy in properly screened cases and hence reducingnimber of illegally induced abortions
  - iii. The NPP 2000 is mainly implemented and managed at Panchavat and Nagar Palika levels in coordination with the Concerried State or Union Territory Administration

7. Write in detail about food poisoning.

Ans.

Food poisoning is defined as acute gastroenteritis caused by ingestion food or water contaminated with either living bacteria or their toxins or inorganic chemical substances,

poisons derived from plants and animals and a variety ofnoxious organic substances that may be present in natural foods such as mushrooms, mussels, eels, scombroid fish and other sea food

The term food poisoning generally refers to those conditions with short incubation period which occur due to toxins produced by infective agents either in vitro or in vivo

Causes of Contamination:

1. Harmful organism: They can be classified as follows:

a. Bacteria: Such as staphylococci, salmonella, clostridiumwelchii, clostridium botulism contaminate the food.

b. Virus: They are present in throat and digestive tract of humans and animals. They come out through faeces and reach to food by some medium to contaminate it. For example, polio virus spreads by oral-faecal route and leads to polio in children.

c. Parasitic Infection: Found in gut of humans and animals and excreted through faeces, resulting in diseases such as amoebiasis, hookworm and roundworm infestation

d. Fungus: Fungus, such as Fusarium, Aspergillus fiavus and ergot, contaminate food and lead to leucopenia, anaemia, liver disease in people.

2. Chemicals: Chemicals such as DDT and BHC cause food poisoning. Accidental mixing of insecticides or rat poison also contaminates food. Excess of lead also causes food poisoning along with misuse of food additives, colours or acetone. Contamination also happens from storage such as use of cheap enamel dishes or galvanized pans.

3. Contamination by plants and animals: Some toxic plants such as atropine and solanine can cause toxicity in the body when consumed with spinach or salad. Some variety of mushroom and green part of potato can cause toxic effects. Fungus-infected groundnut and vegetables are also toxic.

4. Contamination during storage: Inappropriate temperature, insects and fungus can cause toxicity and decaying of food in stone houses leading to food poison ing and other diseases.

5. Contamination by adulteration: Adulteration of foodon large or small scales can cause toxicity and foodpoisoning

Causes of Food Poisoning;

Food poisoning may occur due to any source contamination from production point to consumption point.

The main causes are as follows:

• Improper handling of food

• Faulty food preparation

• Inadequate food storage

• Poor preservation of food Bad food hygiene or lack of sanitation

•Unsafe packaging or careless transportation

•Use of pesticides/chemicals/adulterants or medicines

Clinical Features:

•Abdominal pain

• Nausea and vomiting

• Diarrhoea or gastroenteritis With or without fever

• Headache and fatigue

People recover in a short period of time but it can be, fatal for people at high risk such as infants, young children, pregnant women, elderly and immunocompromised people

Types of Food Poisoning:

a. Bacterial Food Poisoning
b. Nonbacterial Food Poisoning

(a) Bacterial Food Poisoning.

NAME OF ORGANISM	*SYMPTOMS*	*INCUBATION PERIOD*	*SOURCE OF INFECTION*	*MODE AND MECHANISM OF TRANSMISSION*
SALMONELLA (MOST COMMON)	*CHILLS WITH FEVER, NAUSEA, VOMITING, PROFUSE DIARRHOEA (2-3 DAYS) ABDOMINAL PAIN*	*12-24 HOURS UP TO 5 DAYS*	*PATIENT AND CONVALESCENT CARRIER, RODENTS (CONTAMINATE FOOD BY URINE AND FAECES) INFECTED CATTLE AND LIVESTOCK SUCH AS CATS, DOGS, PIGS, DUCKS AND TURKEYS, THROUGH EGG AND EGG*	*MICROORGANISMS ON INGESTION MULTIPLY IN FOOD, MAINLY ANIMAL FOOD IN INTESTINE SUCH AS MILK AND MILK PRODUCTS, MEAT, FISH, EGGS; INFECTION IS TRANSMITTED THROUGH MILK AND MEAT OF INFECTED*

			PRODUCTS	*ANIMALS*
STAPHYLOCOCCUS AUREUS	*ABDOMINAL CRAMPS, NAUSEA, VOMITING, SALIVATION; IN SEVERE CASES BLOOD AND MUCUS MAY APPEAR; NOT FATAL WITHOUT FEAR*	*1-6 HOURS*	*USUALLY MAN; FOUND ON SKIN, NOSE AND THROAT OF MEN AND ANIMALS; COMMON AGENTS OF BOILS AND PYOGENIC INFECTIONS; COWS HAVING MASTITIS MAY INFECT MILK AND MILK PRODUCTS*	*S. AUREUS INFECT FOOD SUCH AS MILK AND MILK PRODUCTS DURING PREPARATION AND HANDLING ORGANISMS MULTIPLY AND PRODUCE TOXINS CALLED ENTERO-TOXIN WHICH IS HEAT STABLE AND NOT DESTROYED BY BOILING; MULTIPLICATION IS PREVENTED BY REFRIGERATION*
BOTULISM(CLOSTRIDIUM BOTULINUM)	*DYSPHAGIA, DIPLOPIA, PTOSIS, DYSARTHRIA, BLURRING OF VISION, MUSCLE WEAKNESS, CHANGE OF VOICE, CRANIAL NERVE PALSIES, OBSTINATE CONSTIPATION;*	*12-36 HOURS*	*ORGANISM IS FOUND IN SOIL, DUST AND INTESTIONAL TRACT OF ANIMALS AND ENTERS FOOD AS SPORES; MAINLY IN HOME PRESERVED FOODS SUCH AS HOME-CANNED*	*TOXIN IS PREFERRED IN FOOD UNDER ANAEROBIC CONDITIONS THAT ACTS ON PARASYMPATHETIC NERVOUS SYSTEM; EXOTOXIN IS HEAT LABILE, DESTROYED IN*

