

Outline is the topics outcomes. These outcomes are expected by students to achieve. The text book has all the information that is needed for the students to read and complete the questions. Please take time to read through so you have a fair idea as to what is expected from you as a student in order to complete this topic. The outcomes are also part of the prescription which is used to assess students during the end of year exams. By completing this topic with reference to the outcomes students should be in a better position to do well in this topic. The questions you need to do are marked and you need to do only these questions at this time.

OUTCOMES:**SECTION A: Micro-organisms and Diseases (4 HOURS)**

Topic: Some locally important diseases as examples of different causative agents and means of transmission including measles, polio, tuberculosis, tetanus, whooping cough, malaria, ringworm, hookworm, and lice.

HH1: etc.); also describe its usual means of transmission: measles, polio, State, for each of the following diseases, at least two important characteristics of the disease and the nature of the causative agent (virus, bacterium, fungus tuberculosis, tetanus, whooping cough, malaria, ringworm, hook worm, lice; (k1.1)

SECTION B: The Body's Natural Defenses (3 HOURS)

Topic: the body's defenses against infection; the role of the skin and the clotting of blood, the role of the whole cells in ingesting bacteria, antibodies, natural and acquired immunity.

HH2: Discuss the importance of the skin and the clotting of blood that helps to protect the body by preventing the entry of disease organisms; (K2.1)

HH3: Explain how some white blood cells in the blood can leave the capillaries and can ingest bacteria; also that this can lead to the formation of pus at the infected site; (K2.1)

HH4: Explain what is meant by "natural immunity" and "acquired immunity" referring to the role of "antibodies" and use these terms appropriately; (U1.2)

SECTION C: The Prevention and Cure of Disease (4 HOURS)

Topic: the prevention of disease: Vaccination (theory of vaccination, child vaccination practices in Vanuatu, vaccination for overseas visits, epidemics). – The importance of consulting a doctor when a person shows serious symptoms, the curing of disease; serums, antibiotics, medicines, importance of completing a course of treatment.

HH5: State the difference between preventing and curing a disease and of the importance of preventative medicine; (U2.1)

HH10: Simply explain the principle of vaccination; (U2.1)

HH12: Interpret a standard "immunization schedule" card; (U1.2)

HH13: State the importance and need for vaccination for overseas visits and during epidemics; (U2.1)

HH19: State the importance of identifying early symptoms of an illness for which doctor's advice is necessary; (K1.1)

HH20: Discuss how 'serums' containing antibodies for a particular disease may be obtained from the blood of animals; also know that a serum is often used possible cases of tetanus; (K1.1, K2.2)

HH21: Explain how antibodies and some medicines kill disease organisms, whilst other medicines simply relieve symptoms while the natural defenses of the body kill the organism; (K2.1)

HH22: Explain the importance of completing a prescribed course of treatment; (U2.2)

What is AIDS?

SECTION D: Healthy Living (5 HOURS)

Topics: the preventive of disease; maintaining a healthy body with good resistance to disease (nutritional habits, exercise, smoking and 'drinking'), hygiene (personal, food, water, environmental).... – some particular diseases; dental caries and its prevention; STD's as avoidable diseases endangering life, general health and fertility.

HH6: State the importance of general health and resistance to disease of: a balanced diet, moderate mental and physical activity. Cleanliness; (U2.1)

HH7: Discuss the negative effects of general health and resistance to disease of: irregular feeding habits and/ or an unbalanced diet; polluted air, smoking; indolence; uncleanness; (U2.1)

HH8: State the importance of hygiene in respect of (1) oneself, (2) food (3), domestic water and, (4) the environment; (U2.2)

HH9: Describe and explain practical steps that can be taken to achieve reasonable standards of hygiene in each of the four categories enumerated in objective HH8 above, in both urban and rural settings; (U2.2)

HH14: Explain the formation of plaque and how this is associated with the decay of teeth; (K2.1)

HH15: Describe and explain the formation of plaque and how this is associated with the decay of teeth; (K2.1)

HH16: Explain how certain disease, called STD's, are transmitted during sexual intercourse and that these diseases can normally be acquired except sexual intercourse with a person who already has the disease; (U1.2)

HH17: Discuss how AID's is a fatal STD which is caused by the HIV virus, and describe the course of the disease referring to (1) the means by which the virus is and is not transmitted, (2) its effect on the immune system, (3) latency, and (4) the subsequent development of symptoms; (K1.1, U1.1)

HH18: Explain how other serious STD's can be successfully treated but that, if not treated, they may affect general health, fertility and the health of any children born to a person suffering from the disease; (K2.1)

SECTION D1: OPTIONAL (NON-EAMINABLE) Aids Awareness (1 HOUR)

AA1. State the AID's is a disease caused by a virus (known as HIV);

Why is it important?

AA2. State that AIDS kills most people who develop the symptoms of the disease within two years;

AA3. State that AIDS mainly affects the 15-40 year old age group because they are sexually active;

AA4. State that there is no medicine which can cure AIDS;

AA5. Define and understand what is meant by an "AIDS carrier";

AA6. State the period for which a person is infectious;

AA7. Describe the effect of AIDS on the immune system;

AA8. Describe the 2 stages of the disease; (1) latency, (2) development of symptoms;

AA9. Explain why you cannot tell if someone has the disease by looking at them;

AA10. Describe the uses and limitations of the blood test for AIDS;

How do you catch AIDS?

AA11. Describe 3 ways in which the AIDS virus is spread;

AA12. Describe 5 ways in which the AIDS virus is not transmitted;

AA13. Identify a list ways in which AIDS virus is not transmitted;

AA13. Identify in a list ways in which AIDS can and cannot be caught;

How can you prevent the spread of AIDS?

AA14. Describe the 2 ways of preventing the spread of AIDS by sexual contact;

AA15. Describe the 2 ways of preventing the spread of AIDS by blood contact;

AA16. List 3 behaviors which put people 'at risk' for catching AIDS;

AA17. Explain why it is safe for someone with AIDS to live in the community;

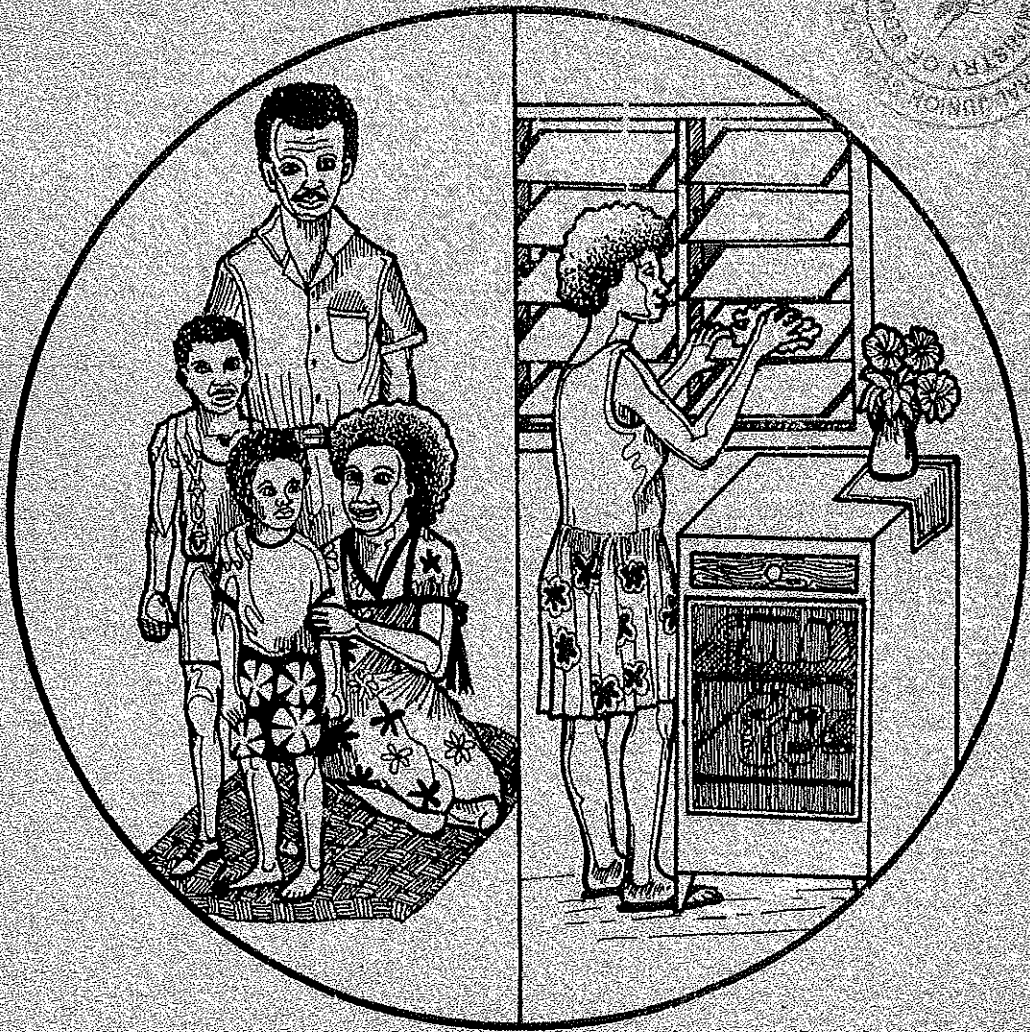
AA13. Describe the treatment for someone with AIDS in the community.

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BASIC SCIENCE

STUDENT'S BOOK
YEAR 10

HEALTH AND HYGIENE

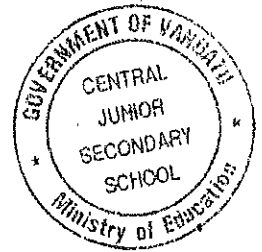


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BASIC SCIENCE

Year 10 Student's Book

HEALTH AND HYGIENE



Ministry of Education
Port Vila
Republic of Vanuatu
1997

Revised Edition 1997

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Revised by David Slimming

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CHAPTER 1

DISEASES AND PREVENTION

1.1 CAUSATIVE AGENTS

The study of health and hygiene is a continuation of your study of the human body in Year 9. You have learned how the systems of the body work, how they depend on each other, and how each system helps meet the needs of the body. In the section on nutrition, you learned the importance of eating the right kinds of foods to avoid the diseases of malnutrition. The term **disease** is used to describe the poor health of a body. Sometimes this is caused by a poor diet which lacks the proper foods. Most diseases, however, are caused by very tiny living things in our environment. We will begin by studying some of these **micro-organisms**.

