ENVIRONMENTAL HEALTH.

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Objectives

1. **Types of environment**
   (Biological,Physical,Socio-cultural,political and economic)
2) **Food safety & hygiene**

- types of food
- methods of food preservation and storage
- food control
- food poisoning
- food production
- disease spread by contaminated food

Cont..

3) **Water and sanitation**

- ✓ Sources of water
- ✓ Contamination of water
- ✓ Methods of protection of water sources
- ✓ Purification of water
- ✓ Common diseases brought by contaminated water (water borne diseases)

4. **Housing**

- ❖ Housing condition
- ❖ Diseases caused by poor housing

Cont..

5. **Excreta disposal**
- ✓ Methods of excreta disposal
- ✓ Diseases associated with excreta disposal
6. **Air and ventilation**
- o Methods of ventillation
- o Diseases associated with poor ventillation
7. **Control of vectors/pests**
- ➢ Flies
- ➢ Rodents
- ➢ Mosquitoes
- ➢ Bedbugs

Cont…

- ➢ Ticks
- ➢ Lice

8. **Pollution**

- ✓ Definition
- ✓ Types of pollution
- ✓ Prevention of pollution
- ✓ Diseases associated with pollution

Cont..

9. **Occupational health and safety**

- Definition
- Occupational health and safety act
- Role of occupational health and safety nurse

Definition of Environment

This word has a great importance in our life. The simple definition of environment is the ‘surrounding'. It is what surrounds a thing. We can also define it as, "environment is the combination of all of physical and organic factors that act on a living being, residents, or ecological society and power to its endurance and growth".

Health

- Defined as being "a state of complete physical, mental, social well-being and not merely the absence of disease and infirmity.
- **Environmental Health**

  This comprises those aspects of human health, including quality of life, that are determined by physical, chemical, biological, social, and psychosocial processes in the environment. It also refers to the theory and practice of assessing, correcting, controlling, and preventing those factors in the environment that can potentially affect adversely the health of present and future generations"

TYPES OF ENVIRONMENT

1. The Physical environment

- It is also known as a-biotic environment and natural environment.
- The meaning of ‘a-biotic’ or ‘physical’ is non living like land, water, air conditions, atmosphere which constitutes soil. So we can say that physical or a-biotic environment is the environment which includes non living or physical things which are constituents of soil and affect the living things.
- The physical or a-biotic environment also includes the climatic factors such as sunbeams, rainwater, precipitation, moisture, pressure and wind speed.

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2. Biological (Biotic) environment

- It is also known as biological environment and organic environment.
- In the opposite side of the physical environment, the biotic or biological environment is responsible for the living beings.
- You have already understood that the meaning of 'biological' is living things. So, the biological environment is the environment which involves the living part of the earth.

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3. Social - cultural environment

- This type of environment involves the culture and life style of the human beings.
- The social or cultural environment means the environment which is created by the man through his different social and cultural activities and thinking.
- The historical, cultural, political, moral, economic aspects of human life constitute to the social or cultural environment

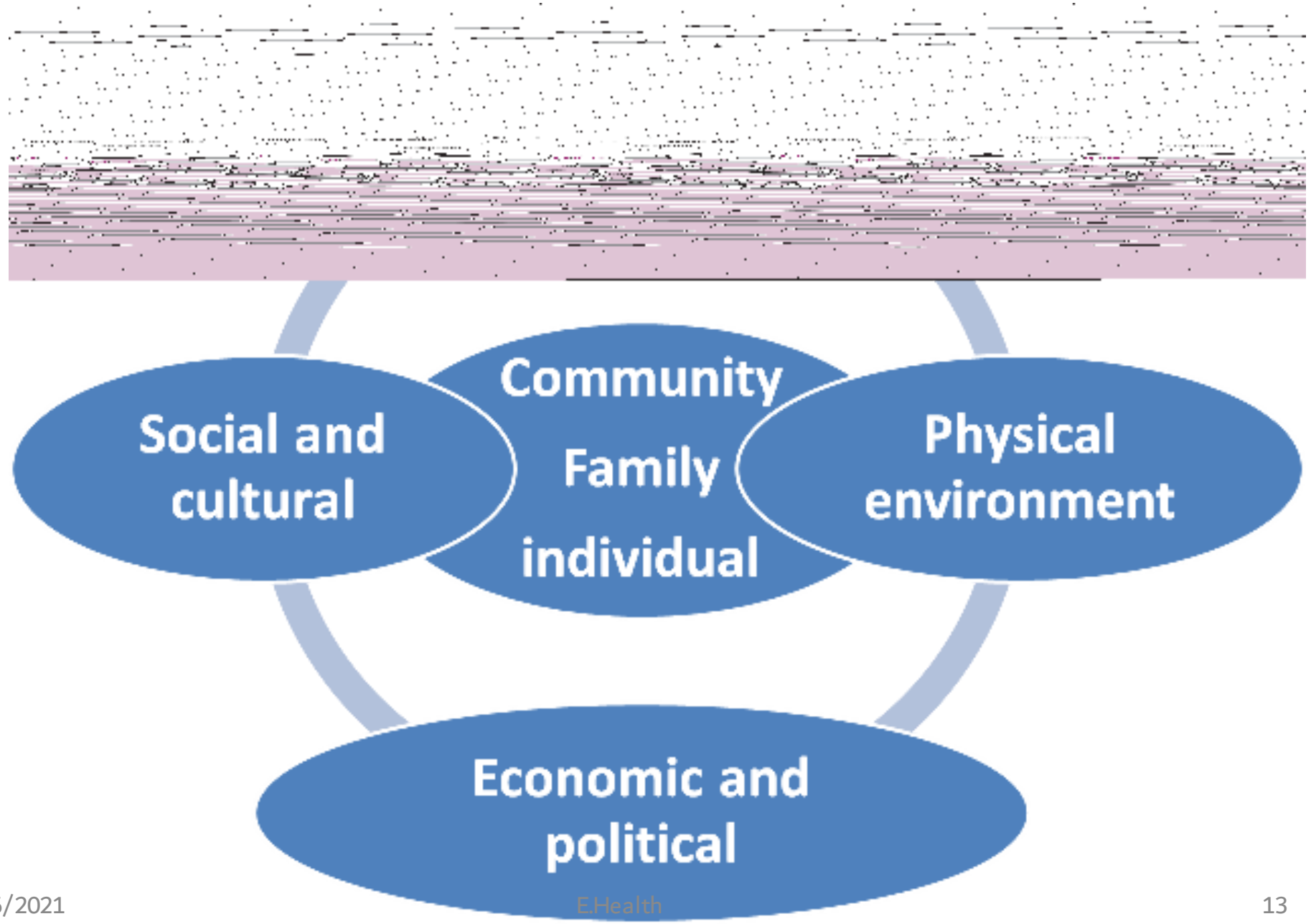
cont

4. Economic and Political environment

Is made up of work, money, and government

- Local community organisation and self-reliance
- Rural and urban economies
- Political organisation
- Development policies

The environmental factors influencing individual, family and community



Food Safety and Hygiene

Types of food:

In order to understand how we can enjoy greater health and wellbeing, we need to understand something about food. There are four essential groups of food.

Food is often classified as:

- Carbohydrate, including Fibre
- Protein
- Fat
- Vitamins and Minerals

Methods of food preservation and storage

Food preservation:

Refers to processes involved in protecting food against microbes and other spoilage agents to enhance the shelve life and to permit its future consumption.

Reasons for food preservation:

- Protect food against microbes and other spoilage agents
- Ensure that food is safe for future consumption
- Prolong food storage time
- Allow many foods to be available year round in great quantity and the best quality.

Cont'd

- **FAT TOM** is a mnemonic device that is used in the food service industry to describe the six favorable conditions required for the growth of food borne pathogens. It is an acronym for **food, acidity, time, temperature, oxygen** and **moisture**.

Care of food at home

- Food should be fresh and carefully selected when buying.
- Food should be stored in clean containers in a cool shady place e.g. calabash, wooden or plastic containers or refrigerator.
- The container should have a lid to exclude air, dust, flies and vermin. (air contains fungal spores that will make food mouldy in dumb weather, air also contains yeast which cause fermentation)
- Raw foods are often contaminated and should be thoroughly cooked (e.g flour, meat, fish, beans)

cont

- Food should be eaten as soon as it is cooked or otherwise cooled quickly and put in a fridge.
- Fresh cow's milk should be boiled at home.
- Boiled water should be used in food preparation and cooking.
- Any bad, smelly or decaying food should not be eaten.
- Fruits and vegetables should be washed before eating.

Methods

1.Drying

- One of the oldest methods of food preservation is by drying, which reduces water activity sufficiently to prevent or delay bacterial growth. Drying also reduces weight.