	DEATH DUE TO CARDIAC OR RESPIRATORY FAILURE IN 3-7 DAYS		*VEGETABLES, SMOKED OR PICKLED FISH, CHEESE,ETC.,*	*HALF AN HOUR AT 80C*
CLOSTRIDIUM PERFRINGENS	*ABDOMINAL CRAMPS, DIARRHOEA, WITHOUT NAUSEA AND VOMITING WITH LITTLE OR NO FEVER; NOT FATAL*	*8-12 HOURS*	*FOUND IN SOIL, WATER, AIR AND ANIMAL AND HUMAN FAECES; CASES ARE ASSOCIATED WITH INGESTION OF MEAT, MEAT PRODUCTS AND POULTRY*	*MICROORGANISMS MULTIPLY PRODUCE TOXIN IN THE CONTAMINATED FOOD; THE SPORES ARE ABLE TO SURVIVE COOKING AND IF COOKED MEAT/POULTRY ARE NOT COOLED, SPORES WILL GERMINATE ORGANISM AND MULTIPLY BETWEEN 30C AND 50C*
B. CEREUS	*EMETIC TYPE: UPPER GI SYMPTOMS SUCH AS VOMITING, NAUSEA, SALIVATION, ABDOMINAL PAIN DIARRHOEAL TYPE: LOWER ABDOMINAL*	*1-6 HOURS IN EMETIC TYPE 12-34HOURS IN DIARRHOEAL TYPE*	*CONTAMINATED FOOD COMMONLY FOUND IN SOIL; RAW, DRIED, PROCESSED FOOD*	*TRACED TO RAW, UNCOOKED OR PARTIALLY COOKED FOOD AND TINNED FOODS*

	PAIN, *DIARRHOEA*			

(b) Nonbacterial Food Poisoning:

(i) Mushroom Poisoning:

Symptoms: Abdominal pain. vomiting, diarrhoea, sweating. excessive constriction of pupil. diplopia, muscular incoordination, convulsion, coma

Causes: Eating fungi instead of edible mushroom oreating sprouting/green potatoes that contain excess of alkaloid solanine

Antidote: Atropine

(ii) Chemical Poisoning:

Prevention and control:

1. Keep Clean:

Proper inspection of slaughter houses, meat mar kets, hotels, dairies and food joints should be en forced as a general public measure

• Wash hands before handling food and duringfood preparation

•Wash hands after going to the toilet

•Wash and sanitize surfaces that are used for preparing food

• Protect kitchen area from insects, rodents, pests and other animals

•Kitchen should have enough space, light, ventilation and washing facilities; all garbage andwaste food should be kept covered

• Cooking staff should not be carriers of salmonella or staphylococcal infection

2. Separate Raw and Cooked Food:

• Keep raw meat, poultry and seafood separatelyfrom other foods
• Use separate equipment and utensils such asknives and cutting boards for raw foods
• Store food in containers to avoid contact be tween raw and prepared food as microbes in rawfoods may be transferred onto other food duringstorage or preparation

3. Cook Food Thoroughly:

• Cook food thoroughly especially meat, eggs,seafood and poultry
• Boil soups and stews to make sure they have reached 70°C. For meat and poultry, make sure the juices are clear and not pink
•Reheat cooked food thoroughly as properly
cooked food is safe for consumption
• Food should be served hot: food with unusual
smell should be discarded

4. Proper Temperature:

• Do not keep cooked food at room temperature
for more than 2 hours
• All the cooked food and perishable food should be refrigerated below 5°C
• Serve hot food (more than 60°C)
• Do not refrigerate food for too long period
•Do not thaw frozen food at room temperature as microbes multiply more quickly at room temperature.

5. Use Safe Water and Raw Materials:

• Use safe, clean water to wash or treat raw mate rials
• Choose processed food such as pasteurized milk for safety
• Wash fruits and vegetables especially if eaten raw
• Never use food beyond its expiry date

8. Define the term carriers.

- Either due to inadequate treatment or immune response in certain diseases, the disease agent does not get com pletely eliminated, leading to a carrier state.
- carrier is defined as 'an infected person or animal that A has a specific infectious agent in the absence of describ able clinical disease and serves as a potential source of infection in others'.
- Carriers are considered to be less infectious than cases but they are more dangerous than cases because they escape recognition. They continue to live normal life among the population and readily infect the susceptible individuals over a wider area and longer period of time, under favourable conditions, e.g.typhoid Mary.
- Generally organisms do not remain viable outside the living body for a long time and have to enter some source to serve as reservoir of infection (carrier).

Conditions that confirm the carrier state:

- Presence in the body of disease agent
- Absence of recognizable symptoms and signs of disease
- Shedding of the disease agent in the discharges or excretions and thus acting as a source of infection for othersCarriers may be classified as:
- Type

-- Incubatory
-- Convalescent
-- Healthy

- Duration

--Temporary
-- Chronic

- Portal of Exit

--Urinary
-- Intestinal
-- Respiratory
-- Others (A)

Types:

(a) Incubatory Carriers: Carriers that shed the in fectious agent during the incubation period ofdisease are known as incubatory carriers. They have the ability to infect others before the onset of illness, especially during the last few days of the incubation period, e.g. measles, mumps, polio, diphtheria and Hepatitis

(b) Convalescent Carriers: Carriers that shed the disease agent during the period of convalescence are known as convalescent carrier or convalescent creators. The recovery from the disease does not indicate the bacteriological recovery too. A conva lescent carrier is a serious threat to the immediate surrounding and household members. In the case of typhoid fever, the patient may excrete the ba cilli even after 6-8 weeks postrecovery. Examples are dysentery, cholera, typhoid fever, whooping cough

(c) Healthy Carriers: Carriers that emerge from sub clinical cases/infection without suffering from overt disease but shedding the disease agent are known as healthy carriers. Persons whose infec tion remains subclinical may or may not be a car rier. For example, in case of poliomyelitis, the in fection may remain subclinical and the person may act as a temporary carrier by virtue of shed ding the organism.

-- the contrary, in tuberculosis, most people with positive tuberculin test do not actively disseminate tubercle bacilli and therefore are not labelled as carriers.

(B) By Duration:

(a) Temporary Carriers: Those carriers that shed organisms for less than a year are known as tempo rary carriers. They may be incubatory, convales cent or healthy carriers.

(b) Chronic Carriers: Carriers that keep on excreting the organisms for more than a year following an illness are known as chronic carriers, e.g. typhoid fever, Hepatitis B, dysentery, malaria, gonorrhoea and cerebrospinal meningitis.

- Chronic carriers are more important sources of infection than cases as they are serious threat to the community.

- Some disease carriers excrete the agent inter mittently and some continuously. It depends on the disease such as in typhoid fever. The carrier state may last for several years but in case of dysentery, it may last for an year or longer.
- Chronic infections have the ability to reintro duce the disease in areas which were otherwisefree from infection as in Malaria.
- The only way to control the infection is early detection and treatment.

(C) By Portal of Exit:

Carriers classified according to the portal of exit of the infectious agent are urinary carriers, intestinal carriers, respiratory carriers, nasal carriers, etc.