In the world around us, in the air we breathe, and in the water we drink, there are thousands of micro-organisms: viruses, bacteria, protozoa and fungi. For example, millions of bacteria live on our skin and even inside our bodies.

ACTIVITY 1 MICRO-ORGANISMS

You will need: • 5 agar plates, tap water

1. Take 5 agar plates. Carefully lift the lid off one. Put about 10 drops of water on it. Spread it around by tilting the plate. Do not touch the agar. Replace the lid as quickly as possible. Label this plate **Water**.
2. Take another plate. Take off the lid and leave it open for 5 minutes. Replace the lid. Label this plate **Air**.
3. On the next plate, wipe your finger over the surface of the agar. Some groups could use a comb or a few strands of hair from a student's head. Replace the lid. Label this plate **Finger** (or **Comb** or **Hair**).
4. If someone in your class has a cough or cold, get them to cough or sneeze onto the plate (**Cough**).
5. Keep one plate which has not been opened. Label this one **Control**.
6. Leave all the plates upside down overnight. Next day, examine the plates without opening them. Examine them again after 2

days and after 3 days. "Colonies" of micro-organisms should be seen growing on most of the plates. They look like discoloured patches on the plates:

7. Report and interpret what you observe. (Round patches growing on the agar are "colonies" of bacteria or fungi.)

ACTIVITY 2 MOULD AND FUNGI

You will need:

- mould and fungi growing on bread and fruit
- hand lens
- spatula
- microscope and slides

1. Examine the moulds and fungi growing on bread or fruit with a hand lens. With a spatula, transfer tiny scraps of the moulds and fungi onto microscope slides. Examine these under low or medium power (x40 and x100). Draw what you see.

ACTIVITY 3 MICRO-ORGANISMS IN WATER

You will need:

- stagnant water which has been in a pond or puddle for several days
- dropper
- microscope and slides

(If no stagnant water is available, then muddy water can be mixed with dry grass in a bottle and left for 3 or 4 days)

1. Place one drop of water on a microscope slide. Examine the water under medium power (x100). Try to find some protozoa (small moving creatures). Draw any examples you find.

The results of these activities should convince you that there are millions of micro-organisms all around us. Many of these are bacteria. Some are harmless, some are dangerous because they can cause disease or infection, and some are very useful! There is a bacterium which lives inside your intestines which helps you to digest your food. It is called *Escherichia coli*. Some bacteria decompose dead animals and plants and play a very important role in re-cycling certain elements in our environment.

Questions:

Q1. What is meant by the word "micro-organism"? Name four different kinds of micro-organisms.

Q2. Look at your agar plates after 1, 2 and 3 days. Make a table in your notebook like the one following. Write down how many colonies

of bacteria or fungi you can see on each of the plates.

Number of colonies

| Agar plate | Day 1 | Day 2 | Day 3 |
|------------|-------|-------|-------|
| Water | | | |
| Air | | | |
| Finger | | | |
| Cough | | | |
| Control | | | |

Q3. What can you conclude about the presence of bacteria and fungi in the environment? Try to explain why the control is important.

Q4. If there are so many bacteria and fungi all around us, in the water we drink and on our food, why are we not sick all the time?

What makes people get sick?

Bacteria, protozoans, viruses and fungi are the four main kinds of micro-organism that cause disease. The common names for all of them are **microbes** or **germs**. As we have seen, most microbes do not cause disease. The ones that do so are called **pathogens**. They cause diseases when they get into or onto our bodies. It does not take a large number to **infect** us with a disease. Even a small number can reproduce very quickly and make us sick. The **symptoms** of disease are the signs that tell us we are sick; for example, a sore throat, a headache, a fever, or a swelling. These symptoms are caused by the damage that the microbes do to our cells. They may get inside a cell and destroy it, or they may make poisonous substances that are harmful to us. The poisonous substances that some pathogens produce are called **toxins**.

Here are some details about each of the four main types of microbes.

1. **Bacteria:** These are single celled organisms and do not have a nucleus like other cells you have studied. They have many different shapes and live in a large variety of habitats. They are found everywhere but can only be seen using a powerful microscope; between 20 and 1000 bacteria would fit on a full stop! (When you looked at the bacteria in the practical exercise you were looking at thousands or millions of the bacteria growing together in a colony.) Bacteria are so light they can float easily in the air.

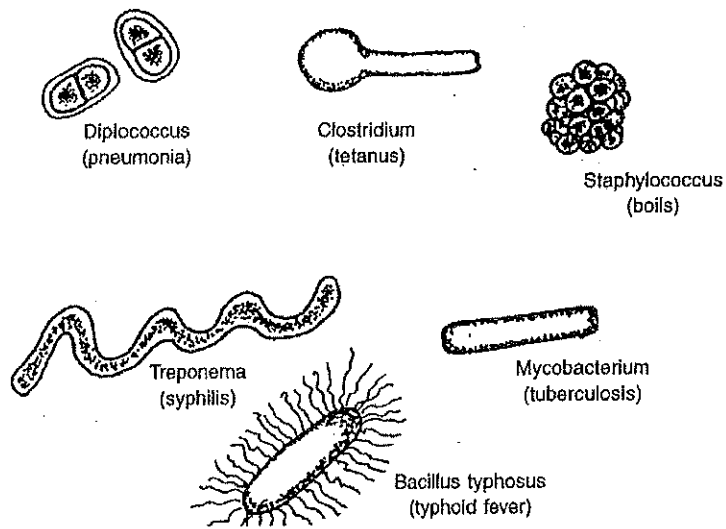


Figure 1. Some different types of disease bacteria

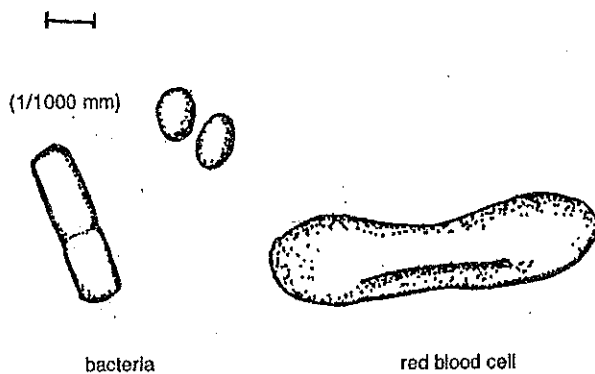


Figure 2. A red blood cell and some bacteria to compare sizes

2. Viruses: These organisms are even smaller than bacteria and a very special microscope is needed to see them. About 200 to 100,000 viruses could fit on a full stop. Viruses do not even have a cell wall but just a coating of protein around them. There are many different types of viruses with many different shapes. Some of these are shown in Figure 3. Viruses are all parasites and some even infect bacteria! They must get inside a cell in order to reproduce. When they get inside a cell, they "take over" and make it work for them instead of letting it do its normal job. The cell is turned into a "virus factory" so that it produces millions of copies of the virus. The infected cell is usually damaged or destroyed. Viruses can only grow and breed in living tissue, and most cannot live outside cells for very long. Sometimes they will go inside a cell and just stay there without reproducing for a long time. Much later the virus may become active and produce disease.

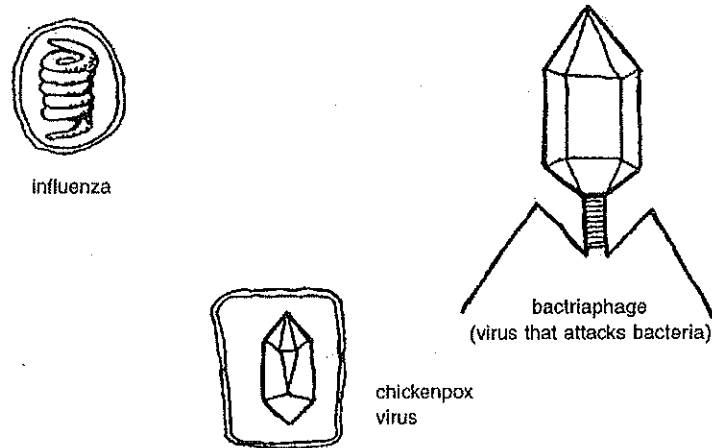


Figure 3. Some disease viruses

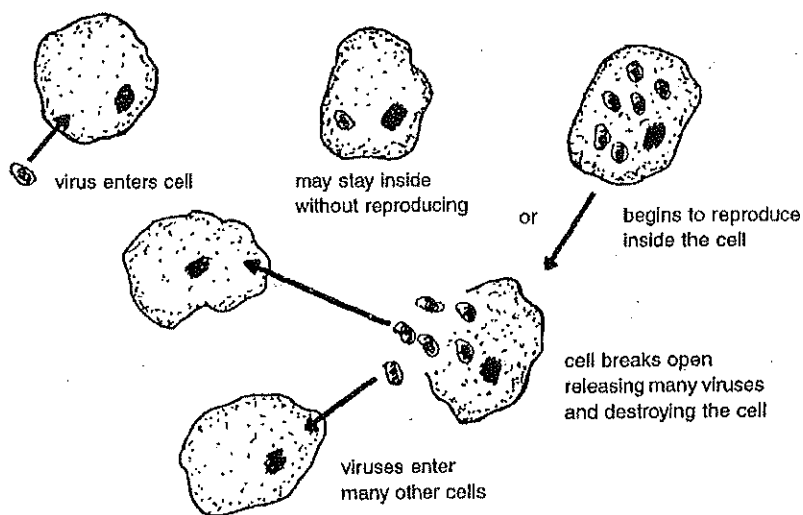


Figure 4. How viruses infect cells

3. Protozoans: These are small single celled organisms like animals. They have a nucleus and cell membrane. They are larger than bacteria and the largest can actually be seen as a small speck with the naked eye. They are still called microbes because a microscope is needed to see them clearly. They are more common in tropical countries (like those of the South Pacific) than in colder countries. Many are harmless, but some are pathogenic and cause serious disease. Malaria is caused by a **protozoan**. Protozoans live in damp soil, in water, or inside other organisms. They have many different shapes and vary in size from about 0.1mm to 2mm.