2.Freezing

Freezing turns about 95% of water in food to ice, thus unavailable for reactions to occur, and prevents microorganisms from multiplying.

3.Curing

Salting or curing draws moisture from the meat through a process of osmosis. . Nitrates and nitrites are also often used

Cont'd

4.Pickling

Food is kept in vinegar since micro-organisms can not grow well in low pH value solutions.

5.Modified atmospheric packaging (MAP)

- MAP is a way to preserve food by operating on the atmosphere around it. Salad crops which are notoriously difficult to preserve are now being packaged in sealed bags with an atmosphere modified to reduce the oxygen (O_2) concentration and increase the carbon dioxide (CO_2) concentration.

6.Fermentation

This is the breakdown of carbohydrates by enzymes action under anaerobic conditions.

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6.Smoking:

Preservative action is provided by such bactericidal chemicals in the smoke as formaldehyde and creosote(antiseptic obtained from wood tar) and by the dehydration that occurs in the smoke house.

7.Blanching:

Mild heat treatment, usually applied to fruits and vegetables to denature enzymes. It is often used before freezing of fruits and vegetables.

8.Pasteurization:

High temperature short time(HTST) (71.7^{0}c for 15 sec)

Ultra high temperature(UHT) (150^{0}c for 1or 2 sec)

Cont'd

10.Irradiation

Irradiation of food is the exposure of food to ionizing radiation either high-energy electrons or X-rays from accelerators, or by gamma rays (emitted from radioactive sources as Cobalt-60 or Caesium-137).

11.Canning and bottling

Canning involves cooking food, sealing it in sterile cans or jars, and boiling the containers to kill or weaken any remaining bacteria as a form of sterilization.

Food poisoning

This is an acute syndrome with nausea, abdominal cramping, vomiting and/or diarrhea which appear suddenly and within 48 hours after ingestion of food contaminated with pathogenic bacteria, viruses or toxins produced by bacteria. Depending on the contaminant, other symptoms such as chills and fever, bloody stools, dehydration, and nervous system damage may follow and can lead to death

Causes of food poisoning

The known causes of food poisoning include infective agents and toxic agents.

- Infective agents include viruses, bacteria, and parasites.
- Toxic agents include poisonous mushrooms, improperly prepared exotic foods (such as barracuda), or pesticides on fruits and vegetables.

Cont'd

- Food usually becomes contaminated with these agents from poor sanitation or preparation.
- Food handlers who do not wash their hands after using the bathroom or have infections themselves often cause contamination.
- Improperly packaged food stored at the wrong temperature also promotes contamination.
- Three of the most important causes of food poisoning are the salmonella, clostridium botulinum and staphylococcal organisms.

INSPECTION OF FOOD PREMISES

Food premise

This is the building or part thereof used for or used in connection with the sale and consumption, preparation, packaging, conveying or storing such food.

The goal of the Food Premise Inspection Program is to protect the public by achieving and maintaining the highest possible level of food safety in food premises.

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Procedure of inspection

Check for the following:

- ❑ compound
- ❑ Structural aspect of the premise
- ❑ Equipments, utensils, contact surfaces
- ❑ Sanitary facilities
- ❑ Portable water
- ❑ Drainage must be adequate
- ❑ Means of refuse disposal should be provided

Food borne diseases

- Food borne diseases are **caused by consuming contaminated foods or beverages**. Many different disease causing microbes, or pathogens, can contaminate foods, so there are many different food borne infections. In addition, poisonous chemicals, or other harmful substances can cause food borne diseases if they are present in food.

Examples food borne diseases

- Include the following:
- Dysentery
- Cholera
- Parasitic ova
- Typhoid fever
- Polio
- Hepatitis A
- Chemical food poisoning
- Brucellosis
-Bacterial infection e.g. Salmonellosis, Botulism etc
- Anthrax

WATER AND HYGIENE

SOURCES OF WATER

- Groundwater: The water emerging from some deep ground. Such water may emerge as springs, or may be extracted from boreholes or wells.
- Upland lakes and reservoirs: Typically located in the headwaters of river systems, upland reservoirs are usually sited above any human habitation
- Rivers, canals and low land reservoirs:
- Rainwater harvesting which collects water from the atmosphere can be used especially in areas with significant dry seasons
- Desalination of seawater by distillation

Uses of Water

i. For personal hygiene, washing clothes and keeping the environment clean.
ii. Irrigation and watering of crops.
iii. Drinking and cooking.
iv. Industrial processes.
v. Sanitation and waste disposal.

Uses of Water

Water is used in various ways. These include:

- Water is used in various ways. These include:
- Human consumption for body needs
- Animal watering
- Industrial use for manufacturing
- For recreational activities such as swimming
- To produce electricity
- Sustaining of aquatic life, for example, fish for consumption and export
- Household purposes like washing and cooking

Types of water

- ✓ Rain water
- ✓ Storm water
- ✓ River water/ Lake water
- ✓ Ocean water
- ✓ Domestic water
- ✓ Industrial water
- ✓ Drinking water
- ✓ Agricultural water
- ✓ Irrigation water
- ✓ Sewage etc.

Contamination of water

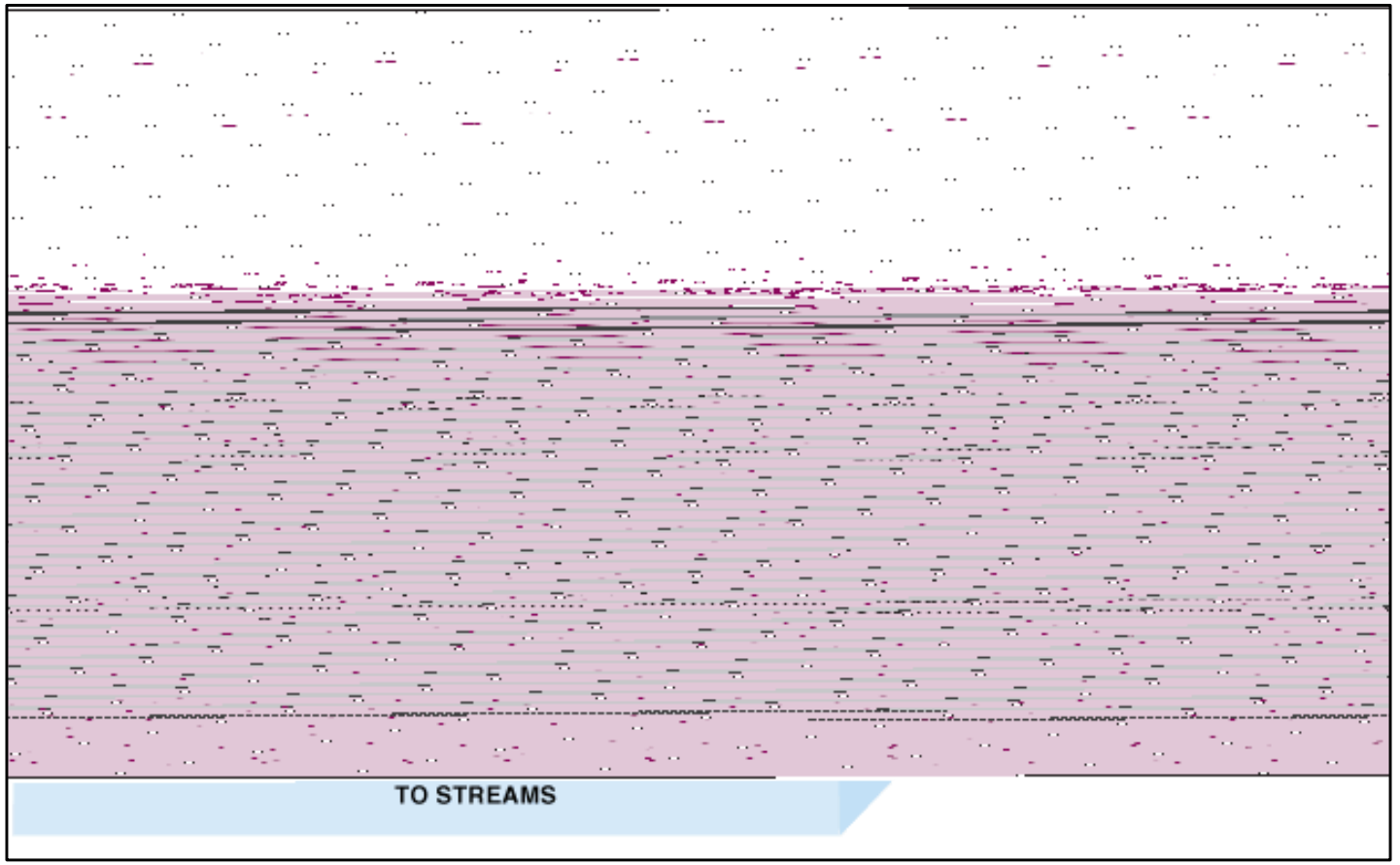
Throughout most of the world, the most common contamination of raw water sources is from human sewage and in particular human fecal pathogens and parasites.