- Other sources include skin eruptions, open wounds and blood.
- In case of typhoid fever, urinary carrier is more serious than intestinal carrier and typhoid carrier working in food department is more dangerous thun the one working in an office.

9. a) Define indicators. Enumerate its characteristics.

(b) List down the indicators of health and discuss the indicators of health which indicate health status of a community.

(a) Indicators

• Indices are the value which are expressed of a certain quantity as compared with another. In terms of health, 'indicators' are preferred to index as indices are muchmore precise

•. Indicators are variables that help to measure the changes and provide factual information about health service performance. They are called indicators because they indicate or give clue about health status.

• Health being a holistic concept, it cannot be measured in specific units; therefore, health indicators form the base for assessment of health.

• Indicators are also useful in comparing the health status of the country with other for assessing health care needs, for managing scarce resources and for monitor ing and evaluating health services, activities andprogrammes.

• When indicators are measured sequentially over time, they can indicate direction and speed of change to compare different areas or groups of people at the same moment in time.

• Indicators help in measuring the extent to which objectives and targets being achieved.

• Indicators are mostly negative,ie they indicate lack of health or illness (morbidity) and consequences of lack of breath,ie disability or mortality.

Objectives of Health Indicators:

* To find health standard of a community
* To compare health standard of one country with that of another
* To monitor and evaluate the activities,programmes and targets of health services
* To investigate the need of health services
* To distribute the resources properly
* To perform research on health

Characteristics of Health Indicators:

Characteristics of an ideal indicator:

1. Valid: Indicators should actually measure what they are

supposed to measure. The degree to which measurement corresponds to the true state of affairs is called validity.

2. Reliable and Objective: Indicators should give the same answer when measured by different people under similar circumstances. Precision ensures objectivity

3. Sensitive: Indicators should be sensitive to the changes in the concerned situations. They should be able to reflect even small changes in health status

4. Specific: The indicators should reflect changes only in the situation concerned

5. Feasible: They should have the ability to obtain the data needed

6. Relevant: Indicators should contribute to the understanding of the phenomenon of interest

b. Types of Indicators:

Health is multidimensional and each dimension is influenced by multiple factors, some known and many unknown. Thereby, health cannot be evaluated in terms of one indicator. It requires many indicators. These are as follows:

1. Mortality indicators (MCH indicators)
2. Morbidity indicators
3.Disability indicators
4. Nutritional status indicators
5. Health care delivery indicators
6. Utilization rate
7. Indicators of social and mental health
8. Environmental indicators
9. Socioeconomic indicators
10. Health policy indicators
11. Indicator of quality of life
12. Other indicators

1. Mortality Indicators:

(a) Infant Mortality Rate: It is one of the most universally accepted indicator of health status that Provide a picture of complete population, socioeconomic conditions, availability of health services and actual status of mother and child.It is measured as:

IMR= No. of deaths of children less than 1
year of age in a given year
———————————————-X1000
Total live births in the same year

(b) Child Mortality Rate: Indicators related to overall health status in early childhood (1-4 years).It does not include infant mortality and is Computed as:

No. of deaths at ages 1-4 in a given year
———————————————------ X1000
Total number of children aged 1-4 years
at the middle of the same year

(C) Under-5 Proportionate Mortality Rate: This indicator reflects both infant and child mortality rates It is computed a

No. of under-5 deaths during a year
———————————————- X1000
Total no. of deaths during the same year

High rates indicate high birth rates, high child mortality rate and shorter life expectancy

(d) Crude Death Rate: It indicates success of health services in a country as it is a fair indicator for comparing health of people. It is calculated as:

Total no. of death in a year and locality
———————————------ X1000
Estimated mid-year population in the same year and locality

(e) Life Expectation: It is defined as the average number of years that will be lived by those born alive into a population if current age-specific mortality rate continues'. Life expectancy at birth is most frequently used. An increase in life expectation is considered as an improvement in health status.

(f) Age-specific Death Rate: It indicates specific deathrate in age group of 15-20 years and computed as:
No. of deaths of persons aged 15-20 year
during a year
———————————————-X1000
Mid-year population of persons aged 15-20 years

(g) Adult Mortality Rate: It indicates death rate between age group of 15 and 60 years per 1000
population.

(h) Maternal (Puerperal) Mortality Rate: It accounts for greatest proportion of death among women of reproductive age in most of the developing countries.

It indicates the number of women dying due to preg nancy and childbirth complications per 100,000 women of reproductive age (15-49) in a given year. (1) Disease-Specific Mortality Rate: it is computed for a specific disease in terms of case fatality rate (CFR).

CFR = No. of deaths from a specific disease

——————————————X100

No.of cases of disease during

the same time period

(j)Proportional Mortality Rate: it measures the burden of disease in a community. It is calculated as:

No.of deaths from a given disease

in a specific time period

——————————————X100

Total no.of death in the same time period

It is expressed in percentage and give an estimate of specific cause of death in relation to total deaths due to all causes. For example, CHDS account for 20%-30% of all deaths in Western countries, (k) Years of Potential Life Lost (YPLL): In indicates years of life lost through premature death.

MCH Indicators:

It includes the following

(I) Maternal Mortality Ratio: It measures women dying from puerperal causes and is computed as

No.of maternal deaths (15-49 years)

due to complications Of pregnancy,

child birth or within 42 days of delivery

in an area during a given year

MMR=_____X100,000

Total no.of live births during the sZane year in same area to women(15-49 years)

It is a pseudo rate, as denominator is not the total no.

of pregnant women at a given time.

(II) Mortality in Infant and Childhood

(a) Perinatal Mortality Rate: it indicates number of deaths occurring in perinatal period and calculated as:

$$PMR = \frac{\text{No.of still birth (after 28 weeks of gestation)+ death during first week of life in a year}}{\text{Total no.of births(live or still) in the same year}} \times 1000$$

Condition for inclusion in rate, the birth should be either

- >1000 g in weight
- >28 weeks in gestation }Either one
- >35 cm in length at birth or more

Causes of perinatal death include birth as phyxia, LBW (two-thirds of all perinatal death with less than 2.5 kg weight), birth trauma and intrauterine or neonatal infections.