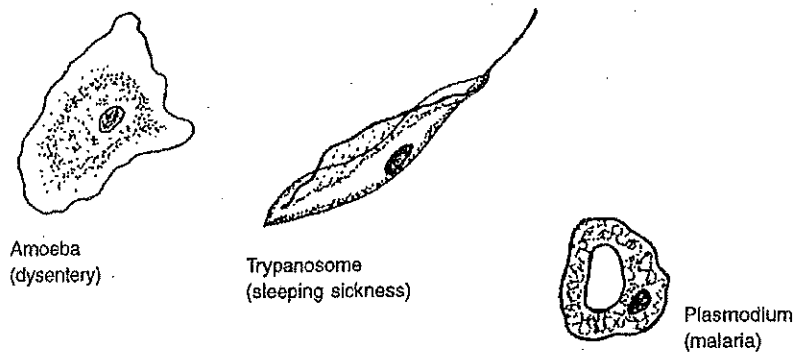


Figure 5. Some examples of disease protozoans

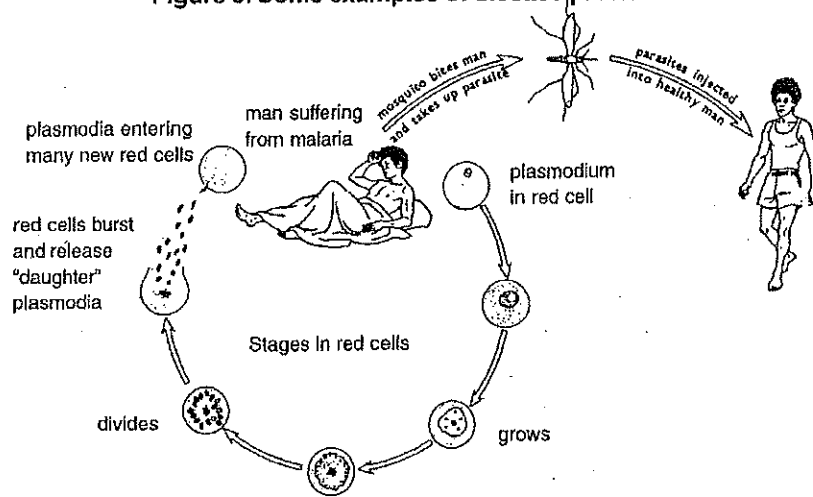


Figure 6. Life cycle of the protozoan which causes malaria

4. Fungus: These are simple, plant-like organisms like the mould that grows on bread or fruit. Many are familiar to you because some are large enough to see. Mushrooms and toadstools are fungi (this is the plural for fungus). There are microscopic fungi too. Some of these are commonly found in your home; for example, the yeasts used in making bread and beer are fungi. Like bacteria, fungi are important decomposers in the food cycle. Most fungi are harmless to man; they cause more diseases in plants than in people. A few, however, cause human diseases such as *ringworm* and *thrush*. Like bacteria, viruses, and protozoans, fungi come in many different shapes and sizes. They can be as small as 0.02mm or as large as 50cm.

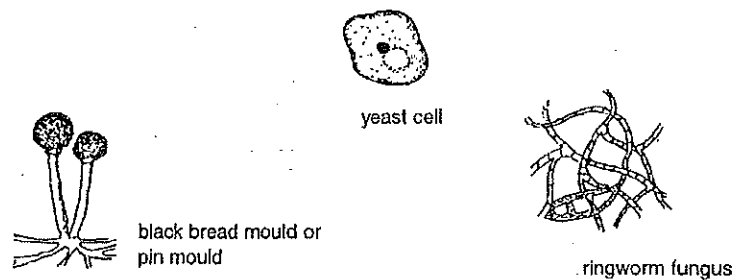


Figure 7. Some fungi

ACTIVITY 4

LOOKING AT YEAST

You will need:

- a little yeast
- warm water with a little sugar added
- beaker full of hot water
- microscope, slides and dropper

1. *Put a little yeast on a watch glass.*
2. *Add enough warm sugar-water to make a thin paste.*
3. *Place the watch glass on top of the beaker of hot water to keep the yeast warm.*
4. *Wait about 30 minutes, then use a dropper to place a drop of the yeast on a slide. Examine your slide under a microscope.*
5. *Draw the yeast cells.*

There is one more group of organisms which can cause diseases. These are the **parasites**. Parasites are larger organisms that live on or in your body and get their food from it. The host (you!) provides food and shelter for the parasite and your body can be damaged by them. These animals do not usually kill the host because then they would lose their home. They may make you sick themselves, or they may carry more serious disease organisms into your body. Some examples of parasites that are common in Vanuatu are the head louse, scabies mite, and hookworm. The hookworm feeds in your digestive system, while the mite and louse suck blood from your skin. Another very important parasite is the mosquito which sucks blood through your skin. However, the biggest danger caused by mosquitoes is the other disease organisms that they carry: the protozoa that cause malaria and the virus that can give you dengue fever.

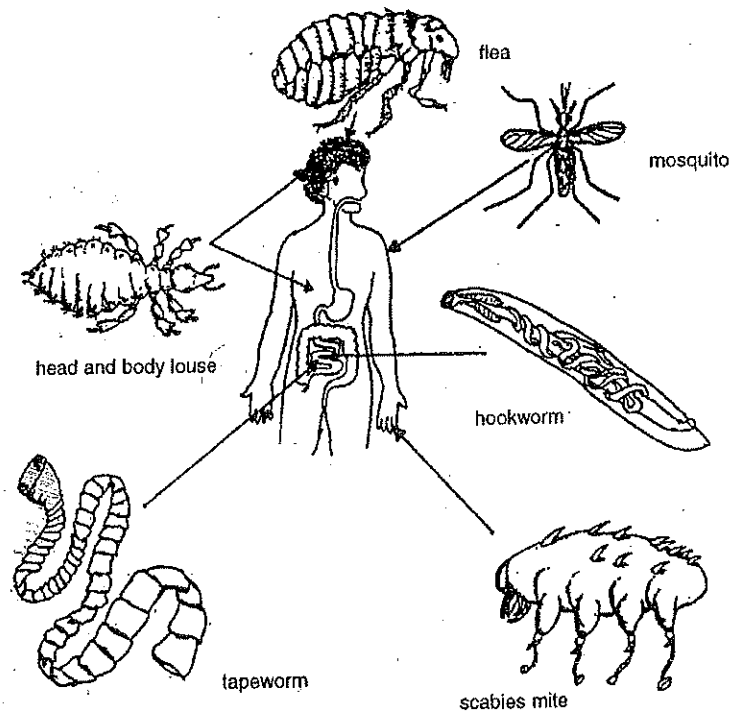


Figure 8 . Examples of parasites which cause or carry diseases

Questions:

- * Q1. Match the following terms with the proper description:
symptom, toxin, disease, bacteria, fungus, protozoan, microbe, pathogen
- organism that can only be seen with a microscope
 - poisonous substance produced by some bacteria
 - a simple, plant-like organism that lives on decomposing materials
 - means poor health
 - an organism that causes disease
 - a simple, single-celled organism that can move like an animal
 - outward signs of disease
 - a single celled organism without a nucleus
- * Q2. What are the differences between bacteria and viruses?
- * Q3. How are bacteria and fungi alike?
- * Q4. Which of the four main agents of disease cause the following?
- malaria
 - tetanus
 - boils
 - influenza (flu)

1.2 THE TRANSMISSION OF DISEASE: How do we get sick?

You have learned that pathogens are organisms which can cause disease. They damage your body by reproducing in large numbers. They may damage the cells or produce toxins (poisons). The way in which a pathogen is carried to your body is called its method of **transmission**. Some methods of transmission are very simple, while other pathogens need special ways to be transferred. A disease that is passed on from one person to another is called an **infectious disease**. Infectious diseases can be transmitted from one person to another in many ways. However, some diseases are not transferred by people, and use different ways to infect us. The main ways in which diseases can be transmitted are:

1. In the air: Transmission of pathogens in the air from people that are infected, to those who are not, can often occur through **coughing, sneezing and spitting**. Coughing, sneezing and spitting (and even breathing and talking), send small drops of water into the air. These droplets can carry disease organisms. When they settle on food, clothes, or other objects, the water evaporates and any bacteria or viruses stay behind. These are then taken in by another person who may now get the disease. Sometimes the pathogens are left floating in the air and can be breathed in directly. This is an easy way for diseases to spread in crowded places like schools or meetings. This type of transmission is called **droplet infection**. Examples of diseases caused by droplet infection are colds, "flu", whooping cough and, most seriously, tuberculosis (TB).



Figure 9. Some methods which spread disease by droplet infection

2. In water: Many disease organisms are transmitted by polluted (contaminated) water. If disease organisms get into drinking water, many people can become infected very quickly. This is a special problem after earthquakes and cyclones where water supplies may become contaminated with sewage (especially human waste). Most of the diseases spread by contaminated water affect the digestive system. Examples caused by bacteria are: typhoid, dysentery, and cholera. Hookworm, a parasite which lives

in the small intestines where it sucks blood, can also be transmitted by water, and so can the virus which causes the serious disease polio.

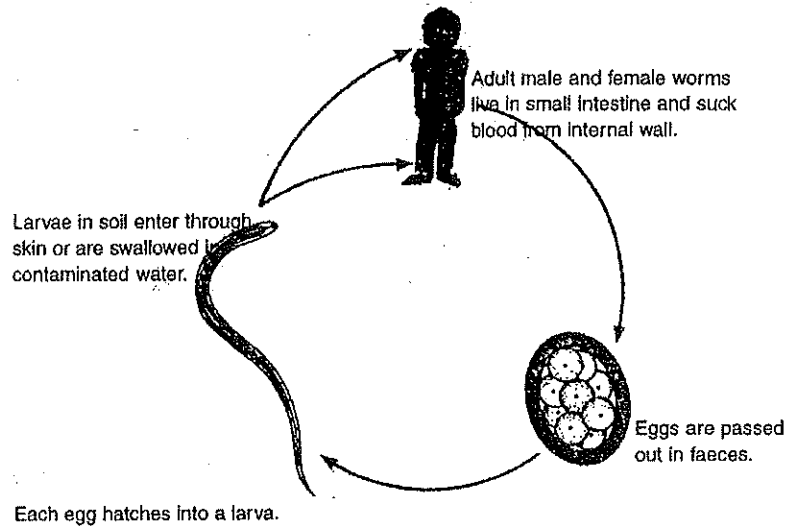


Figure 10. Life cycle of the hookworm

3. **In food:** Many of the same diseases that are carried in water can be transmitted in food that has been handled by someone who has the disease. If they have not washed their hands, they may put some of the pathogens onto the food. The food is then eaten by someone else and the pathogen enters their system. **Carriers** are people who may have a disease, but may not feel sick or have any symptoms themselves. These people can pass pathogens on to others in food, or by contact with them. This happens with diseases like typhoid and food poisoning which are caused by a bacterium called *Salmonella*.