- Chemical and other contaminants - may include organic and inorganic substances e.g. Detergents, Petroleum, Insecticides and herbicides, Chemical waste as industrial by-products ,Fertilizers containing nutrients--nitrates and phosphates

Causes of water pollution

- **Sewage** and organic waste.
- **Chemical pollutants** and other toxic materials from industrial processes.
- **Fertilizers** and other nutrients that cause eutrophication (a process where water bodies such as lakes become concentrated with nutrients leading to growth of algae and other organisms).
- **Bacteria** and other **microbiological agents.**
- **Silts and other solids** that do not easily dissolve in water and which obstruct water flow.
- **Pesticides** and other agricultural processes.

Identify the sources of water pollution



Ways in which domestic Water becomes contaminated

- Use of dirty containers for fetching drinking water
- Use of contaminated containers or covers such as leaves
- Use of dirty contaminated containers in storing
- Contamination of drinking water by domestic animals e.g. dogs and poultry
- Objects fallen into uncovered receptacles
- Dirty hands of people drawing drinking water.

Summary of Water-Associated Diseases

Type of Disease	Cause	Example
Water-washed	Due to lack of adequate water: a) For washing hands, utensils and vegetables. b) For washing face, eyes and body.	1. Dysentery 2. Diarrhoea 1. Skin diseases 2. Eye diseases
Water-borne	Due to water containing disease-causing organisms.	1. Typhoid 2. Cholera 3. Amoebiasis 4. Hepatitis A
Water-related	The vector needs water for its life cycle.	1. Malaria 2. Schistosomiasis 3. Onchocerciasis

Water purification

- **Process of removing undesirable chemicals, materials, and biological contaminants from contaminated water**. The goal is to produce water fit for a specific purpose. Most water is purified for human consumption (drinking water)
- water purification may also be designed for a variety of other purposes, including meeting the requirements of medical, pharmacology, chemical and industrial applications

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The purification process of water may reduce the concentration of particulate matter including suspended particles, parasites, bacteria, algae, viruses, fungi; and a range of dissolved and particulate material derived from the surfaces that water may have made contact with after falling as rain.

Methods of purification

- physical processes such as filtration and sedimentation
- biological processes such as slow sand filters or activated sludge
- chemical processes such as flocculation and chlorination
- electromagnetic radiation such as ultraviolet light.

Microbiological Water Quality Standard

Coli-form bacteria are a commonly used bacterial indicator of water pollution.

- Therefore, the following tolerance limits have been generally accepted by WHO for routine samples.
- E . coli should not be detectable in any sample of 100ml
- No sample of 100ml should contain more than three coli-form organisms

Cont'd

- coli-form organisms should not be detectable in any two consecutive samples of 100ml from the same or a closely related sampling point. For any given distribution system, coli-form organisms should not occur in more than 5 % of routine samples, provided that at least 50 samples have been examined at regular intervals throughout the year

HOUSING

We define a ‘house’ as the usual residential home of an individual or family.

Housing and health

The association between housing conditions and physical and mental ill health has long been recognized and there are a broad range of specific elements relating to housing that can affect health outcomes. These include:

- Agents that affect the quality of the indoor environment such as indoor pollutants (e.g. asbestos, carbon monoxide, radon, lead, moulds and volatile organic chemicals)

Cont'd

- Cold, damp, housing design or layout (which in turn can affect accessibility and usability of housing), infestation, hazardous internal structures or fixtures, noise.
- Factors that relate more to the broader social and behavioral environment such as overcrowding, sleep deprivation, neighborhood quality, neighborhood safety and social cohesion.

Aspects of poor housing that can adversely affect health

Dampness

- A strong association has been found between damp, mouldy housing and an increased prevalence of respiratory conditions (particularly asthma) and skin problems.
- Damp conditions can also aggravate existing respiratory conditions such as bronchitis and tuberculosis. Other agents which are detrimental to health, such as viruses and bacteria, may also thrive in moist conditions

Cont'd

- cold temperature is the main contributor to dampness , alongside a range of other factors such as substandard construction materials, poor ventilation and inefficient heating.

Indoor* pollutants *and infestation

-The risks and health hazards of building fabric and indoor air quality indicate that the highest health risks is associated with house dust mites, environmental tobacco smoke and carbon monoxide.

- Acute cardiopulmonary impairment is the main effect and vulnerable groups such as older people and asthmatics are most at risk.

Cont'd

Home safety

- Accidents can also be caused by poor housing conditions.

Overcrowding

Overcrowding is another factor that can adversely affect health, although in common with other housing-related components, it can interrelate with other factors so that it is difficult to measure its precise effect. For example, overcrowding, family income, energy efficiency, design and location of the property may in turn influence other housing-related factors, such as damp, cold, noise penetration, smoking behaviour and indoor air quality

summary

- Cold, damp and mouldy conditions in the home can exacerbate or even precipitate various symptoms and illness such as respiratory and cardiovascular disease, asthma, arthritis, e.t.c
- The cold and damp in turn aggravates circulatory diseases, which can lead to strokes and heart attacks or respiratory illnesses such as bronchitis or pneumonia
- Poorly ventilated homes increase the prevalence of house dust mites; mould or fungal growths result from dampness and/or high humidity. These airborne pollutants can trigger allergic symptoms such as rhinitis, conjunctivitis, eczema, cough and wheeze

Summary cont'd

- Other diseases .e.g. Tuberculosis, skin diseases may arise due to overcrowding.
- Anxiety and depression increase with the number of housing problems.

VENTILATION

Defn

Ventilation is the process by which 'clean' air (normally outdoor air) is intentionally provided to a space and stale air is removed.

Types of ventilation

Cross ventilation

When applied to room means, ventilation by openings in two adjacent walls.

Through ventilation

As applied to a room means ventilation by openings placed in opposing walls of a room

Methods of ventilation

Divided into two categories:

a) **Natural ventilation**

- Means the admission of fresh air and removal of impure air to outside air without the use of fans or other mechanical aids.

- The simplest form of natural ventilation is by open doors and windows.

- To secure the best results the windows should be placed on opposite side of the room giving through ventilation where impracticable, a cross ventilation may be provided by placing windows on two adjacent walls.

Methods cont'd

b) artificial ventilation

Sometimes called mechanical because it is assisted by mechanical apparatus.

It is used in :-

I. Large buildings where owing to the situation or design through or cross ventilation cannot be produced for all rooms.

II. In cinema or similar halls which must darkened during use.

III. In any building where the quality of air, temperature, humidity etc must be strictly controlled

Systems of artificial ventilation

1. **Extract system(exhaust/vacuum)**

   Foul (vitiated air) is exhausted by means of a fan and fresh air enter to take its place through doors and windows and other natural openings. Is particularly useful in factory, large kitchen etc.

2 **Plenum system (propulsion/input)**

   Fresh air is compelled or forced into the rooms by means of a fan. Vitiated air finds its own way out through natural openings. Used mostly in offices.

Systems cont'd

3 Balanced system

This is a combination of plenum and extraction system where both the incoming air and vitiated air are ducted. This system is extensively used in public buildings such as theaters and in large blocks of offices.

4 Air conditioning system

Same as the balance system but is a more elaborate form and includes apparatus for cleaning, heating, cooling, humidifying the air. Air is brought from the purest source available usually at the windward side of the highest part of the building through an intake duct to an air conditioning plant.

Methods of excreta disposal

1. Open defecation

Where there are no latrines people resort to defecation in the open. This may be indiscriminate or in special places for defecation generally accepted by the community, such as defecation fields, rubbish and manure heaps, or under trees. Open defecation encourages flies, which spread faeces-related diseases.

Methods cont'd

2. Shallow pit

People working on farms may dig a small hole each time they defecate and then cover the faeces with soil. This is sometimes known as the "cat" method. Pits about 300 mm deep may be used for several weeks. Excavated soil is heaped beside the pit and some is put over the faeces after each use. Decomposition in shallow pits is rapid because of the large bacterial population in the topsoil, but flies breed in large numbers and hookworm larvae spread around the holes.

3. Simple pit latrine

This consists of a slab over a pit which may be 2 m or more in depth. The slab should be firmly supported on all sides and raised above the surrounding ground so that surface water cannot enter the pit. If the sides of the pit are liable to collapse they should be lined. A squat hole in the slab or a seat is provided so that the excrete fall directly into the pit.