(b) Neonatal Mortality Rate: it is calculated as

$$NMR = \frac{\text{No.of deaths under 28 days Of age in a year}}{\text{Total no.of live birth in the same year}} \times 1000$$

Causes of neonatal death in India include per term babies (35%), birth asphyxia (20%) pneumonia, sepsis, malformations and diarrhoea. (c) Postnatal Mortality Rate: it is computed as:

$$PNMR = \frac{\text{No. of deaths in children between 28 days and I year of age in a year}}{\text{Total live births in the same year}} \times 1000$$

Postnatal mortality rate can also be expressed as difference between infant and neonatal mortality rate.

Causes of post natal mortality includes diarrhoeal diseases,acute respiratory infections, communicable diseases, malnutrition, congenital anomalies and accidents

(d) Infant Mortality Rate: It is expressed as:

$$\text{IMR} = \frac{\text{No. of death in children less than 1 year of age in a year}}{\text{Total no. of live births in the same year}} \times 1000$$

Causes of infant mortality include combined causes of both neonatal mortality (0-4 weeks) and postnatal mortality (1-12 months)

(e) Child Mortality Rate: Computed as:

$$\frac{\text{No.of deaths at ages 1-4 years in a year}}{\text{Mid-year population of age 1-4 years in the same year}} \times 1000$$

Causes of child mortality includes:

*Diarrhoeal disease, respiratory infections, malnutrition, infectious diseases such as measles in developing countries.

*Accidents, congenital anomalies, malignant neoplasms, influenza, pneumonia in developed countries

(f) Under 5 Proportionate Mortality Rate: It is computed as:

$$= \frac{\text{No. of under 5 deaths in a year}}{\text{Total no. of deaths in the same year}} \times 1000$$

Causes include pneumonia, diarrhoea, measles malaria, meningitis, injuries and accidents.

(g) Still Birth Rate: The most widespread use o term is death of a fetus weighing 1000 g (after 28 weeks of gestation) or more during an yea per 1000 total births.

$$\frac{\text{No. of stillborn in infants in a year}}{\text{Total no.of birth (live and still) in the same year}} \times 1000$$

2. Morbidity Indicators:

It is misleading to describe health in terms of only mortality rates because they do not reveal the burden of ill health in a community. e.g illness such as rheumatoid arthritis or mental illness. Therefore, morbidity indica tors are used to supplement mortality data to describe health status of the community.

Morbidity rates used for determining ill health in a community are

- Incidence and prevalence
- Notification Rates
- Attendance rates at outpatient departments, health centers etc
- Admission,readmission and discharge rates
- Duration of hospital stay
- Spells of sickness or absence from work or school

3. Disability Rates:

The commonly used disability rates are

(1) Even type indicators, which include:

a. Number of restricted activity days

b. Bed disability days

c. Work loss days within a period

(2) Personal-type indicators

a. Limitation of mobility (confined to bed or house)

b. Limitation Of activity(eating,washing,going to toilet etc)

c. HALE(Health Adjusted Life Expectancy):It is defined as years of life cost to premature death and years lived with disability adjusted for severity of disability

e. ONE DALY - One lost year of health life

- Quality adjusted life years (QALY)
- Disability-free life expectancy(DFLE)

4.Nutritional Status Indicators:

Nutritional status indicators are positive health indicator.Important indicators of health status in terms ofnutritional health indicators are *Anthropometric measurements of preschool chil dren,i.e.weight, height and mild arm circumference · Height and weight of school going children (at the time of entry)

* Prevalence of LBW

5. Health Care Delivery Indicators:

The Indicators used are

- Doctor population ratio
- Doctor nurses ratio
- Population bed ratio
- Population per health/Subcenter
- Population per traditional birth attendant

6. Utilization Rates:

They indicate the care needed by a population and the health status of the population. A relationship existsbetween utilization of health care services and health needs and status. Some utilization rates are

• Proportion of infants who are fully immunized against six killer diseases

• Proportion of pregnant women who receive antenatal care or have deliveries supervised by trained birth attendants

• Percentage of population using different methods of familyplanning

• Bed occupancy rate= Average inpatient census

———————————-

Average number of beds

• Average length of stay = Days of care given

———————————-

Discharge

• Bed turnover ratio = Discharge

————————

Average beds

7. Indicators of Social and Mental Health:

Indirect measures are used as indicators of social and mental health because positive indicators are scarce. These include suicide, homicide, violence and other crimes, road traffic accidents, juvenile delinquency. alcohol and drug abuse, smoking. consumption of tranquilizers and obesity

8. Environmental Indicators: Environmental indicators are important because they determine the quality of environment (physical and biological) in which diseases occur and in which people live. In dicators included are related to pollution of air and water, radiation, solid waste, noise, exposure to toxic substances in food or drink. The most useful indicator for determining health status of a population is access to safe water andsanitation facilities at home or immediate vicinity.

9. Socioeconomic Indicators:

These indicators do not measure health directly but interpret indicators of health care. They are -

•Rate of increase in population
•Per capita GNP
•Level of unemployment .
•Dependency ratio
•Literacy rates (especially girl education)
•Family size
•Housing (no. of individuals per room)
•Per capita "calorie' availability

10. Health Policy Indicators: It includes:

• Proportion of GNP spent on health care services • Proportion of GNP spent on health-related activities such as water and sanitation, nutrition, education
• Proportion of total health resources available at primary health care

11. Quality of Life Indicators:

Physical quality of life indicator is a composite index combining infant mortality, life expectancy at one year of age and literacy rate. Equal weightage is given to each indicator and resulting PQLI is measured from 0 to 100. The desired goal being 100 PQLI. Currently PQLI of developed countries is 90-98 whereas that ofdeveloping countries is 30-50

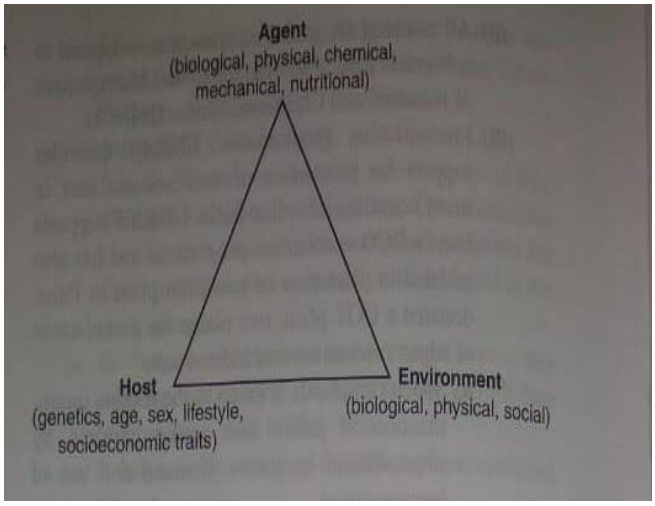
12. Other Indicators: They include:

- Social indicators
- Basic need indicators
- Health for all Indicators
- Millennium development goal indicators

10. What is Epidemiological Triad?

Ans.