Many bacteria grow quickly in warm food that is left out for too long. Although the food may smell and look good, it can cause disease. The bacteria may come from infected sores that have been touched, or from small traces of faeces left on the hands after using the toilet. Another way is for flies to land on infected sores or faeces, and afterwards to land on food, transferring many bacteria on their legs and mouth parts. Typhoid and dysentery are two of the diseases that can be transmitted by flies in this way. Intestinal worms may also be passed to others by people eating food that has been contaminated by dirty hands.

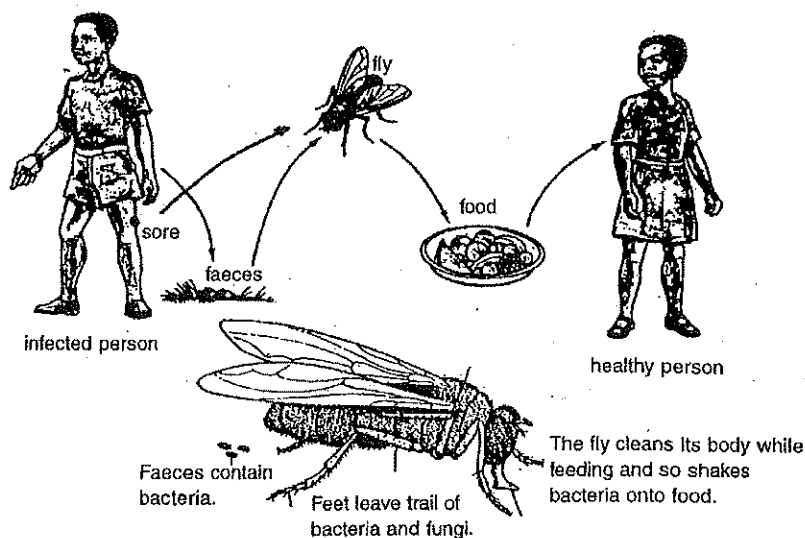


Figure 11. Spread of disease organisms by a house fly

4. By contact: This means actually touching the person or objects handled by them. Fungal infections like ringworm are transmitted in this way, from skin to skin or by infected clothes, towels or bedding. Yaws and smallpox are other diseases transmitted by contact. A common disease in Vanuatu that is spread by contact is red eye. Using the towel or cloth of someone with red eye, or sleeping on his pillow, can transmit the disease to you. Washing your hands, and using your own things, will help you to avoid this and other diseases when many students are infected.

There are some diseases that are only transmitted by direct contact. This means that the only way you can catch the disease is to touch the person who has it. Sexually transmitted diseases like gonorrhoea and syphilis are serious examples of diseases that are transmitted by direct contact. In these cases, there must be sexual contact to transmit the disease. AIDS is transmitted through sexual contact or contact with the blood or blood products of a person with the disease.

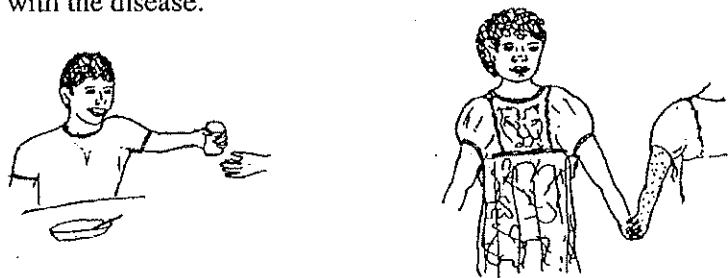


Figure 12. Some ways that disease is spread by contact

5. **By vectors:** The **vector** of a disease is an animal that can pass on the disease to humans. Some examples are flies, rats, cockroaches, fleas and mosquitoes. Flies land on material that contains pathogens and then transfer them to food that is eaten, as shown in Figure 11. Cockroaches and rats can carry diseases in the same way. Rats can also be carriers of fleas which can bite humans and pass on disease organisms in the bites. Malaria is the most common and most serious disease in Vanuatu that is transmitted by a vector, the *Anopheles* mosquito. It is considered to be the most important of all tropical diseases because so many people catch it and it is so hard to control the vector. Dengue fever is also transmitted by a mosquito vector, the *Aedes* mosquito. This disease does not occur as often but does occasionally infect large numbers of people.

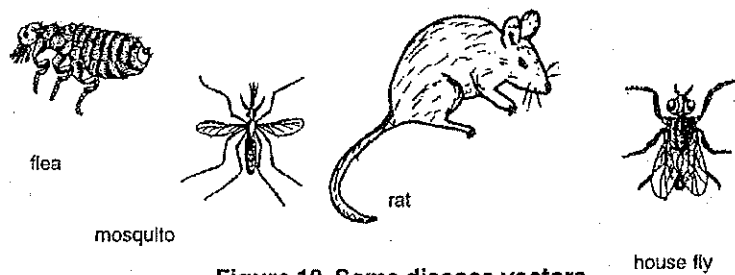


Figure 13. Some disease vectors

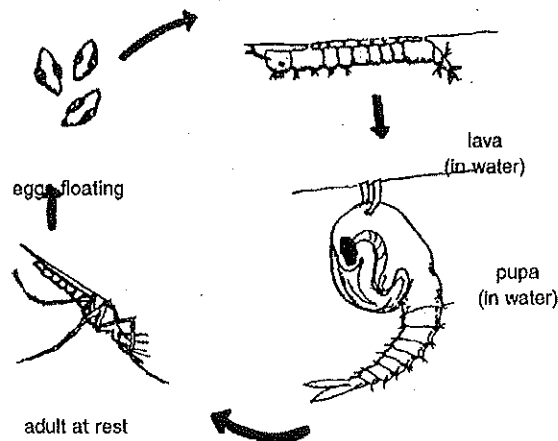


Figure 14. Life cycle of a mosquito

Questions:

- * Q1. Why should you not borrow another student's towels, clothes or bedding?
- * Q2. Explain why so many students might have colds at the same time.
- ✓ Q3. Why should you encourage washing hands after using the toilet,

before cooking meals, and before eating?

- Q4. If 10 bacteria got into your food and they reproduced every 30 minutes, how many bacteria would there be at lunch time if you left the food out at breakfast? (4 hours) *80 or 1280*
- Q5. Draw a diagram of how food poisoning could occur with flies as a vector of the disease.
- Q6. Explain why water might be dangerous to drink after a cyclone or earthquake.
- Q7. List ways that might help control diseases which are carried by vectors, especially those carried by mosquitoes.
- Q8. Think about and list some of the school rules that are made to help protect you from disease.
- Q9. Look at the figure below and see how many things are being done which could cause the transmission of disease. Draw a circle around each one.

Q10. Write a short paragraph describing how you would correct some of the problems in the figure below.



Figure 15. How many things in this picture might spread diseases?

1.3 PREVENTION, DIAGNOSIS AND TREATMENT OF DISEASE

Prevention of disease - How to avoid getting sick

Since disease organisms are so widespread, and can be transmitted in so many ways, we should always take great care to avoid getting diseases. This is called **prevention** - stopping the pathogen from infecting us or preventing the organism from causing the disease.

The skin itself is a barrier to microbes. These can only enter if there is a break in the skin first, like a cut, scrape or bite. Pathogens can also enter through our mouth, nose, or sex organs.

One of the simplest ways of preventing many diseases is by practising good **hygiene** - keeping ourselves clean. This will help us to avoid getting diseases, and also prevent us from passing them on to other people. Some methods which prevent the spread of diseases include covering your nose and mouth when you sneeze, not spitting, and not using other people's clothing, towels or bedding. Simple rules of cleanliness will prevent many common diseases from spreading. You will learn more about the rules of hygiene in Chapter 4.

Sometimes solutions are used which destroy pathogens in our environment, or in wounds, to prevent infection. These are called **disinfectants** and **antiseptics** and are used outside the body.

Disinfectants like Jeyes Fluid or Javel are used on non-living surfaces like tables and cooking utensils and also in drains and toilets. Some disinfectants will kill viruses as well as bacteria and fungi. Using disinfectants helps to prevent the spread of disease by contact with contaminated surfaces. It is particularly important to disinfect tables on which food is prepared.

Antiseptics are used to clean wounds to prevent infection.

Examples of antiseptics are Dettol and Savlon which are often used for cleaning cuts and scrapes to avoid infections. When using antiseptics, you should be sure to follow the instructions on the label.

Another means of preventing certain diseases is by **immunisation**. Immunisation involves getting injections (a needle) from the clinic or hospital. This begins when you are a baby and, for some diseases, continues until you are an adult. The process of immunisation and how it works, is covered in Chapter 2. At this point, however, it is important to know that immunisation is a method of preventing diseases.

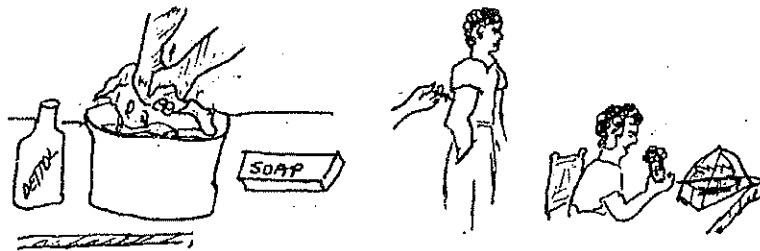


Figure 16. Some ways to prevent disease

Diagnosis of disease

How do you know you are sick and what should you do about it?