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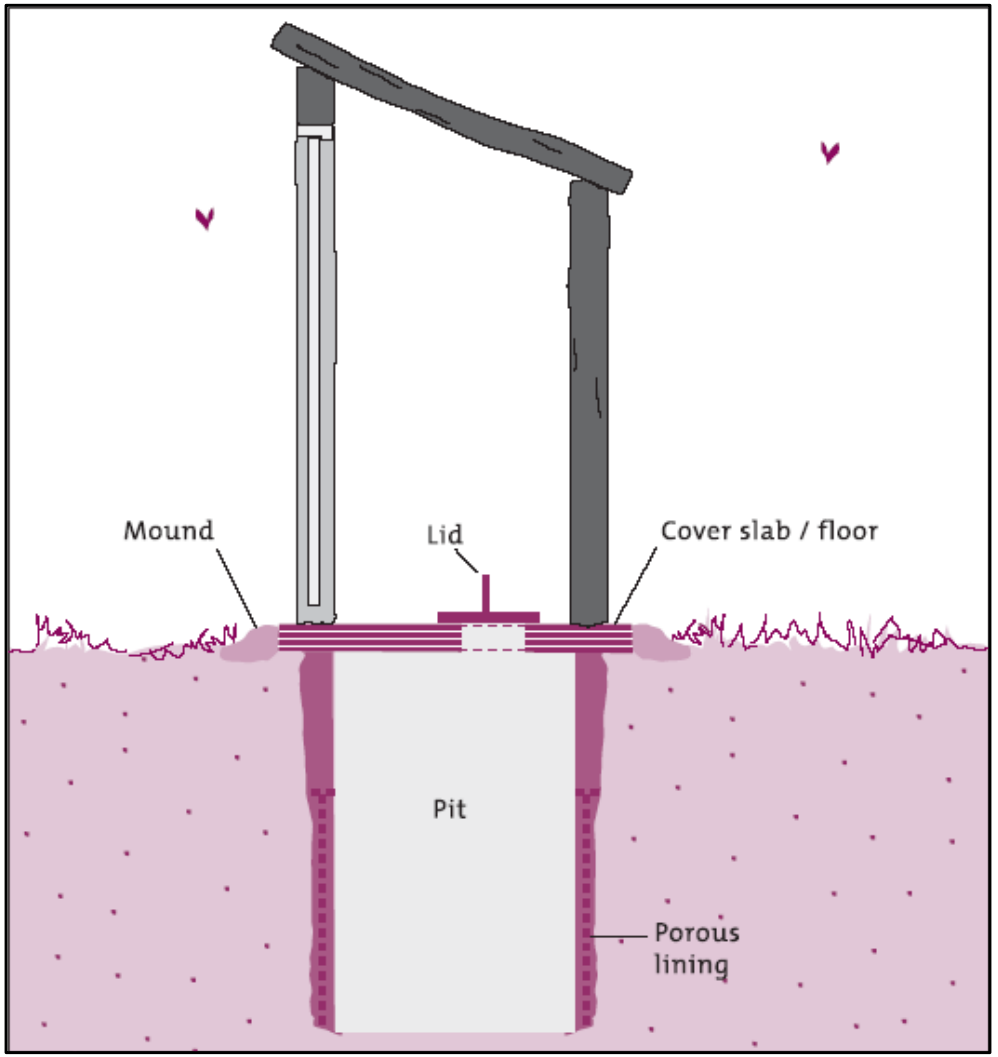

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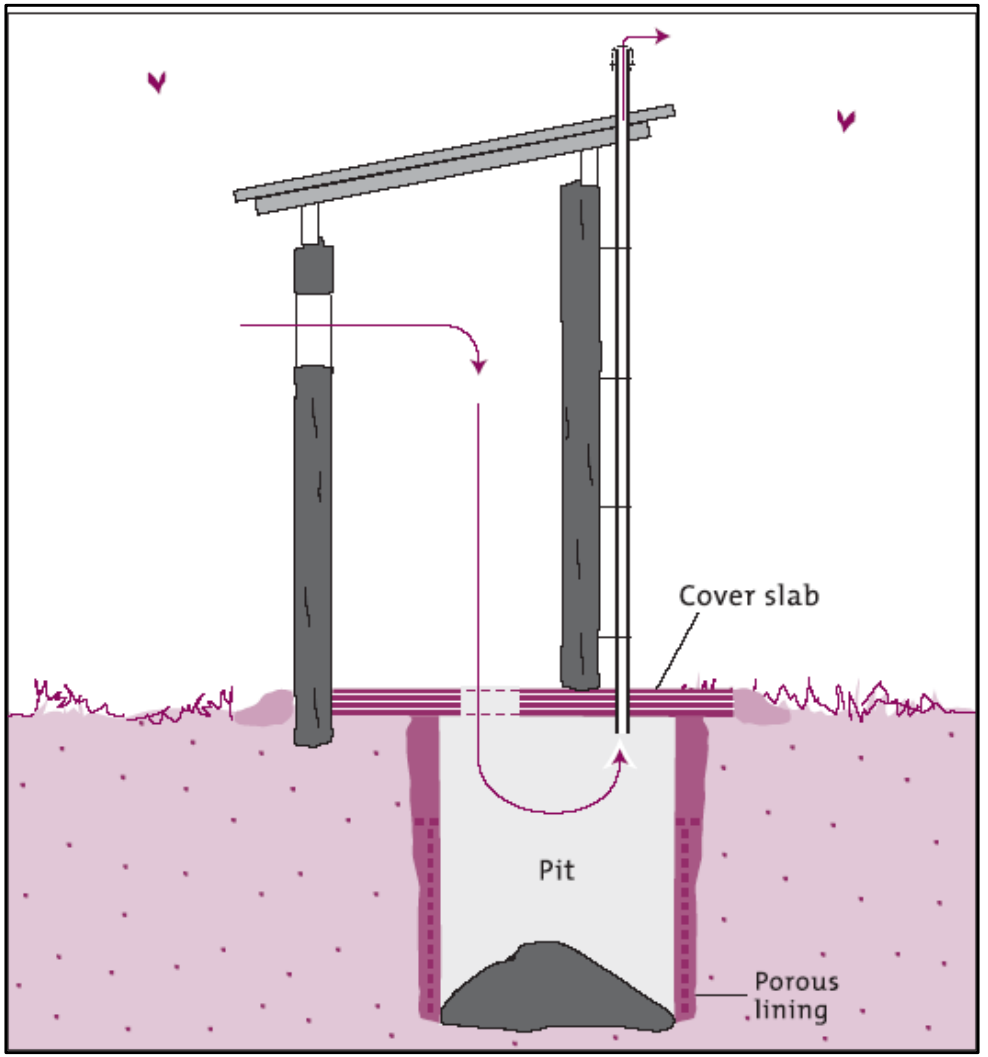
4. Ventilated pit latrine

Fly and odour nuisance may be substantially reduced if the pit is ventilated by a pipe extending above the latrine roof, with fly-proof netting across the top. The inside of the superstructure is kept dark. Such latrines are known as ventilated improved pit (VIP) latrines.

VIP Pit Latrine



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5. Pour-flush latrine

A latrine may be fitted with a tap providing a water seal, which is cleared of faeces by pouring in sufficient quantities of water to wash the solids into the pit and replenish the water seal. A water seal prevents flies, mosquitos and odours reaching the latrine from the pit. The pit may be offset from the latrine by providing a short length of pipe or covered channel from the pan to the pit. The pan of an offset pour flush latrine is supported by the ground and the latrine may be within or attached to a house.