The occurrence or manifestations of any disease(communicable or noncommunicable) is determined by the interactions between the agent, host and environment that together constitute the epidemiological triad. Each component con tributes to the causation of disease. When the host is weak, agent is strong and the environment is conducive to generate a response, the disease devel ops. The diseases can be prevented by controlling any one or all of these factors.



1. Agent:

An agent is defined as a substance: living or nonliving or a force tangible or intangible, the excessive presence or relative lack of which may initiate or perpetuate a disease process in a susceptible human host under proper environmental conditions.

It is a foremost factor in development of the disease. There may be a single or multiple agents for a
disease.
Disease agents are classified into:
(i) Biological Agents: These are living agents. Theyare found in men, animals, insects, soil, air and water. They are infectious in nature, generate dis ease and are poisonous. They include arthropods (mites. lice, mosquitoes), helminths, protozoa, fungi, bacteria and viruses. Their ability to cause a disease depends on:

(a) Infectivity (ability to invade or gain access and multiply in the host)
(b) Pathogenicity (ability of the agent to producedisease in the susceptible host)
(c) Virulence (ability to produce severe clinical manifestations including complications, death and sequel). It is measured by estimating CFR

(d) Susceptibility: ability of an agent to survive inthe host or in a free state.

(ii) Physical Agents: It includes excessive heat, cold. humidity, atmospheric pressure, friction, sound, electricity, radiation, light and vibration. They are usually associated with particular occupational exposure resulting in illness.

(iii) Chemical Agents: It includes two types of chemical substances:

(a) Endogenous/Internal Agents: Chemicals produced inside the body as a result of metabolic disorders or endocrine gland dysfunction, such as urea (uraemia) in renal failure, ketone bodies (ketoacidosis) in diabetes mellitus, uric acid in gout and serum bilirubin (hyperbilirubinaemia in jaundice.

(b) Exogenous/External Agents : Chemicals produced outside the body, e.g. allergens, dust, metals, alcohol, fumes, gases, lead, arsenic, insecticides etc. They are inhaled, ingested or inoculated causing illness.

(iv) Nutritional Agents: Excessive intake or relative deficiency of nutrients such as fat, carbohydrates, vitamins, minerals, proteins, fibre and water can result in nutritional disorders, e.g. anaemia, PEM, goitre, rickets, vitamin deficiencies, etc.

(v) Mechanical Agents: It includes chronic frictions with machines and mechanical forces leading to sprains, dislocation, injuries, wounds (crushing, tearing or penetrating) and even death.

2.Host:

The host is the one in whom the disease develops, i.e. the man itself. According to epidemiological theory, the human body is like soil while the disease agent is like seeds. Various factors render man susceptible to disease and the hosts are responsible for spreading the disease. It is classified into the following groups.

(i) Demographic Factors: It includes host's age, sex, ethnicity. For example, some diseases are common in childhood (measles) while some are common in old age (cataract, BPH). Some affect only females while some are found in males only (haemophilia).

(ii) Biological Factors: It includes genetic makeup (blood groups), blood chemistry, immune status,
physiological and biochemical characteristics (serum lipids, blood glucose level), nutritional status,
personality

(iii) Socioeconomic Factors: It includes an individual‘s social and economic status, education, occupation, stress, marital status, housing, etc.

(iv) Lifestyle: It includes customs and rituals, moral values, habits, nutrition, physical activity, use of alcohol, tobacco, drugs, smoking, behaviour and personality. All these factors affect the health and contribute to disease. For example, alcohol consumption leads to liver damage.

(v) Past History: Exposure to various hazards or agents in the past can also trigger the response.

3. Environment:

Environment is the third important component of the epidemiological triad. The environment of a individual plays a vital role in his health. Many preventable dis eases originate in the environment in which people live. The environment is not limited to climate of an area. Environment is defined as the aggregate of all the external conditions and influences affecting the life and development of an organism. There are three components of environment: (i) Physical Environment: It includes all the nonliving, chemical and physical factors such as air,water, soil, environmental sanitation, housing. radiation, gravity, atmospheric pressure, noise, electricity, light, seasons, climate, humidity, temperature, electronic machinery and radar. Alteration in physical components leads to various dis ease. These alternations are due to the following reasons:

(a) Increased population, urbanization, industrialization, migration, leading to increased envi ronmental pollution and increased exposure to electromagnetic and radiation energy.

(b) Defective environment such as lack of sanitation and improper disposal of waste and excreta and other malpractices such as use of insecticides and DDT.

(ii) Biological Environment: It includes living things surrounding man such as animals and plants. Many of these are infectious agents (bacteria or viruses). reservoirs of infection (rats in case of plague) or transmitters of the disease agents (mosquitoes). Sometimes, some organisms live in harmony with the humans in a coexistence interrelationship. When this harmonious relationship is disturbed,illness occurs.

(iii) Psycho-Social Environment: It includes socio economic factors, customs, education, standard of living, culture, tension and breaking up of family etc. that affect the health and mental status of an individual.

Man is in constant interaction with other people. He be ing a member of a family, a caste, a community and a nation can have similar or conflicting views, behaviours, practices, that can give rise to tension and stress be tween the people and the individual. There can be har mony or disharmony among the people that can have both positive and negative impact on the health of indi vidual and community as a whole. A favourable social environment can improve the health and quality of life. Hence, the customs and beliefs favouring health must be preserved.

Negative factors such as poverty, migration, loss of employment, birth of handicapped child and loss of dear ones can trigger stress and anxiety and other physical symptoms resulting in psychosomatic illness such as peptic ulcers and HTN.

Example of Epidemiological Triad:

A person (host) may be exposed to the virus of common cold (agent) but whether cold develops depends upon the variety of conditions (environment), i.e. poor nutrition, in adequate sleep or unusual stress before exposure predispose the host to develop a cold.

Conversely, a person who is well nourished and physically fit and who is in control of the stresses of life is less likely to develop symptoms.

Therefore, eliminating any one of the components can lead to disruption in the causation of disease.