All of us have had some disease sometime! Some people do not get "sick" often, but you should know what to do when you feel unwell or have signs of a disease.

How do you know when you have a disease? Most diseases cause characteristic changes in our bodies. These are called **symptoms** and are what help us decide what kind of disease we might have. An example of some symptoms are headache and other pains, fever, vomiting and diarrhoea. Sometimes these symptoms are mild and we can take care of the disease ourselves. If one or more of these symptoms are very severe (serious or strong), we should go to the clinic or see a doctor. Even if they are not so strong, if they last for more than one or two days, a visit to the clinic is needed. For example, most boils, small cuts and scrapes do not need treatment from the clinic but if the boils are very bad, or the cuts get infected and do not heal well, then the symptoms would tell you it is time to visit the clinic.

Diseases in babies and small children must be watched very carefully. If there is frequent vomiting or diarrhoea, young children may quickly become seriously dehydrated (meaning they do not have enough water in their bodies).

Even in adults, symptoms should be watched to see if the disease is getting worse or spreading. If skin diseases are getting larger, or swollen places appear under the arms or in the groin, or fever increases, then a doctor's advice is needed. If custom medicine is being used, symptoms should be looked at to make sure that the medicine is working. If the symptoms last a long time, or become worse, you should visit the clinic.

Serious accidents with severe wounds, or any case where the patient is unconscious, means getting to a clinic quickly for help.

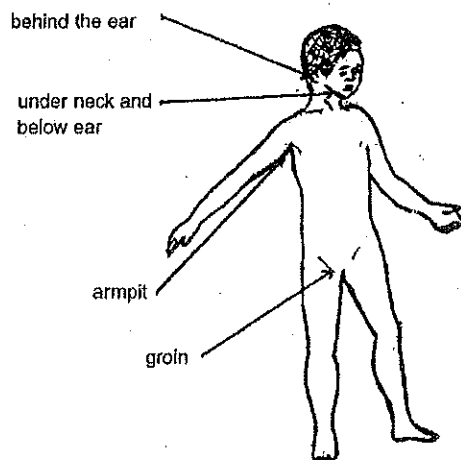


Figure 17. Some places to check for swelling that indicate infection

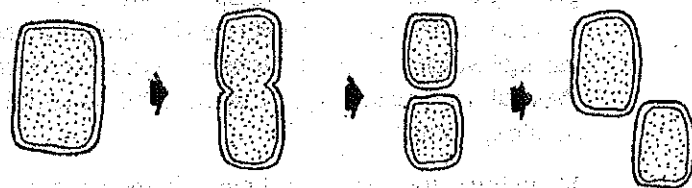
Questions:

1. Your two year old sister has diarrhoea but has been eating and drinking and has no fever. The next day she will not eat or drink and still has diarrhoea but with no fever. Should you take her to the clinic? Explain your answer.
2. Pretend that you are a nurse at the clinic. A man comes in to see you and tells you he is "sick". Think of some questions that you will need to ask him. (Hint: you are trying to find his symptoms.) Try this with a partner who has chosen an "illness".

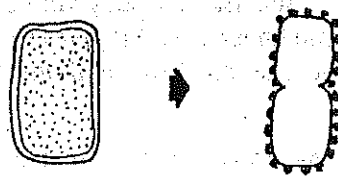
Treatment of diseases

When you go to the clinic and receive treatment for a disease, the doctors, nurses or health workers may try to **cure** the disease or they may only **treat** the **symptoms** of the disease.

Curing the disease: This means that the treatment is actually trying to kill the organisms that cause the problem. **Antibiotics** and some other medicines do this. The antibiotics get into the blood and are carried to the infected area to kill the organisms. The word "antibiotic" means "against living things". Antibiotics are used to kill bacteria and fungi. Some destroy the cell walls of the bacteria; others attach to the cell walls so that the bacteria cannot reproduce; others get inside the bacteria and kill them. Antibiotics cannot kill viruses because viruses do not have a cell wall for them to attack, and they are too small for them to get inside.



bacteria reproduce by splitting in two (binary fission)



bacterium with penicillin on a cell wall

The bacterium cannot make a new cell, therefore it cannot reproduce.

Figure 18. How one antibiotic works against bacteria

Here are some examples of antibiotics and the diseases that they are used to cure:

Penicillin. Many different types are available and are used against the bacteria which cause boils, sore throats, syphilis, gonorrhoea and pneumonia.

Streptomycin. This is used to cure tuberculosis.

Chloramphenicol. This is used to fight typhoid.

Sulphonamides. Many different types are used against pneumonia, dysentery and meningitis.



It is very important that **all of the antibiotic** that is prescribed by the doctor or the clinic is used, even if you feel or look better. If you only take part of the medicine, you can create future problems for yourself and for others.

Taking part of the medicine, just until you feel better, can leave a few of the germs in your body, so you may become sick again. Another problem that can be caused by taking only part of the medicine is called **drug resistance**. If only a part of the treatment is taken, the germs that survive are those which fight most strongly against the medicine. When these germs reproduce, you may get sick again or pass the disease onto others, but this time the same antibiotic will not kill them so easily! They have become **resistant** and doctors may have to search for new medicines.

Treatment of symptoms. Sometimes the clinic may not try to cure a disease but only to treat some of the symptoms. This gives a chance for the natural defences of the body to work against the disease. A good example of this is treating a cold. Colds are caused by viruses and antibiotics cannot kill them, but there are medicines that will treat the symptoms. For example, if you have a cough, the clinic can

give you a medicine that will ease the cough. This may help your body to get enough rest so it can fight the virus itself. Another example is panadol which is often used to reduce symptoms such as pain or fever. Panadol is not a cure for any disease, but it is a useful treatment for certain symptoms.

Many times the doctor or clinic will use a combination of curing the disease and treating symptoms. For malaria, drugs like chloroquine are used to cure the disease by killing the protozoa that cause it. At the same time panadol is given to treat the symptoms, such as headaches and fever, until the disease is cured.

Questions:

- ✧ Q1. Match the following terms with the situations in which you might use them: *antiseptic, disinfectant, antibiotic.*
- A. You have fallen down while playing soccer and have scratched your leg. You have not gone to the clinic because it is not serious.
 - B. You have a cold and do not want to pass it on to your friend who must prepare food at the same table.
 - C. You have a boil on your leg and swelling in your groin, so you have gone to the clinic for help.
- ✧ Q2. What is the difference between curing a disease and treating the symptoms?
- ✧ Q3. You wake up one morning with a sore throat and a bit of a cough. Two days later you still do not feel well and realise that you have a cold. Should you go to the clinic and ask for antibiotics to cure your cold? Explain your answer.

1.4 SOME IMPORTANT DISEASES: THEIR TRANSMISSION, SYMPTOMS AND TREATMENT

The listing below gives some of the more important diseases in Vanuatu and what causes them (their causative agent), how you can catch them (means of transmission), information on the symptoms of the disease and its prevention and treatment. You will learn more about prevention in later sections.

Measles (especially dangerous in young children):

Agent - a virus transmitted in the air.

Symptoms - first fever and runny nose, followed by a rash on the face which spreads down the body.

Treatment - symptoms only treated - body must try to cure itself.

Prevention - immunisation.

Poliomyelitis (polio):

Agent - a virus transmitted by food or water.

Symptoms - sometimes a minor, "flu-like" illness but may attack nerves controlling the muscles and cause permanent paralysis.

Treatment - symptoms only treated - body must try to cure itself.

Prevention - immunisation - good food and water hygiene.

Dengue Fever:

Agent - a virus transmitted by the bite of a mosquito.

Symptoms - headache, muscle pain, fever, then a rash.

Treatment - symptoms only treated - body must try to cure itself.

Prevention - killing mosquitoes, destroying their breeding sites, using screens to avoid mosquito bites.

Tuberculosis (TB):

Agent - a bacterium transmitted by air, especially by spitting.

Symptoms - usually starts with dry cough, then spitting blood; ends in wasting of body (getting very thin) and death; may affect other organs but usually lungs.

Treatment - cured by special drugs over a long time.

Prevention - immunisation; no spitting, cover mouth when coughing.

Tetanus (usually fatal once symptoms appear):

Agent - a bacterium from dirt in deep wounds.

Symptoms - muscular spasms and convulsions.

Treatment - symptoms only treated but usually fatal.

Prevention - immunisation; unimmunised people who get deep wounds, which may be infected, must be treated by immunisation before symptoms appear.

Whooping Cough:

Agent - a bacterium in the air.

Symptoms - fever, vomiting, severe fits of coughing which make it hard to breathe.

Treatment - antibiotics.

Prevention - immunisation.

Red Eye:

Agent - bacterium transmitted by contact.

Symptoms - burning and itching eyes, red eyes that "run".

Treatment - antibiotic cream for eyes.

Prevention - good hygiene and avoiding contact with infected people or their clothes; towels or bedding.

Malaria:

Agent - protozoan transmitted by mosquito bites.

Symptoms - fever with headache and body pains.

Treatment - drugs available for cure and treatment of symptoms.

Prevention - killing mosquitoes and destroying breeding sites, using screens to avoid bites.

Ringworm (round itchy patches on the skin):

Agent - fungus transmitted by contact with infected people, clothes, bedding, animals and so on.

Symptoms - round or irregular scaly patches which itch.

Treatment - drugs which kill the fungus, local cures.

Prevention - avoid contact with infected people.

White Spot: - very similar to ringworm as to agents, treatment, and prevention; symptoms are white patches on the skin which are not scaly and may or may not itch.

Hookworm (infects the intestines and sucks blood):

Agent - parasitic worm living in damp soil; enters the body through skin of the feet or in contaminated water.

Symptoms - tiredness, aching muscles, breathlessness all due to the anaemia from loss of blood.

Treatment - drugs to kill the parasite and iron to help build the blood.

Prevention - good sanitation to avoid fouling soil and water with infected faeces; wearing shoes.

Head Lice (feed by sucking blood, may carry other diseases):

Agent - parasitic insect transmitted by contact, clothing, etc.

Symptoms - cause itching; can see eggs attached to hairs.

Treatment - kill lice with insecticides.

Prevention - avoid contact with those infected and their clothing, bedding, etc.

Scabies:

Agent - parasitic mite transmitted by close contact.