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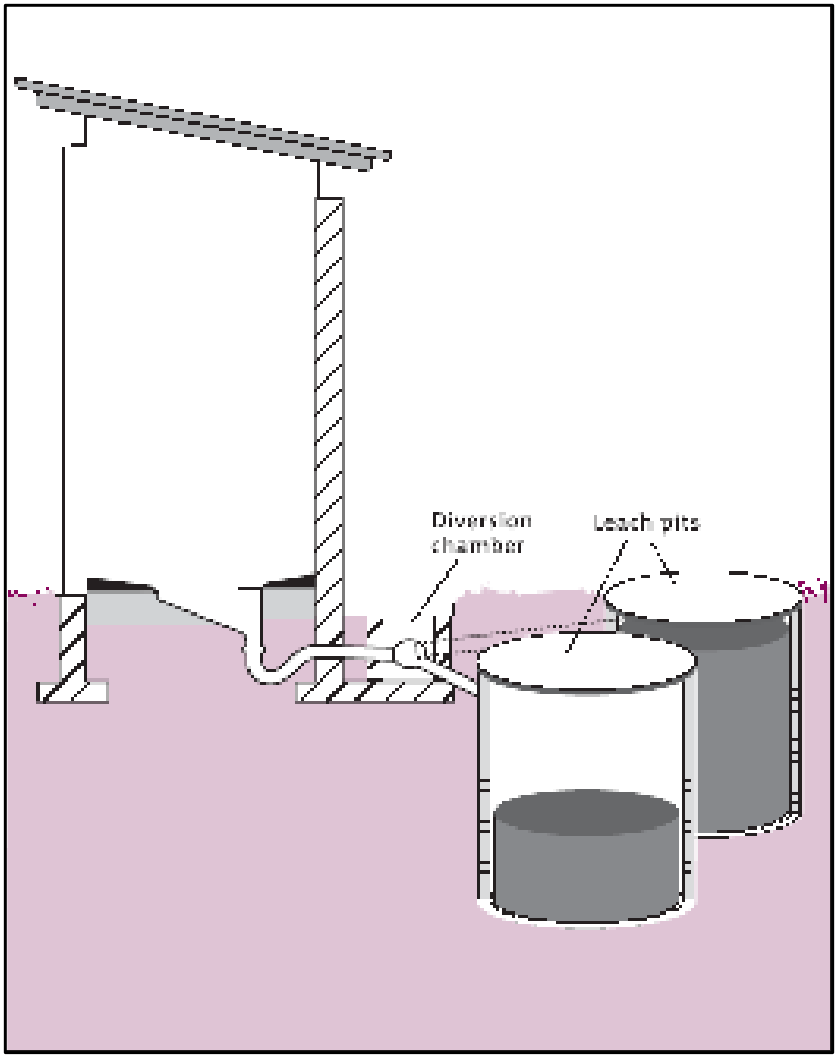
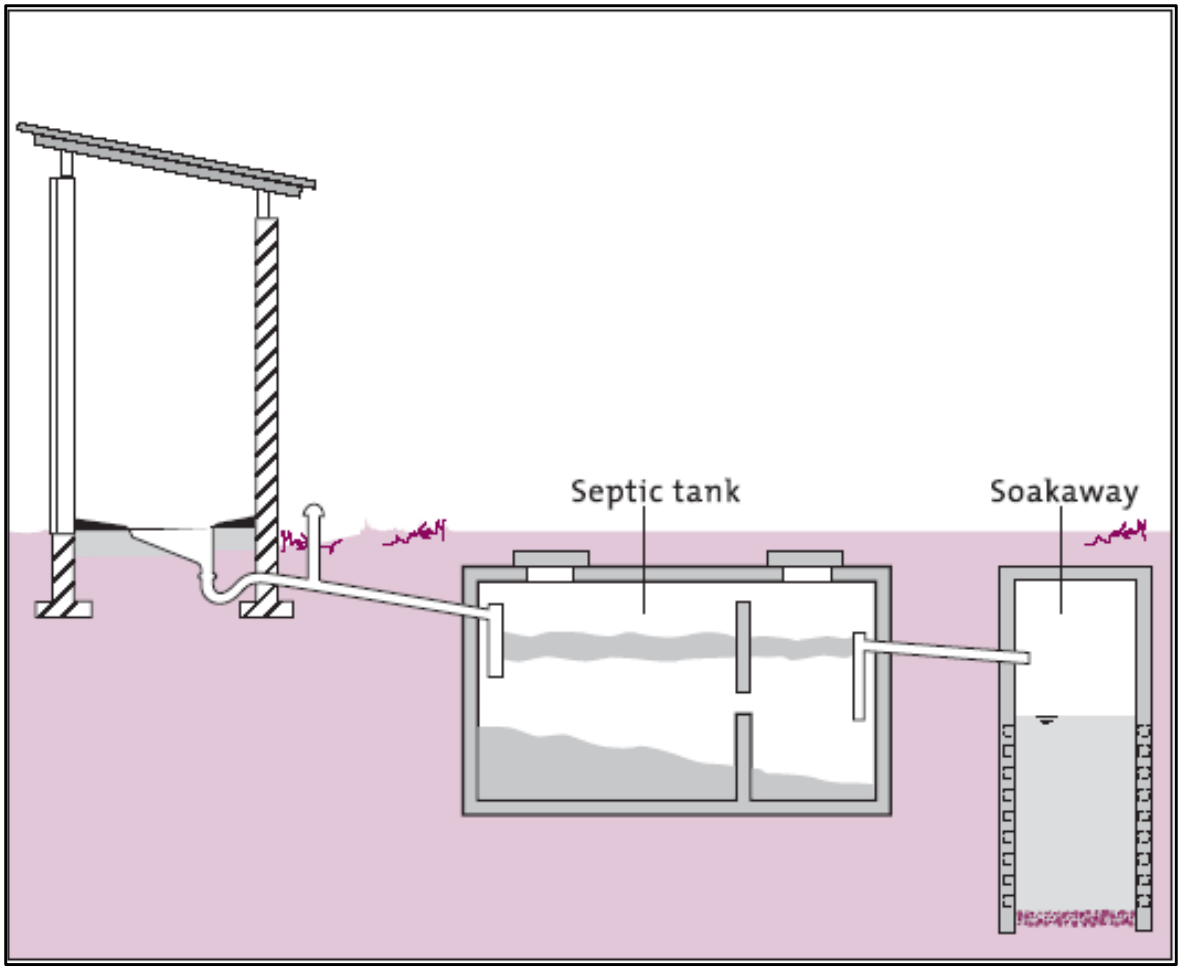


6. Septic tank

A septic tank is an underground watertight settling chamber into which raw sewage is delivered through a pipe from plumbing fixtures inside a house or other building. The sewage is partially treated in the tank by separation of solids to form sludge and scum. Effluent from the tank infiltrates into the ground through drains or a soak pit. The system works well where the soil is permeable and not liable to flooding or water logging, provided the sludge is removed at appropriate intervals to ensure that it does not occupy too great a proportion of the tank capacity

Septic tank



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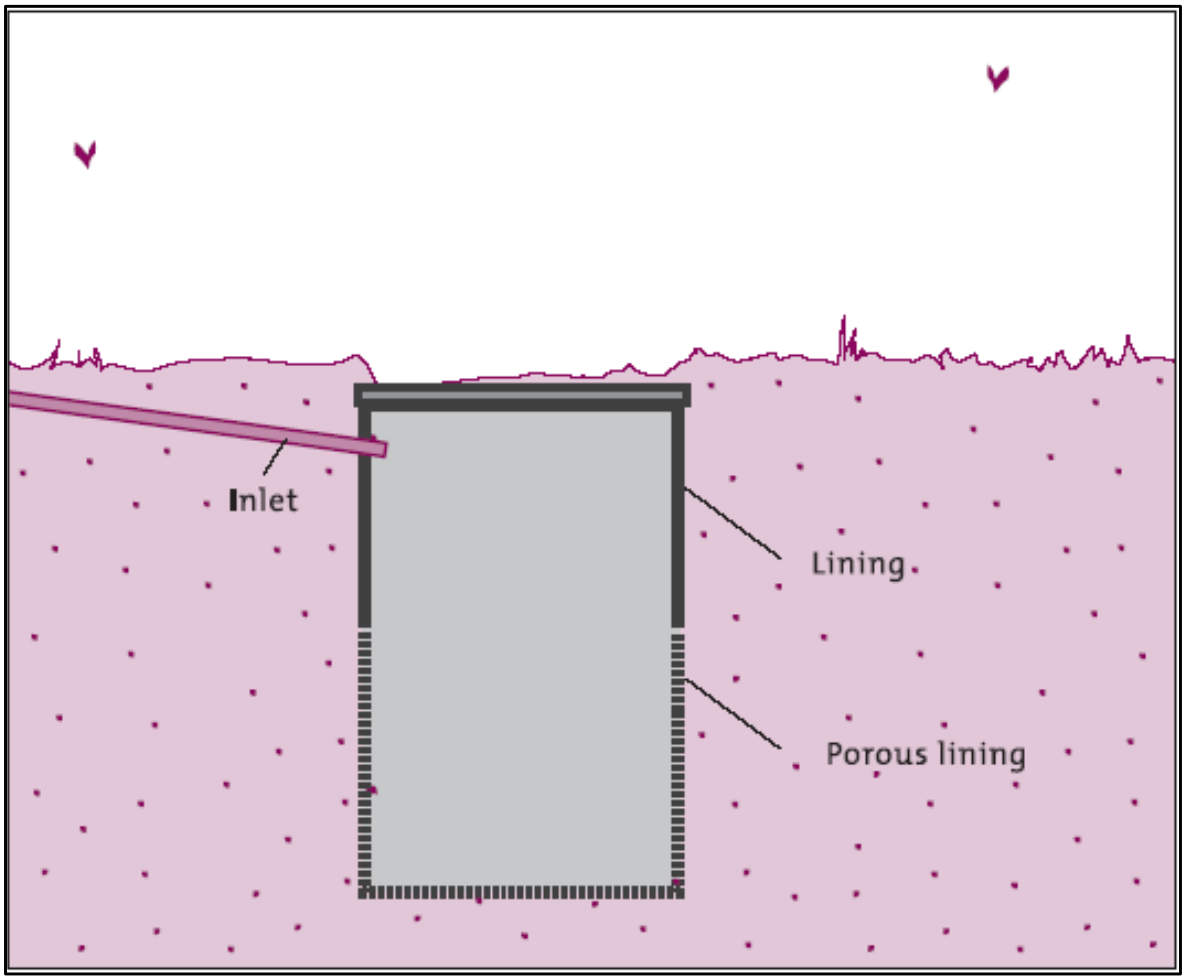
7. Aqua-privy