11. Write a note on noise pollution.

- Noise is defined as an unwanted or unpleasant sound. It is posing a serious threat to not only the health of humans but also other living organisms.
- Noise is basically defined as wrong sound, in the wrong place, at the wrong time'. The twentieth century is described as the 'century of noise'.
- Sound is a basis of communication but its increased in tensity contributes in the noise pollution.
- Man is surrounded by noise everywhere whether he is an a metropolitan city such as Delhi, Mumbai and Banga lore or in a small local village.
- Presently the word noise is replaced by sound pollution. Frequency of the sound wave is denoted by hertz(Hz). One Hz is equal to one waver per second. Hu man ears can detect frequencies between 20 and 20,000 Hz. This is audible range and any frequency above 20,000 Hz is known as ultrasonic wave and those below 20 Hz is known as infrasonic waves, that are inaudible to man but audible to animals such as dogs and bats.The intensity of sound is denoted by decibels. Sound up to 80 decibels (db) is safe for humans. The sound level of normal talk is generally 60 db. A noise of 160 db can cause complete deafness. For example, sound of a jet aircraft during take off at close range can cause total deafness due to rupture of eardrums.

- Everyone has different attitude towards sound. There fore, it is difficult to describe noise. Unpleasant and un wanted sound makes a patient sad and wake him/her from sleep. Sharp sound generates stress.

- **Source of Noise Pollution**

- (1) Domestic Sites: Unwanted sounds of loudspeakers, ra dio, computer and that produced by electronic machines such as coolers, air conditioners, generators at home are some partners in crime with noise pollution. Screamingand shouting also come under noise pollution.

- (ii) Industrial Sources: Noise produced by bulldozers concrete mixers, cutting and crushing machines, plus the sound of drilling and mining add up to the noise pollution. These high-intensity sound-producing indus trial activities are a serious threat not only to the work ers but also to the people living in and around the areas.

- (iii) Road Sites: The unwanted honking of automobiles, road rage and other unpleasant activities such as excessive use of loudspeakers for the religious acts also produce painful noise. Motor cycle may produce noise of 100 db.

- (iv) Political Source: Sound pollution generated in dharma, demonstration of protest, slogan shouting, election campaigns and rallies.

- (v) Hospital Sources: Sound generated by the trolley, wheel chairs, equipment, oxygen cylinders and other machinery, sound of shoes, commotion of emergency and noise produced by their shouts and shrieks and also the wailing of relatives, at the death of the patient also contribute to noise pollution.

- (vi) Other Sources: Use of loudspeakers during different cultural and religious functions especially till late nights is very disturbing for children, elders and sick. Noise pollution is also caused due to drum beating, rock music, aeroplanes, trains, crackers and fireworks.

- **Effects of Noise Pollution**

- 1. Auditory Effects:

- (a) Auditory Fatigue: It is characterized by whistling and buzzing of ears. It appears in the 90 db region and greatest at 4000 Hz.

- (b) Deafness (Hearing Loss): It is a serious effect ofnoise pollution and can be temporary or permanent.

    - ✓ Temporary hearing loss occurs in a range of 4000-6000 Hz frequency or noise of 90 dB. The disability disappears after a period of 24 hours of exposure to noise.

    - ✓ Repeated or continuous exposure to noise around 100 dB where ears do not get a chance to recover can lead to permanent hearing loss. In this, the inner ear damage may vary from minor changes in the hair cell endings to complete destruction of the organs of Corti. Exposure to noise above 160 dB such as the sound from jet aircraft may rupture the tympanic membrane leading to perma nent deafness. When deafness is caused due to occupation in industries it is called occupational hearing loss'.

2. Nonauditory Effects:

(a) Interference with speech: Noise interferes with speech communication. The frequency causing dis turbance to speech communication lies in the 300- pri 500 Hz range that are mostly produced by road and air traffic.

(b) Efficiency: Low noise is associated with good men- sp tal concentration and high work output.

(c) Psychological Effect: Loud noise causes annoyance, tension, nervousness, anxiety, temper tan trums. It also causes fatigue, insomnia, inefficiency at work, etc. Neurotic people are more sensitive to noise than balanced people.

(d) Physiological Effects: Exposure to continuous p noise is found to affect cardiovascular system. It be increases heart rate and BP and decreases periph eral circulation. It also increases intracranial pres sure and sweat and can cause peptic ulcers. Noise interferes with sleep and is also said to cause visual disturbance by narrowing pupils, affecting colour perception and reducing night visiopeople

Prevention and Control of Noise Pollution

- Determining the limit of noise and controlling the noise through law Use of good quality silencers and muffin in the vehicles, use of insulating material at places where noise is produced, e.g. planting of trees and hedges along with roads and streets
- Heavy vehicles should not be routed in narrow streets
- Ban on horns in public places especially near hospitals and schools
- Ear plugs, ear muffs and other barriers should be used in the industrial set up, aeroplanes, factories, etc Noise-producing activities should be limited to certain hours of the day and night e.g. air flights, construction work etc
- Controlling the sound of musical instruments and loud speakers Use of soundproof material in building houses and insti tutions, etc
- Education of people regarding pollution and to promote voluntary organizations and procure public cooperation
- Division of the city into zones with separation of areas concerned with industry and transport
- House fronts should lie not less than 15 m from the roads and intervening space should be thickly planted with the bushes.
- Railway yards, aerodromes, industries should be in stalled away from residential areas
- Workers should be exposed to high intensity in the in dustries for limited hours. Workers must be regularly rooted from noisy areas to comparatively noise-free posts in factories.
- Proper maintenance of motors and machines also to be done.

- In India, making noise is punishable by law with im prisonment up to 5 years or fine up to Rs 1 lakh or both. Workers have the right to claim compensation if they have suffered a loss of ability to understand speech

12. Write a note on WHO. bon

Ans.