Symptom - itching skin, then scratching which can lead to sores which become easily infected.

Treatment - kill mite with insecticide cream.

Prevention - avoid contact with those infected or their belongings, wash with medicated soap when available.

Questions:

- Q1. How can you catch malaria? What can you do to make the chances of catching malaria go down?
- Q2. Name a disease that is caused by a virus and tell how it might be prevented or controlled.

- Q3. If you borrow another student's pillow, which diseases might be transmitted to you?
- Q4. List the diseases that can be prevented by immunization.
- Q5. Name the diseases that are transmitted by droplet infection (in the air).
- Q6. Check around school and make a list of the diseases that some of the students have had. Decide how they were transmitted and what might be done to prevent them occurring again.

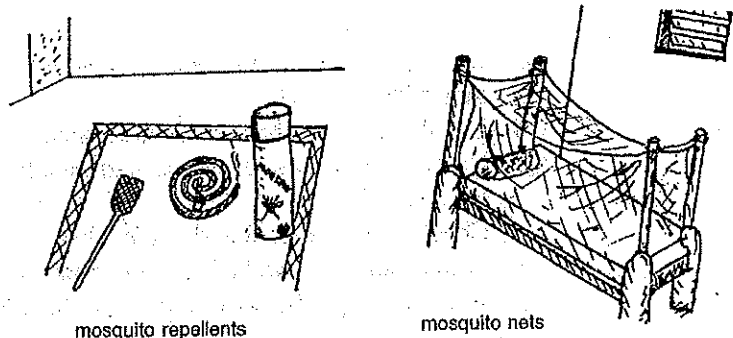
Prevention of infectious diseases, including malaria, in school

Students in Vanuatu usually live with many other students in close quarters in dormitories. These conditions lead to the transmission of many diseases, especially head lice, scabies, ringworm and malaria. To prevent these diseases, the following rules should be followed.

1. Buy your own hair combs or brushes and don't share them with others.
2. Sleep only on your own bed or pillow, not another's.
3. Buy your own bed sheets, pillowcases and towels. Don't let others borrow these items from you.
4. Use your own cup, plate, eating utensils and toothbrush. Keep these items clean.
5. Hang wet clothes and towels outside in the sun, not in the dormitories.
6. Eat only in the dining hall and keep food out of the dormitory.
7. Treat sores, scabies, headlice and ringworm quickly before they have a chance to get worse or infect others.
8. Keep sores clean and covered with clean dressings.

For malaria prevention follow these guidelines:

9. Destroy places where mosquitoes breed.
10. Kill larvae and mosquitoes using sprays.
11. Keep mosquitoes away by using repellents in the room and on the exposed parts of your body.
12. Wear protective clothing .
13. Screen doors and windows and use mosquito nets on beds.



mosquito repellents

mosquito nets

Figure 19. Methods to help stop the spread of malaria

CHAPTER 2

IMMUNITY AND VACCINATION

2.1 THE BODY'S DEFENCES AGAINST DISEASE

Our bodies have many ways of defending themselves against the harmful micro-organisms, and particularly the viruses and bacteria, around us. These defences give our bodies protection or immunity against infection.

Our first defence is the skin. It has an outer layer of dead cells which form a barrier or wall against the entry of disease organisms. The skin is also covered with an oily, antiseptic liquid called sebum. It protects us against most germs.

This and some other methods of defence provided by the body are shown below.

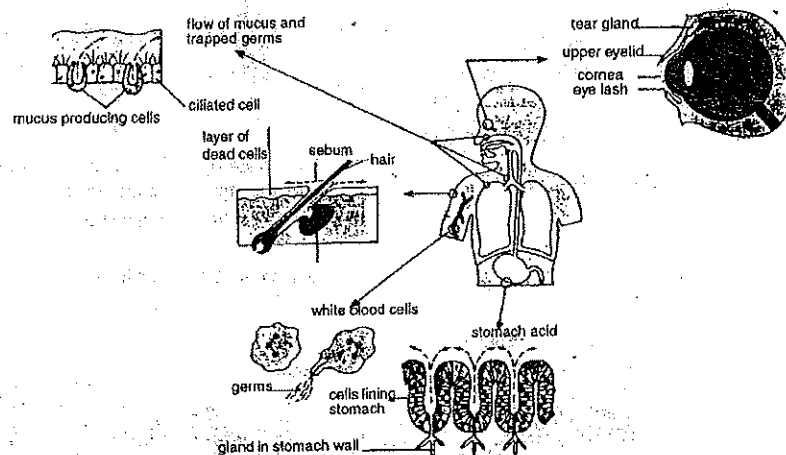


Figure 20. Some of the body's methods of defence

1. The nose and air passages are lined with cells which make a sticky fluid called mucus. This traps germs and dirt from the air we breathe. Tiny hairs called cilia move the mucus, germs and dirt to the throat, where they are coughed up or swallowed and pass harmlessly out of the body.
2. The lining of the stomach produces acid for digestion. This acid also kills some of the germs which enter your body in food and drink.

3. Your eyes are protected by an antiseptic liquid which comes from the tear glands. Your eyes are washed with this liquid every time you blink.

Questions:

- Q1. If you cut your foot on a rusty nail, in what ways could bacteria enter your body?
- Q2. Millions of bacteria are on our fingers. When we rub our eyes, bacteria can enter the eye. What method of defence against bacteria does the eye have?
- Q3. Name three different ways in which the body stops micro-organisms entering the body.

Sometimes the skin is broken or damaged when we get a cut or graze ourselves. This open wound leaves a way open for germs to get into the body. However the body has a mechanism which quickly seals the wound, stops the flow of blood and blocks the entry of more harmful bacteria. This **blood clotting** is shown in the following two diagrams.

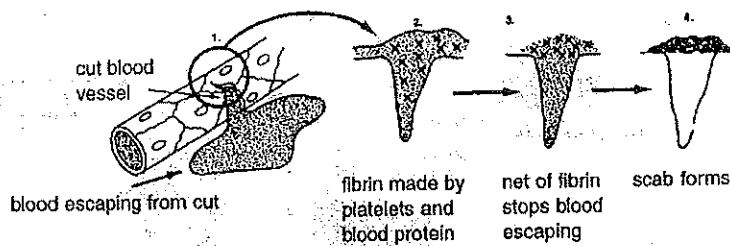


Figure 21. How blood clots

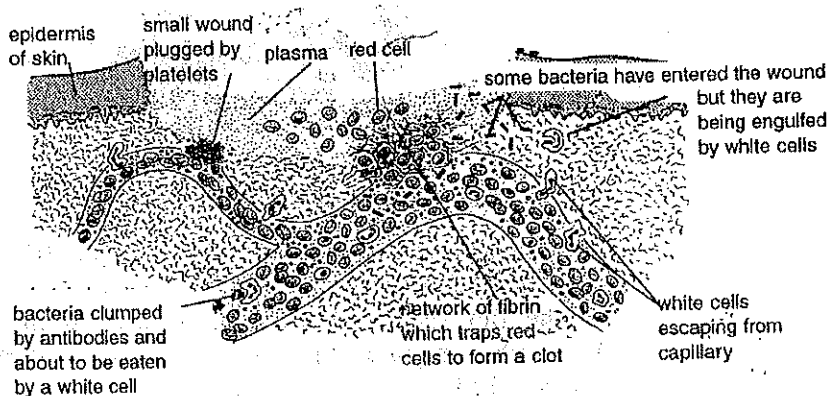


Figure 22. Our defences against infection

When the skin and blood vessels are cut, platelets flow in the blood to the cut. Platelets are small pieces of very large cells in the blood. They contain chemicals to start the blood-clotting process.

Platelets and damaged cells clump together at the wound and the platelets produce a substance which converts a protein in the blood to long, thin fibres called **fibrin**. These fibres clump together, forming a network (like a mosquito screen) that traps the platelets and red blood cells at the wound to form a solid **clot**. The clot contracts, pulling together the edges of the wound. This later dries out and forms a **scab**.

ACTIVITY 5

CLOTS AND SCABS

Examine your arms and legs and find a wound with a scab (dried blood clot). Look carefully at the edges. Do they appear to be tight and drawn in? Why does the scab appear this way?

Questions:

- * Q1. Name four of the things that collect at the site of a wound.
- * Q2. What two things does a blood clot do?
- * Q3. What is pus?
- * Q4. Do you think it is a good idea for us to remove pus from a wound by pricking it with a pin? Explain your answer.

White blood cells

Although the wound has been sealed again, many bacteria may enter before the clot has formed. They will be trapped under the clot and will begin to multiply very quickly.

The body's reaction to this invasion involves special cells called **white blood cells** which are carried by the blood. The white blood cells form a major part of the protective or **immune system** of the body. There are several different kinds of white blood cells. Some can move about by themselves. They squeeze through the walls of the blood vessels and move between the cells. They destroy the harmful bacteria by eating and digesting them. When we have cut ourselves and bacteria have entered the wound, white blood cells eat the harmful bacteria and stop them entering our blood circulation. This is shown in the following picture.

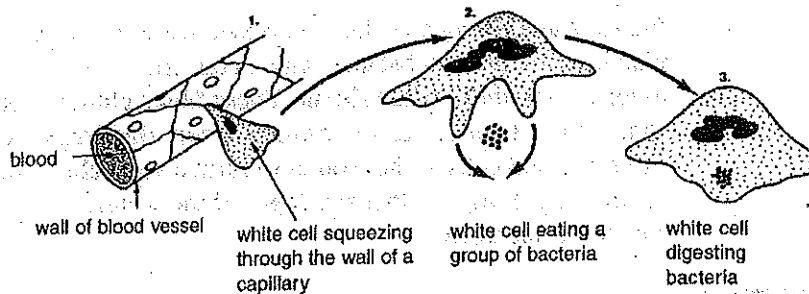


Figure 23. How white cells kill bacteria

If the infection is severe, many white blood cells are involved in killing the germs which have entered the body. Many white blood cells die in the process. The dead white blood cells, with bacteria and fluid and some live white blood cells, form a mixture called pus. The pus collects at the site of the wound. As the wound heals, the pus slowly drains away.

White blood cells are made in the bone marrow and in a system (which you have not studied) called the lymphatic system. There are about 600 red blood cells to every white blood cell, but the number of white cells increases if you are ill or when you do hard exercise.