An aqua-privy has a watertight tank immediately under the latrine floor. Excreta drop directly into the tank through a pipe. The bottom of the pipe is submerged in the liquid in the tank, forming a water seal to prevent escape of flies, mosquitoes and smell. The tank functions like a septic tank. Effluent usually infiltrates into the ground through a soak pit. Accumulated solids (sludge) must be removed regularly. Enough water must be added to compensate for evaporation and leakage losses.

Aqua privy



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8. Bucket latrine

This latrine has a bucket or other container for the retention of faeces (and sometimes urine and anal cleaning material), which is periodically removed for treatment or disposal. Excreta removed in this way are sometimes termed night soil.

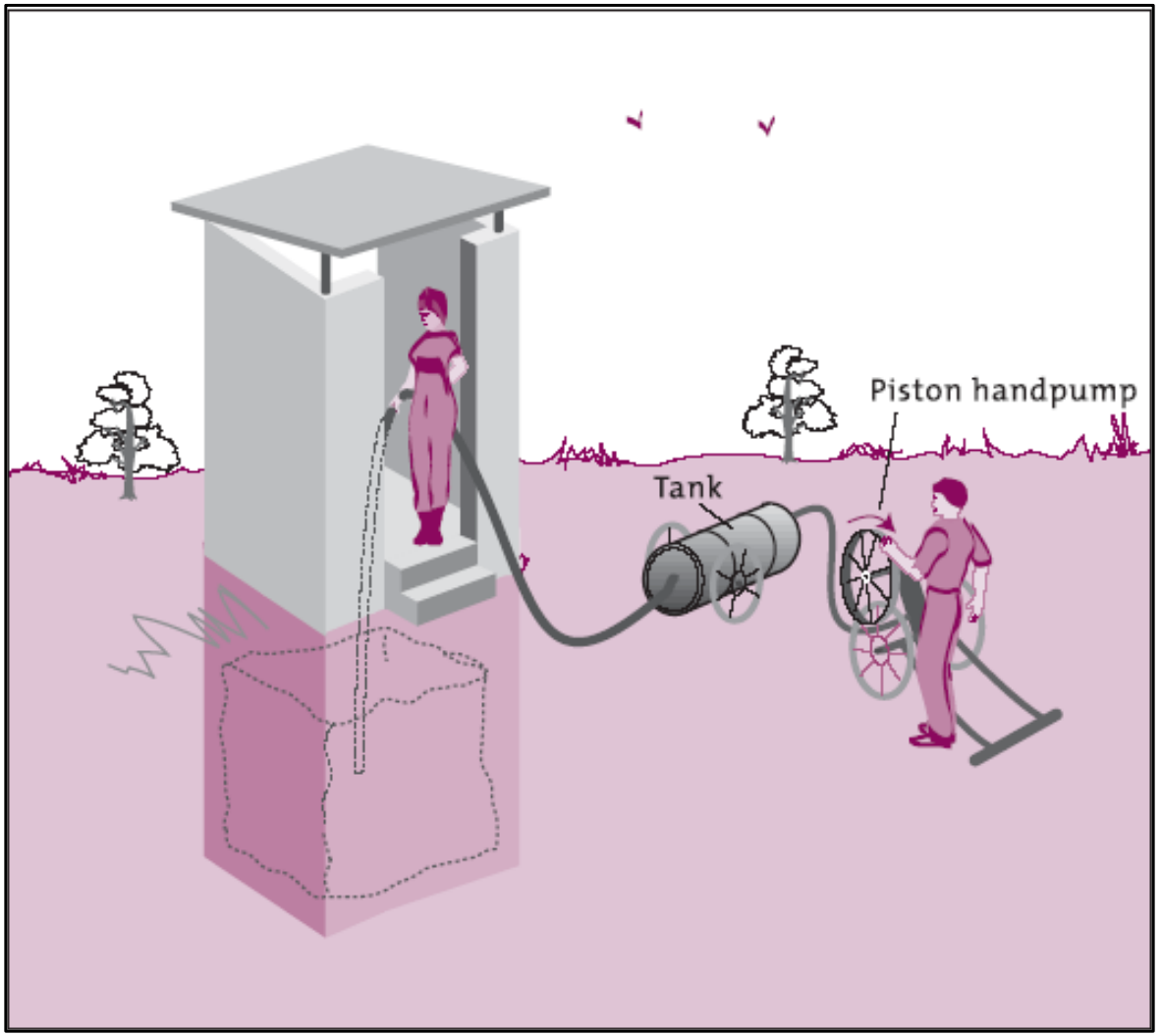
MAPET

- The Manual Pit Emptying Technology (MAPET) uses manually operated equipment to empty the latrine pit.
- Its main components are a piston hand pump and a 200-litre vacuum tank, both mounted on pushcarts, and connected by a 3/4- inch (2-cm) hosepipe.
- A 4-inch (10-cm) hosepipe is used to drain the sludge from the pit.
- When the hand pump wheel is rotated air is sucked out of the vacuum tank, which sucks sludge from the pit through the 4-inch hosepipe and into the tank.

CONT...

- The effective pumping head is 3 m, depending on the viscosity of the sludge.
- The sludge is usually buried in a hole close to the pit, or taken to a nearby disposal point (e.g. a disposal field, or sludge transfer station).
- The equipment is small and hand-operated, and is therefore particularly suitable for high-density settlements with narrow streets, where conventional vacuum tankers have no access.

MAPET



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9. Sewerage

Discharge from WCs and other liquid wastes flow along a system of sewers to treatment works or directly into the sea or a river.

Assignment

- Give the advantages and disadvantages of the above mentioned methods.
- Name the diseases associated with poor excreta disposal.

CONTROL OF VECTORS

- There are a number of insects and animals responsible for spreading some of the common diseases of rural areas

. In addition to pro- tecting water supplies, and improving refuse and excreta disposal, food hygiene, and housing, it is useful to consider what can be done to control the vectors themselves.

- there are also some steps which individuals may take themselves or, better, together with their neighbours or the village community, which can greatly reduce the health hazards involved.

Houseflies

- Flies breed and feed on decaying matter such as vegetable refuse, animal carcases, and particularly on faeces. They carry the bacteria from this decaying matter onto human food, skin, and eyes when they land on them. The village community should be told of the above fly habits before being asked to help control them.

Housefly can be control by:

- (a) All refuse, any decaying matter, carcases, and faecal matter must be properly disposed of by burying, burning, or being properly composted to useful fertilizer.
- (b) All house surroundings must be kept clean all the time.
- (c) All houses must be kept clean, all food leftovers, etc. should be placed in covered dustbins, or buried immediately. (d) All food vessels and utensils should be kept clean.
- (e) Foods should be protected from flies—food and meat safes are recommended for this purpose.

- (f) Village streets, roads and other public areas should be kept clean. This can easily be done by the villagers themselves, providing there is a good organization and proper division of labour amongst them.
- (g) Animal-keeping areas like cattle bomas should be away and separate from human settlements.
- (h) Above all, people should always wash themselves after using the latrine and before and after preparing food and eating.