WHO stands for World Health Organization.
It is a specialized nonprofitable health agency established by United Nations on 7 April 1948. Its headquarters is based in Geneva.
In 1945, United Nations Organization (UNO) was established to maintain peace and security across the world. In 1946, an International Health Conference was held in New York to draft the constitution of an International Health Organization. The constitution was ratified in the same year by International Health Conference of 51 nations in New York and WHO officially came into existence on 7 April 1948. This day is hence celebrated as World Health
Day every year. Every year, a global health issue is selected and attention is given to specific aspect of public health and attempts are made throughout the year to achieve the set targets.
Although a part of United Nations, WHO is not under its administrative control. It has its own constitution, membership, executive board and budget making it a unique organization
Objectives:
The main objective of WHO is the attainment of highest standard of health by all individuals, without any discrimination on the basis of caste, religion, political or social status, pertaining to the fundamental rights of each individual The health of all people is fundamental to the attainment of peace and security and is dependent upon the full cooperation of individuals and state
The achievement of any state in the promotion and protection of health is of value to all

- Inequitable development in different countries, in the promotion of health and control of disease, especially communicable diseases, is a common danger

- Healthy development of a child is of basic importance: the ability to live harmoniously in a changing total environment is essential to such development The extension of the benefits of medical, psychological and related knowledge to all people is essential for the fullest attainment of health

Informed opinion and active cooperation on the part of the public are of most importance in the improvement of the health of the people Governments have a responsibility for the health of their people, which can be fulfilled only by the provision of adequate health and social measures

Membership:

Any country of the world can become a member of WHO whether or not a member of UN. WHO started with 61 member countries in 1948 of which India was one of its members. By 1998, WHO had 192 member states and two associate members. Each member country contributes in the budget every year and is entitled to receive services and help provided by the organization.

By 2015, WHO had 194 members, all of them being member of United Nations excluding nine and Cook Islands and two associate members.

Organizational Structure:

WHO is governed by three principal bodies:

I. World Health Assembly: It is the supreme governing body, also known as "Health Parliament of the Nations. It has delegates of all the member states, each having one vote. The assembly meets each year in May at the headquarter (Geneva) or other countries at times, as in 1961. the 14th World Health Assembly met in New Delhi (South East Asia Region). The functions of World Health Assembly are as follows:

- Formulation of health policies and programme
- Reviewing and evaluation of the previous years work done and achievements
- Sanctioning budget for the following year
- Election of member state for denignuting a person to be on executive board for 3 years
- Replacing retiring members
- Appointing director general that the Executive
- Holding technical discussions on topics of global interest Board nominates

II. The Executive Board: The board consists of 34 members who do not represent the member state. These members are technically qualified in the field of health. Of all the

members, at least three must represent each of the six WHO regions. Each member is elected for three years, with one third members retiring every year. The meeting of the board is held twice every year (January and May, after World Health Assembly meeting).The function of the Executive Board is to implement the decisions and policies of the World Health Assembly. The board also has the power to take independent decisions in case of emergency such as fonds, earth quakes and epidemics

III. Secretariat: The secretariat comprises the administrative wing that looks after the day to day technical and administrative work of the organization. It is headed by the Director General with assistance of five Assistant Director Generals and other experts. It comprises about 8000 International public servants working in 14 divisions, such as survey, communicable diseases, environmental health, mental health, health education, family health, information support system, budget and finance and manpower development

Functions/Work of WHO

1. Prevention and Control of Communicable and Non communicable Diseases:

* Almost all communicable diseases have been subjected to WHO activities at some point of time. The efforts of WHO has led to global eradication of small pox with polio on the verge of eradication. Efforts are now directed towards fight against HIV/AIDS,
* The WHO collects and disseminates the epidemiological information on diseases to International Health Regulations. WHO ensures maximum security against spread of diseases internationally,
* WHO has also placed emphasis on six killer diseases through expanded programme of immunization aiming complete immunization by 1990, It also carries out activities related to vector control immunology, quality control of drugs evaluation and monitoring drugs and health laboratory technology Attention is also paid towards non communicable discuses such as cancer, cardiovascular diseases, mental and genetic disorders, along with drug addiction

2. Development of Health Services:

One of most important functions of WHO is promoting and supporting member countries in developing health policies and national health programmes. It also help in development of health services providing emphasis on health manpower and utilization, building infra- structure and managerial capabilities and advanced health services

Appropriate Technology for Health (ATH) is a new programme by WHO to encourage selfsufficiency in solving health problems and to build up primary health care to achieve the goal of health for all

India has received help for control of communicable diseases such as TB, leprosy. VD. cholera and small pox in the field of health statistics, family planning, health education, nutrition, mental health

To improve the standards of teaching and training in health, fellowship is granted to doctors and other health experts from one country to study and train in other country.

3. Biomedical Research:

WHO itself does not conduct research or studies Instead it promotes and stimulates the work in field of health by giving grants and fellowships and standardizing nomenclature, laboratory techniques and substances such as vaccines, drugs and other bio logical products • Coordination and decision making is carried out by Global Advisory Committee in consultation with Regional Advisory Committee

WHO special programme for research and training tingets six tropical diseases (malaria, schistosoma sis. filariasis, leishmaniosis. trypanosomiasis and leprosy) so that new tools can be made and the institutions remain strengthened

4. Family Health:

WHO has included Family Health Programme in 1970 with an aim to improve quality of family as a unit. The main components under this programme are matemal and child health, human reproduction nutrition and health education.

5. Environmental Health:

WHO has always prioritized environmental health to promote world community health. The WHO advises member states about provision of basic sanitary services, safe drinking water food and prevention of air pollution

WHO has developed various programmes...

WHO Environmental Health Criteria Programme and WHO Environmental Health

Monitoring Programme for improving environmental health

6. Health Statistics:

The WHO collects, compiles and disseminates information on morbidity and mortality statistics related to health problems. The statistics are published weekly, quarterly or annually that are available in WHO headquarters at Geneva. WHO also reviews and

publishes International Classification of diseases' every 10 years. The 10th revision of ICD became effective on 1 January 1993

WHO also assists member states in improving their medical records and in planning and operating national health information system.

7. Health Literature and Publications:

- WHO acts as a house of information on diverse health problems and issues that are maintained at a well-stocked library at all headquarters. WHO li- brary is one of the satellite centres for MEDLARS(Medical Literature Analysis and Retrieval System). MEDLARS cover the whole of medicine on an inter national basis
- Some of the publications include: bulletin of WHO, WHO chronicle, World Health (monthly), weekly epidemiological report, World Health Forum, WHO monograph series, etc.

8. Cooperation with Other Agencies/Organisations:

WHO collaborates with United Nations and other specialized agencies of UN such as FAO, ILO and UNICEF as well as other international government organizations such as CARE and USAID.

WHO in India:

*Activities taken up by WHO in India are

* Eradication of malaria
* Control of tuberculosis
* Quality control of drugs
* Maternal and child health
* Mental and dental health
* Aids for medical and nursing education
* Manufacture of vaccines
* Health records and statistics
* Medical rehabilitation
* Administration and laboratory services

13. Write a note on UNICEF.

Ans :

UNICEF stands for United Nations International Children's Emergency Fund. It is a specialized agency established by General Assembly of United Nations on December 11, 1946 to deal with rehabilitation of children lected by war. I aimed at providing emergency relief to children affected by war. It aimed at providing emergency relief to children deval-tied by World War II. After the war was over the UN General Assembly decided to continue the agency towards welfare of children all over the world. In 1953, it was named as United Nations Children's Fund but the original name UNICEF was retained and it become a permanent organization.