Questions:

- Q1. When bacteria have entered a wound, what is the body's next line of defence?
- Q2. What do white blood cells do in response to bacteria?
- Q3. Why is it important that white blood cells should be able to move through the walls of capillaries?
- Q4. Why do you think the number of white blood cells increases when we get ill?
- Q5. Write a few sentences explaining what happens after you have cut your finger. Use Figure 22 as a guide.
- Q6. Examine the following diagram of blood under a microscope.
 - a. List three components of blood shown in the diagram.
 - b. Beside each component, state its function.

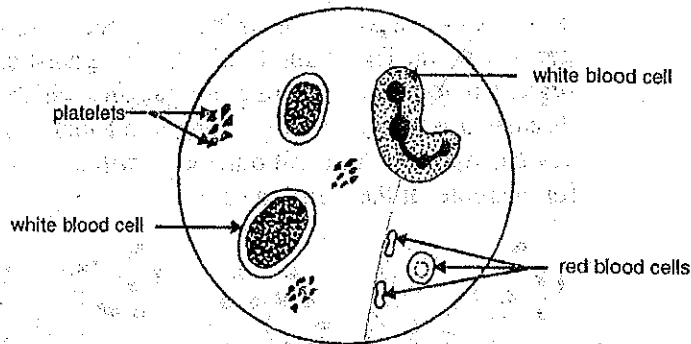


Figure 24. Components of blood

2.2 SPECIFIC IMMUNITY - ANTIBODIES

White blood cells also play another role in defending the body against diseases. This is the third line of defence for the body.

Some white blood cells produce chemicals called **antibodies**. These antibodies are produced in response to invading bacteria or viruses. They attack and destroy the harmful micro-organisms which have entered the body. They may also simply neutralise the toxins produced by the bacteria.

How antibodies work

Bacteria, viruses and other micro-organisms are covered with substances (proteins) called **antigens**. When white blood cells come into contact with these antigens, they recognise that they are "foreign". They do not belong in the body. The white cells then make **antibodies** which can combine with the "foreign" antigens. This kills the micro-organisms by making them burst or stick together in clumps. This makes it easier for white blood cells to engulf them.

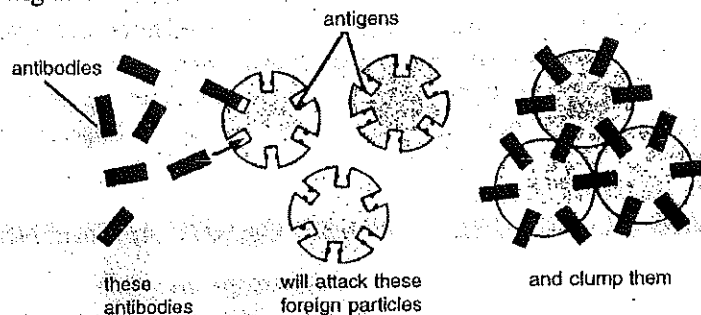


Figure 25. How antibodies work

A different antibody is needed to kill each type of germ. The production of a particular antibody is specific to that particular germ or toxin. The antibody which acts against one micro-organism does not affect micro-organisms which cause a different disease. It is a bit like a key fitting into a lock. Only one special key can open the lock. All other keys will not open the lock. Look, for example, at the diagram below.

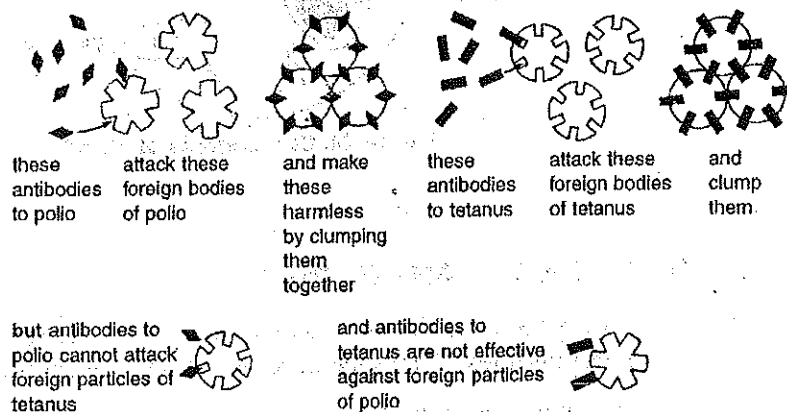


Figure 26. Antibodies are specific

To take another example, if you catch measles, your body will respond by making antibodies against the measles virus. The antibodies to measles will destroy the measles virus and you will slowly get better. However, if you catch tuberculosis at the same time, the antibodies made against measles will not destroy the tuberculosis bacteria. The body must make different antibodies to destroy the tuberculosis bacteria.

Questions:

- ✓ Q1. What are the three lines of defence for the body against micro-organisms which cause disease? *Skin, WBC, antibodies*
- ✓ Q2. What two things do white blood cells do to help fight disease? *destroy & engulf & produce chemicals*
- ✓ Q3. Describe how antibodies do their work. *clump*
- ✓ Q4. I have had chickenpox. Will I have antibodies against measles in my body too? Explain your answer. *No*
- ✓ Q5. John caught measles in 1986. His sister caught measles in 1987 but John didn't catch them again. Explain why.

OPTIONAL ACTIVITY 6 ANTIBODIES CLUMP CELLS WHICH CARRY ANTIGENS

You will need:

- microscope and slide
- lances, sterile needle or pin

Your red blood cells have antigens on them. There are two different sorts of antigens called A and B which determine your blood

group. You may have one or both or neither of these antigens on your red blood cells. Whichever one you have, you will also have the antibodies to the opposite antigen as shown below.

| Blood Group | Antigens on red blood cells | Antibodies in serum |
|--------------------|------------------------------------|----------------------------|
| A | A | anti-B |
| B | B | anti-A |
| AB | A & B | - |
| O | - | anti-A and anti-B |

Serum from a blood group B person will contain anti-A antibodies. These antibodies will react with antigen A on the red blood cells of blood group A people. This reaction will clump the group A red blood cells together.

- 1. Get a clean sterile lance or pin and prick your finger. Squeeze a drop of blood onto a clean microscope slide.*
- 2. Get another person to put a drop of their own blood on your microscope slide. Do not use the same lancet or pin as anyone else. Do not touch anyone else's blood. Wash your hands well after the experiment.*
- 3. With a pin, mix the two drops of blood together. To avoid the blood drying before it clots, keep the microscope slide cool but away from the wind.*
- 4. Watch carefully and see if the red cells clump together (forming little particles).*
- 5. If you see clumping, you and your partner have different blood groups. If there is no clumping, you may have the same blood group.*

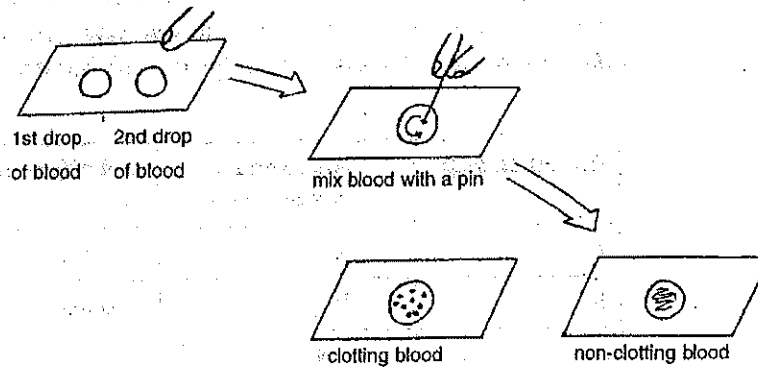


Figure 27. Method for Optional Activity 6.

Questions:

- * Q1. Did you see any clumping with your blood?
- * Q2. Did anyone else in the room see clumping?
- * Q3. Try to explain why a blood group A person's blood will clump a blood group B person's blood.
- * Q4. Why is it important that you don't touch anyone else's blood with your fingers in this experiment?

This antigen-antibody reaction is very similar to the clumping reaction of our antibodies with bacterial antigens. This test for blood groups is used every time someone has a blood transfusion.

The secondary response

When a new micro-organism enters the body, one which has not ever been "seen" by the white blood cells of the body before, antibodies are produced. This occurs slowly at first. The white blood cells are "learning" how to make new antibodies to fight the new micro-organism. During this time, the disease often has time to develop, we become sick and the symptoms of the disease appear.

However, if the micro-organism or toxin which enters the body has been "seen" before, then large numbers of the correct antibodies are produced very quickly. It is as if the white blood cells "remember" how to make the antibodies to the disease. Because large numbers of antibodies are released quickly, the invading micro-organism is destroyed quickly and the disease and its symptoms are usually prevented. This is called the **secondary response**.

For example, most people suffer from mumps only once, although they may come into contact with the virus that causes mumps several times in their lives. In those rare people who do suffer from

mumps twice, the second attack is usually much milder than the first. It appears that the response of the body to the mumps antigen is more efficient the second time it enters the body. The white blood cells have remembered how to make antibodies to the mumps virus. So many are made so quickly that they usually destroy the virus before it has a chance to give us the symptoms of mumps again.

Questions:

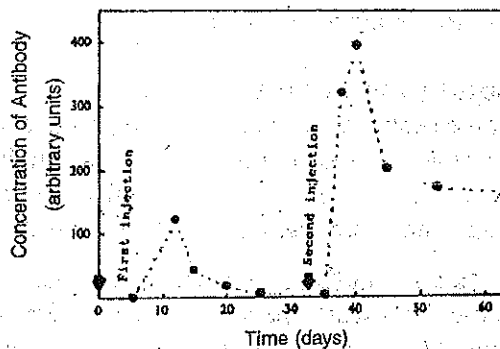


Figure 28. The secondary response

This graph shows the amount of antibody produced by a mouse when it is injected with two doses of typhoid bacteria. It also shows how long it takes for the antibodies to typhoid to be produced. The arrow at time 0 shows when the first injection was given. The second arrow, at time 33 days, shows when the second injection was given.