- ALWAYS WASH HANDS:
- 1. BEFORE PREPARING OR EATING FOOD
- 2. AFTER USING THE LATRINE

Mosquitoes

- Mosquitoes, through transmitting malaria, are the number one killers in rural Africa.
- The nuisance and danger from mosquitoes can be reduced if every villager does his part to fight them by

- (a) (i) draining water holes, ditches, and any accumulation of water in or around the village; or (ii) by filling in holes, ditches, etc., so that water will not accumulate.
- (b) Clearing bush and grass along water banks and in the village as a whole. Mosquitoes only breed in damp places and long grass prevents these from drying out.
- (c) Collecting and disposing of all containers likely to hold water—this includes tins, coconut husks, old motor-car tyres, etc.
- (d) Sleeping and talking rooms should have windows screened with mosquito-proof wire gauze and beds should be pro- vided with mosquito nets.
- (e) Use of mosquito repellant coils immediately prior to sleeping time.
- (f) Use of insecticide in hand sprays

- DESTROY MOSQUITOES' BREEDING SITES

Bilharzia snails

- These help to spread,bilharzia (schistosomiasis) , which affects almost as many people as malaria. They breed and live in ponds, swamps, and slow-flowing streams and rivers. Villagers can help to control them by;

(a) clearing all vegetation along the water-edges to deny the snails shade and food;

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(b) clearing water channels so that water flows faster, thus making snail breeding more difficult;

(c) draining of swamps, water holes, etc., to eliminate breeding sites;

(d) the provision and use of latrines by every villager. Everyone, young and old, must understand the danger of defaecating and urinating in or near water. It is people who infect water with bilharzia;

(e) no bathing or swimming in stagnant water;

(f) if molluscicides are available they may be applied routinely by the villagers if other methods cannot be used.

- IT IS PEOPLE WHO SPREAD BILHARZIA

Rodents

- Rats and mice live and multiply rapidly where there is a low standard of sanitation and where human food is easily accessible
- community should do the following to control this nuisance and health hazard:

Cont…

(a) There must be proper storage, collection, and disposal of all types of rubbish.

(b) All bush and long grass in and around the village should be removed.

(c) Open rodent holes in the village should be sealed with earth or with any other suitable rat-proof material.

Cont...

(e) Raw food like rice, maize, millet, cassava, beans, etc., should be stored in rat-proof stores outside the main building. This can be done by constructing a big hut with a rack supported with wooden poles. The supporting poles can be provided with metal sheet-guards (funnel-shaped) so that rats or mice cannot climb up.

(f) When there is a big population of rodents, villagers can hunt them with sticks, etc.

(g) Break-back or cage traps can also be used.

(h) Pets like cats and dogs also help to control rats and mice

- RATS STAY ONLY WHERE THEY ARE FED

Fleas, bedbugs, lice, and ticks

- All these are a widespread source of nuisance and ill health. They can be controlled by depriving them of sheltered places in which to breed such as unwashed clothing, the joints of roughly made bed frames, and cracks in mud walls and floors; and by reducing contact with animals. The use of soap, sunlight, and cement in these ways is more important than the use of DDT.

Occupational health and safety

- **Occupation** is a word that describes any engagement for which a person gets pay or reward.
- **Health** is not merely the absence of disease or infirmity but also the physical, mental, and social elements affecting health.
- **Safety** implies the absence of conditions which may result in ill health.
- **Occupational health** is a broad discipline that is concerned with health and work.

cont

- Workers are a group for whom special services should be provided for with a variety of reasons;

➢ They may be exposed to special health risks at work place.

➢ They may work in very isolated areas where no other health are available.

➢ There may be many people at one workplace so that it is more economical to health services to them than to make them go to an outside health facility.

OHS(Occupation Health & Safety)

I. Is the ability of a worker to function at an optimum level of well-being at a worksite as reflected in terms of productivity, work attendance, disability compensation claims, and employment longevity.
II. is the discipline concerned with preserving and protecting human and facility resources in the workplace.

In other words, occupational health and safety encompasses the **social, mental and physical well-being of workers**, that is the “whole person”.

Sources of occupational health hazards.

1.Chemical hazards:- are divided into nutritive and non-nutritive substances.

- Non-nutritive chemicals may be categorised into gases, liquids and solids.

➢ **Gases**

- Gases may further be divided into **irritant** and **non-irritants.**
- Gases of the **irritant group** are potent poisons.
- Because they are very irritating and not easy to breathe, workers exposed to them withdraw from the site ;hence cases of poison due to them are rare.

cont

- **Examples** of irritating gases include chlorine, ammonia, and sulphur dioxide.
  - These gases are absorbed by the mucous membranes of the eye and upper respiratory tract.
  - They cause weeping, conjunctivitis, and laryngitis similar to that experienced with tear-gas.
  - These irritants may cause a burning sensation, bad odour or irritation of the throat.
- **Non-irritant** gases are tasteless, odourless compounds which may be quite dangerous. The victim may be overcome without even suspecting danger. Eg carbon monoxide.

cont

- **Liquids**

☐Can have direct local action on the skin and mucous membrane.

☐Others are water soluble or fat soluble compounds which are absorbed through the skin and act as systemic poisons.

☐These liquids include solvents, pesticides such as DDT and the organophosphorous compounds, cyanides and phenol.

☐Those compounds which act on the surface require localised treatment whereas those entering the body will need antidotes.

cont

➢Solids

- Chemicals can also be in solid form e.g dust of substances like asbestos, lead, nickel, aluminium, and its compounds.
- These can poison the body by contact, inhalation, and infection.

Example: inhaling asbestos dust can lead to cancer of the lungs.

Sources of occupational health hazards.

2.Physical hazards

- They include:
- Noise and vibrations
- Radiation
- Light
- Electricity
- Abnormal temperatures.

cont

2. Physical hazards cont'd.....

❑Noise and vibrations:-

- noise is measured in decibels
- Vibrations refer to back- and-forth motion of matter.
- Vibrations which are of interest to occupational health are associated with use of hand-held power tools such as hammers and drills.
- This has been found to cause a condition called dead hand or white fingers(white fingers syndrome).
- It is characterised by numbness, loss of muscular control and reduction of sensitivity to heat, cold & pain.

Radiations:-

is emission of energy in the form of electromagnetic waves or particles charged or uncharged with electricity.

- These rays or particles can be ionising or non-ionising.
- Ionising radiation include X-rays, alpha particles, beta particles and gamma rays.
- Ionising radiation is used in the treatment against cancer and for diagnostic purposes
- Non-ionising radiations include ultraviolet, infra-red, microwave and radio waves. These waves are used in food processing such as in microwave.

Light:-

- Light is that form of radiant energy which produces the sensation of sight.
- The sources are sun, fire, lamps, electric bulbs, and even certain insects and marine organisms.
- Too much or too little light can lead to serious problems at work places.
- Some of these are fatigue, poor vision or psychological problems.
- Fatigue makes workers prone to accidents,

Electricity :-

- Is the energy caused by the flow of current in a conductor(wire).
- It can be generated from water movement or generator which uses fuel.
- Electricity is dangerous and can give electric shock which can cause death or maiming.
- It is therefore important to take necessary precautions.

Abnormal temperatures :-

- Both high and low temperatures can be of an intensity beyond the levels which can be tolerated by the human body.
- A lot of heat make a person tired hence prone to accidents as a result of heat exhaustion.
- Low temperatures will lead to problems such as frost bite, reduced performance, and numbness of extremities eg in fish filleting factories.

Biological hazards

- Come as a result of live or infective agents which cause infection.
- People who work in different occupations are exposed to different problems.
- Those who work in plantation can contract hookworm whereas those in irrigation schemes might contract bilharzia.
- At a slaughterhouse, workers are exposed to brucellosis, anthrax will occur among tanners, hide handlers and leather works.

cont

- Psychological hazards resulting from stress and strain;
- Hazards associated with the non-application of ergonomic principles, for example badly designed machinery, mechanical devices and tools used by workers, improper seating and workstation design, or poorly designed work practices.

Prevention of occupational health hazards.

- **Change:-** replace dangerous production methods with or chemicals with less dangerous ones
- **Separate:-** separate workers from dangerous machinery or poisons
- **Ventilate:-** provision of devices that will allow free circulation of air in the work place.
- **Protect:-** provision of protective garments, provision for workers to wash hands before eating, helmets and safety boots, facemasks.
- **Educate:-** instructing and informing workers about the dangers that exist in the work and work environment.

The role of occupational health nurse

- ✓Identifying, controlling occupational health hazards.
- ✓Advising on safety and protection from disease.
- ✓Assisting at medical examination to determine the worker's suitability for employment and for carrying out routine checks.
- ✓Teaching health education.
- ✓Training workers on first aid
- ✓Making routine checks on safety and welfare

cont

- ✓ Providing first aid treatment on minor ailments, and basic medical care, and referring cases of serious illness.
- ✓ Recording and reporting occupational injury and disease.
- ✓ Offering counselling and support to workers.
- ✓ Advising on any epidemic outbreak of illness and investigating the case.
- ✓ Inspecting canteens, kitchens and sanitation.

cont

- ✓Assisting those who are sick, handicapped or disabled, especially in rehabilitation and readjustment to work.
- ✓Caring for workers families in – antenatal care, running child welfare clinic, immunizations.
- ✓Visiting workers with long-term illness.
- ✓Liaising with management on all matters concerning the health and safety and welfare of workers.