The headquarter of UNICEF is at United Nations, New York, USA. It operates through its seven regional offices. The South Asian regional office is based at New Delhi which covers Afghanistan, Bangladesh, India, Maldives, Mongolia, Nepal, Pakistan and Sri Lanka.

It is governed by executive board of 36 nations that make policies, approves programmes and overseas administrative and financial plans. Each member has a tenure of three years

and every year one-third of members are elected by United Nations Economic and Social Council

UNICEF works in close collaboration with WHO and other specialized ngencies of the UN such as UNESCO FAO, ÚNDP, UNPF ILO and UNAIDS.

Eurlier UNICEF worked with WHO on prevention and control of communicable diseases such as tuberculosis Jariti, vonereal diseases, leprosy through various activities on all three levels ce primary. Necondary and tertiary level).

Later the focus also shifted to the fields of nutrition maternal and child health, environmental sanitation and health education

Contribution of UNICEF in India

1. Health: It includes providing aid for maternal and child health. Activities include the following

(1) Developing rural health services. Delivering set- vices economically at the village level through part time primary health workers such as ANM anganwadi workers and stich workers through active participation of co(i) All essential drugs and equipment are supplied to subcentre, PHC, FRU for Integrated Management of Neonatal and Childhood Illness (IMNC).

(iii) Immunization Programmes: UNICEF provides support for production of vaccines and sera in many countries including India UNICEF supports India's BCG vaccination programme and has also assisted in plantation of penicillin plant in Pune. donated a DOT plant, two plants for manufacture of triple vaccination and iodised salt.

11. Special emphasis is given to the routine immu nization of infant and young children by improvement in access demand and use of immunization

b. Introducing Hepatitis B in routine immuni zation

c. Supporting national efforts towards polio erad- ication, measles control and neonatal tetanus elimination

(iv) Control of Communicable Diseases: By assisting in environmental sanitation programmes for safe

drinking water and other sanitation practices (w) Medical Education and Training: Skilled men

dance for maternal and newborn care by focusing on quality, availability and use of essential obstet rie and newborn care

ia. Training of TBS in districts with less than 30% safe deliveries

b. Creating awareness and ability to recognize the complication among health workoni, family and community

c. Assisting in developing information, educa tion, community (IEC) material

d. Training in emergency obstetric and neonatal care management (vb) Reinforcing monitoring systems and data collec tion supporting operation research facilitating documentation and assessing quality of service to

make data-based decisions. 2. Nutrition:

() UNICEF gives high priority to child nutrition. It aims at reducing and preventing malnutrition in Indian children that pose a threat to their growth and development.

(in Aids applied nutrition programme in collabora tion with FAO through community development. agricultural extension services and school health services,

(i) Aided child nutrition by development of low-cost protein-rich food mixtures in mid-1950s (iv) Supplies equipment to modem dairy plants in India

based in various locations such as Maharashtra

Gujarat, West Bengal, Kamataku. Uttar Pradesh

and Andhra Pradesh

(v) Provision of supplementary nutrition to children to prevent deficiency disease

in. Large doses of vitamin A interophthalmia prevalent areas

b. Enrichment of salt with lodine in goitre endemic areas e Iron and folate supplement to combat anemi

in adolescent girls (v) Extends support in development of National Nutrition Mission and National and State Plans of Action on nutrition

3. Education:

• In association with UNESCO, UNICEF is helping

India in strengthening science by providing science laboratory equipment, workshop tools. library books, supplying audio visual aids to the educational instit ions:

• UNICEF also extends its support in Government Sarva Shiksha Abhiyan (SSA) addressing the learn ing needs of child holistically and without any gen der discrimination.

• UNICEF also promotes access and quality of educa tion to disadvantaged group.

• It also focuses on improving and enhancing cock tional data and data analysis for purpose of policy development, scope of improving teaching learning process, programme planning and implementation 4. Environment

(O The aim is to improve the care of children and provide a safe and conducive environment for healthy start in life of the children especially of poor and marginalized communities. The UNICEF along with Govt. of India focuses on:

(i) Promotion of personal, home hygiene and amita tion habits (i) Provision of safe drinking water by promoting use of ground water and periodic community based

water quality surveillance (is) Promoting school sanitation and hygiene edu cation

(v) Aiding community with naal water supply and sanitation and fresh water resources to achieve sustainability, even during drought

(vi) Supporting the existing programmes water and sanitation by strengthening policies, standards and regulatory frameworks

5. Social Welfare

• UNICEF also supports national objective to mduce

prevalence of HIV/AIDS among children and s

impact on them by prevention of mother to child transmission creating awareness about the disease through education Promoting child wately and safe motherhood pre

grame (CSSM)mmunity,Working towards elimination of child labour and violence • Working towards prevention of trafficking and com mercial sexual exploitation of children

• Providing support to children in difficult situations by upscaling and counselling that are community and family based

Creating awareness on the child rights issues through media and IEC system that aims at changing the be haviour of the community, favouring child survival. development and protection

Achievements and Participations

Since 1976 UNICEF has been contributing to UBS (Urban Basic Service) that aims to improve the quality of survival and development of children in low economie groups of some areas by upgrading basic services such as health, nutrition, water supply, sanitation and education. UNICEF also promotes a campaign known as GOBI cam paign to encourage child health.

G - Grown chart to monitor development in children 0 - Oral rehydration to treat dehydration

B - Breastfeeding

I - Immunization against six killer diseases

UNICEF gave importance to mothers and started literacy

programmes for women UNICEF received Noble Peace Prize in 1965.

Baby Friendly Hospital Initiative (BFHI) was started in June 1991 with an objective to create awareness about im portance of breastfeeding,

In 2008, UNICEF partnered with World Food Programme to supply ready to use therapeutic food for severely mal nourished children in Africa.

UNICEF also introduced HIV testing and counselling in routine pregnancy screening for first time in many countries in 2008.

UNICEF at present operates in 191 counties covering pro grammes related to survival, protection and development of child such as immunization, supplementary nutrition, growth monitoring, management of diarrhoea, safe drink ing water, sanitation, child spacing, girl education and in come generating activities for women.