Terminology

- The terminology used in OSH varies between states, but generally speaking:
- A hazard is something that can cause harm
- A risk is the probability of the hazard causing harm
- The outcome is the result of when the hazard causes harm

Risk Assessment

- Modern occupational safety and health legislation usually demands that a risk assessment be carried out prior to making an intervention. This assessment should:

➢ Identify the hazards

➢ Identify all affected by the hazard and how

➢ Evaluate the risk

➢ Identify and prioritize the required actions

➢ The assessment should be recorded and reviewed periodically and whenever there is a significant change to work practices.

Why is occupational health and safety important?

Work plays a central role in people's lives, since most workers spend at least eight hours a day in the workplace, whether it is on a plantation, in an office, factory, etc. Therefore, work environments should be safe and healthy. Yet this is not the case for many workers. Every day workers all over the world are faced with a multitude of health hazards, such as:

- Dusts;
- Gases;
- Noise;
- Vibration;
- Extreme temperatures.

OH associated diseases

- Some occupational diseases have been recognized for many years, and affect workers in different ways depending on the nature of the hazard, the route of exposure, the dose, etc. Some well known occupational diseases include:
- Asbestosis (caused by asbestos, which is common in insulation, automobile brake linings, etc.);
- Silicosis (caused by silica, which is common in mining, sandblasting, etc.);

Cont..

- lead poisoning (caused by lead, which is common in battery plants, paint factories, etc.);
- Noise-induced hearing loss (caused by noise, which is common in many workplaces, including airports, and workplaces where noisy machines, such as presses or drills, etc. are used).

Problems associated with poor working condition

There are also a number of potentially crippling health problems that can be associated with poor working conditions, including:

- Heart disease;
- Musculoskeletal disorders such as permanent back injuries or muscle disorders;
- Allergies;
- Reproductive problems;
- Stress-related disorders.

Points to remember about the extent of the problem worldwide.

- There are at least 250 million occupational accidents every year worldwide, at least 335,000 of which result in death.
- Developing countries have more fatal accidents than industrialized nations, emphasizing the need for health and safety education programmes that focus on prevention.
- Some occupational diseases have been recognized for many years and affect workers in different ways. Such diseases are still problems in all parts of the world.

Cont..

- The numbers of work-related diseases in developing countries are much higher in reality than the numbers that are reported.
- The numbers of cases and types of occupational diseases are increasing in both developing and industrialized countries.
- It is often difficult to identify the cause of both occupational accidents and diseases.

Types of hazards

- Chemical hazards, arising from liquids, solids, dusts, fumes, vapours and gases;
- Physical hazards, such as noise, vibration, unsatisfactory lighting, radiation and extreme temperatures;
- Biological hazards, such as bacteria, viruses, infectious waste and infestations;

Roles of ohs nurse

a) Primary prevention
b) Emergency
c) Treatment services – within work place
d) Nursing diagnosis – assessing clients health care needs & formulating appropriate nursing care plans
e) Specialist – occupational health policy ,and practice development, implementation and evaluation i.e. involved with senior mnx in developing the workplace health policy and strategy

Cont,,

f) Occupational health assessment – plays a role in health assessment for fitness, periodic health examinations & individual health assessment for lifestyle risk factors.

g) Health surveillance – undertake routine surveillance procedures, periodic health assessment and evaluating results from screening process.

h) Sickness absence mnx – helping managers to mnx sickness absence more effectively.

i) Rehabilitation – key person in rehabilitation programmes.

Cont…

j) Maintenance of work ability – develop pro-active strategies to help workforce maintain or restore their work ability.
k) Hazard identification – always close with workers
l) Risk assessment – uses risk management approach
m) Advice on control strategies – hazard identification and risk mnx.
n) Research and the use of evidence based practice – utilize research findings from wide range of discipline (nursing,toxicology,environmental and public health)

Food Safety Regulations

- The safety of food is so important that our government has passed laws to protect the public. These laws cover many aspects of food handling and health officers are generally responsible for enforcing these laws. Agricultural personnel assist them, where necessary.
- You will look at some of the factors that should be considered when preparing or handling food and some of the food-borne diseases.

- ***Remember:***
  The Public Health Act Cap 242 is an Act of Parliament to make provision for securing and maintaining health. This act is divided into 15 parts. Each part deals with a specific aspect of public health.

- Part 10 of the Act deals 'with protection of foodstuffs'. This part regulates the construction of buildings used for storage of foodstuffs. Secondly, it prohibits residing or sleeping in kitchens or food stores

- Part (II) deals with 'milk, meat and other articles of food'. This part prohibits the sale of unwholesome foods. It gives powers to authorised officers to inspect and examine food, seize and recommend disposal at any time
- . These laws aim at protecting the public and the public health officers are responsible for enforcing them. As a community health nurse you need to work closely with public health officers to apply the food safety regulations.

Personal assignment

- Definition of pollution
- Types of pollution
- How to prevent pollution
- Disease associated to pollution

pollution

- Def; is the spoiling of natural resources and water by contamination with harmful substances.

Types of pollution

- Water pollution
- Air pollution
- Land pollution
- Noise pollution
- Light pollution

Water pollution

- It is the addition of substances that changes the natural quality of water
- It can occur through:
- Sewage which contains decomposable organic agents
- Industrial trade and wastes which contains toxic agents ranging from metal and salts e.g effluents from pulp paper textile and sugar industries
- Agricultural pollutants which comprise fertilizers and pesticides
- Physical pollutants which include heat and radioactive substances

Prevention of water pollution

- Sewage treatment
- Treatment of waste before discharge
- Treatment of drainage water
- Strict adherence to water laws
- Ensuring that big cities have water treatment plants
- Keeping pond water clean and safe
- Maintaining self hygiene
- Improving sanitation system
- Common public should be aware of the effects of water pollution

Diseases associated with water pollution

- Cholera
- Amoebiasis
- Dysentry
- Diarhoea
- Hepatitis A
- Lead poisoning

Air pollution

- The presence in the ambient atmosphere of substances generated by the activities of man in concentrations that interfere with human health safety or injuries to vegetation and animals and other environmental media.
- Examples are;
- Automobiles which emit hydrocarbons, carbonmonoxide, lead and particulate matter industries which emit large amoumts of pollutants into the atmosphere through smoke

prevention

- Automobiles should be properly maintained
- Better designed equpmepment and smokeless fuels shold be used in homes and industries
- Use of fabric filters

Diseases associated

- CHF
- Asthma
- Preterm babies
- Emphysema

Land pollution

- This is caused by careless disposal of carbage and trash especially in big cities

prevention

- Recycling of wastes
- Use of pollution free incinerators
- Good ventilation to avoid the effect of radiation
- Diseases associated
- Lung cancer due to radium disintegration
- Diarrhea due to garbage decomposition

Noise pollution

- Un desirable level of noise caused by human activity that disrupt the starndard of living in the affected area
- This encompases
- roadway noise
- aircraft noise
- ,industrial noise
- concets
- Thunderstoms
- Churches
- Clubs schools

- **Prevention**
- Wear ear protection
- **Diseases associated**
- Stress
- Loss of hearing

Radioactive pollution

- Rare and extremely detrimental when it occurs because of its intensity and difficulty of reversing climate.

Sources of radioactive pollution

- Nuclear power plant accident and leakage
- Improper nuclear waste disposal like from uranium
- Mining of nuclear minerals like uranium mining operation
- Nuclear weapons and warheads emitting radioactive
- Improper x-ray services from hospitals emitting radioactive materials

Thermal pollution

- This is excess heat that creates undesirable effects or outcomes over long periods of time
- Causes
- Flower plants such as greenhouses for flower farms
- Urbanization that is sprawling of houses hence causing high heat due to minimal trees
- Air pollution particles such as from factories
- A forestation and deforestation hence trees are destroyed causing global warming leading to thermal pollution
- Desertification also causes thermal pollution

Light pollution

- This is over –illumination at an area that is considered obstructive.
- Sources of light pollution
- Large cities
- Billboards erections
- Stadium or stadia lights
- Street lighting

Summary of preventive measures

- Make sustainable transportation choices –use of well or road worthy vehicles with good engiene so as to prevent emmision of gases into the air
- Make sustainable food choices-learn to purchase food that are easily available and one that are highly consumable, since too much of tyhem leads to wastage and also avoid buying of canned food

Cont…

- Make sustainable energy sources
- Turn off lights and electronics when not in use
- Recycle reusable items
- Keep chemicals out of water supply
- Use few chemicals when spraying crops
- Get involved and learn to educate others.