- * Q1. What do you notice about the amount of antibody produced after the first injection, compared to the amount produced after the second injection? *after second was more*
- * Q2. What do you notice about the time taken to reach the maximum amount of antibody produced after each injection? *First standing arrow. Second*
- * Q3. How long is it between the injection time and the time when antibodies are first produced in each case? Can you explain the difference? *6 days & 2 days (seen 2nd time so it's fast to make antibody because they have memory before)*
- * Q4. In each case, how much antibody remains 30 days after injection? *1 - none 2 - 200 (none)*
- * Q5. Do a survey in your class. Count how many people have had mumps once and how many have had mumps twice. What about chickenpox? Fill out the following table.

| Disease | Number of people affected once | Number of people affected twice |
|------------|--------------------------------|---------------------------------|
| Mumps | | |
| Chickenpox | | |
| Measles | | |

Try to explain your results.

Natural and acquired immunity

Some people are naturally able to produce large numbers of the necessary antibodies quickly even though their bodies have not apparently "seen" the micro-organism before. These people are said to have **natural immunity** to a particular disease.

Once the white blood cells of a person have made antibodies to a particular disease, the antibodies may remain in the blood for some time. The amount of time varies for different diseases. Even when the antibodies have eventually been lost from the blood, the white cells can usually make them again very quickly. Measles and chickenpox antibodies are lost quickly, but the white blood cells which made the antibodies "remember" how to make them again very quickly. Therefore a person is unlikely to get these diseases a second time. A person who has the antibodies in their blood still, or whose white cells "remember", is said to have **acquired immunity** for that particular disease.

Breast milk contains some antibodies. These help to increase the resistance of newborn babies to certain diseases. This is one major advantage of breast feeding babies.

Question:

Q1. David was sick with chickenpox. He was nursed by three different people. His mother Sarah (who had had chickenpox herself as a child), his wife Marie (who had never had chickenpox) and his sister Anna (who also had never had chickenpox). David got better, but a week later Anna also became sick with chickenpox. Marie and Sarah did not catch the disease. State the type of immunity that each person had before David was sick: **acquired, natural or none.**

2.3 VACCINATION

You do not have to catch a disease to make antibodies against it. You can be given an injection called a vaccine which causes your body to produce antibodies, so you are ready to fight off an infection

before the germs arrive. In this way you can become immune to the disease before you ever get it. This is an advantage in many ways which will be discussed more fully later. But, briefly, it saves us suffering the symptoms of the disease and means we do not have to pay for the medicines or doctor's visits which we would need if we did get the disease. In fact, vaccinations probably save millions of lives around the world each year.

A vaccine contains either dead germs, harmless germs or a harmless germ toxin which are injected into your body. The white blood cells "see" the harmless germs and make the correct antibodies to them, just as if real live germs had invaded your body. If the real germs do get into the body at some later time, the antibodies are already present or can be made very quickly (the secondary response) and the symptoms of the disease do not occur.

A vaccine encourages the body to make its own antibodies. It is used before a person gets the disease. It usually takes a week to 10 days for the body to produce sufficient antibodies to protect itself from a real infection later. The protection against the disease is long lasting (10 years in the case of tetanus).

Questions:

- * Q1. I have been given a vaccine for Hepatitis B (an infectious liver disease). Explain what I have been given and how the vaccine will work to stop me getting Hepatitis.
- * Q2. Give two pieces of evidence which show that the immune system has a memory.
- * Q3. The disease tuberculosis is associated with infection by a bacterium. Many people come into contact with this bacterium at some time during their lives, but only a few develop symptoms of the disease. What are some possible explanations for this?
- * Q4. Describe two ways in which your body can become immune to a disease.
- * Q5. If you have been vaccinated against polio, is this vaccine any good at protecting you from getting diphtheria? Explain your answer.

Childhood vaccinations

DO THIS

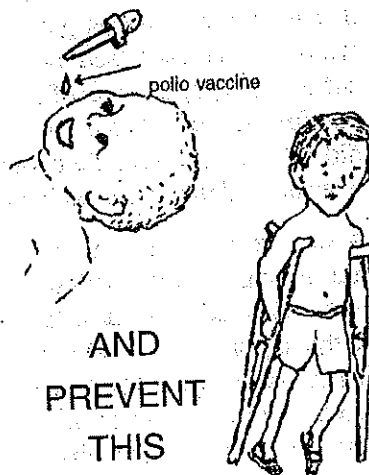


Figure 29. Vaccination against polio

All children in Vanuatu must be given vaccinations against certain diseases when they are quite young. These childhood vaccinations are sometimes called immunisations. You may remember your own vaccinations or those of your younger brothers or sisters. A record of these vaccinations is kept on the Ministry of Health's "Child Health Record Card". Part of this card is shown on page 40. Each child is given five different types of vaccinations. Some of these vaccinations have to be given more than once. After a child has received one of the injections, the doctor signs and dates the Child Health Record Card in the correct space in the table.

The five different vaccination injections are:

1. **BCG** - This is a vaccine for tuberculosis (TB). It contains bacteria which have been modified to make them harmless. A single dose is given at birth.
2. **DPT** - This is a mixed vaccine for three different diseases - Diphtheria (a bacterial disease of the throat - a harmless form of the toxin it produces is used), Whooping Cough (Pertussis - dead bacteria are used) and Tetanus (a harmless form of the toxin is used).

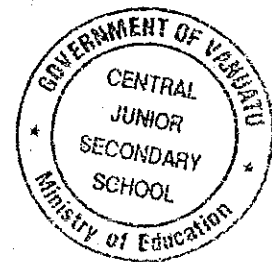
Three doses are given at monthly intervals to be fully effective. The first one is given at about six weeks after birth. A further vaccination or booster dose is given when children reach school age.

A booster dose is like a helper, or reminder, vaccination. It makes sure the white blood cells remember how to make the antibodies.

3. **Polio** - The polio vaccine is given by mouth (on a lump of sugar or from a dropper) and is not an injection. It consists of the killed polio virus. This vaccine also needs three doses given at monthly intervals at the same time as DPT. A booster is given at school age.
4. **Measles** - The vaccine against measles requires only a single dose and is given later than the others. It consists of the dead virus.
5. **Hepatitis B** - All children in Vanuatu are now being vaccinated against this liver disease. The vaccine is given in three doses over six months.

Questions:

- * Q1. How do you think the DPT vaccination got its name? Which diseases does it immunise you against?
- * Q2. What are the four other diseases a child must be vaccinated for?
BCG, Polio, Measles, Hepatitis B
- * Q3. What is a booster injection?
It is like a booster or secondary vaccination.
- * Q4. Examine the Child Health Card shown on the next page and copy it into your books. Baby Simon was born on 1 January 1981. Now answer the questions about baby Simon which follow:
 - a. What was the first vaccine he should have been given? *BCG*
 - b. When should he have been given this vaccine? *At birth*
 - c. If Simon had his first DPT vaccination on 14 February on which dates should he have been given the other DPT vaccinations? *14 Feb, 14 Mar, 14 Apr*
 - d. Which other vaccine could have been given at the same times? *Polio*
 - e. What is different about this particular vaccine? *Given by mouth*
 - f. Simon received his measles vaccine on 1 January 1987. What age was he then? *6*
 - g. Which vaccines require "boosters"? *DPT & Polio*
 - h. Fill in all the dates for baby Simon on your copy of his Health Card.



Child Health Record/Fiche Medicale pour Enfant

CENTRE:

| |
|---|
| Child's name <i>Simon</i> Nom de l'enfant |
| Date of birth <i>1/01/81</i> Date de naissance |
| Sex <i>M</i> Sexe |

| |
|-------------------------------|
| Family No. Famille No. |
| Family name Nom de famille |
| Village |
| Village |

| | | |
|-----------------------------------|--|--|
| Birth information Antecedents: | Birth weight Poids la naissance | <input type="text"/> |
| Delivery Accoucement | Normal / Anormal Normal / Anormal | Hospital / Dispensary / Home Hôpital/Dispensaire/Domicile |
| Birth attendant Accoucheur | Medical / Non medical Medical / Non medical | |

Immunizations

| Date 1 | 2 | 3 | Booster/Rappel |
|---------------------------------|--------------|--------------|----------------|
| B.C.G. <i>1/81</i> | | | |
| D.P.T. <i>12/82</i> | <i>16/83</i> | <i>15/84</i> | |
| D.T.Coq | | | |
| Polio <i>14/82</i> | <i>18/83</i> | <i>15/84</i> | |
| Measles/Rougeole <i>1/01/87</i> | | | |
| | | | |
| | | | |

| |
|----------------------|
| Remarks - Remarques |
| |

Vaccinations for overseas travel and during epidemics

Apart from the vaccinations given in childhood, vaccinations may also be given if you travel overseas or if there is an **epidemic** of a disease in your country.

People travelling to overseas countries can be exposed to many diseases which they have not met in their own country. Because they have not met the disease before, and therefore have no antibodies to it, they are very likely to catch the disease. If they return to their own country carrying the germs of the disease in their body, many other people at home may be infected. It is therefore important to be vaccinated against the diseases that are common in the country to which you are travelling.

For example, Australians travelling to Vanuatu should be immunised against Typhoid Fever and Diphtheria. These diseases, although quite common in Vanuatu, are rare in Australia. If a tourist is immunised against these diseases before he comes to Vanuatu, he will not catch these diseases or take them back to Australia in his body.

Sometimes a new disease, or a different form of a familiar disease, can get into a country or area. Because the people have no **acquired immunity** to the disease, many people catch the disease in a short time. Nearly everyone gets sick from the disease. This is called an **epidemic**. During epidemics, people who are not yet affected are vaccinated against the disease. This is to try to stop the disease from spreading any further in the country.

Questions:

- Q1. On the next page is a list of diseases for which, if you live in Australia, you should receive vaccines before you leave Australia to travel overseas to different countries.
- If you are going to Bangladesh, what diseases should you be vaccinated against?
 - If Tom received vaccines for Hepatitis A and Typhoid, to which country could he have been travelling?
 - What disease is most widespread throughout the world?
- Q2. For what two reasons should you be vaccinated against disease when you travel overseas?

Table 1. Vaccinations for Australians travelling overseas

| Country | Cholera | Hepatitis | Typhoid | Yellow Fever |
|------------|---------|-----------|---------|--------------|
| Bangladesh | | ✓ | ✓ | ✓ |
| Cameroon | ✓ | ✓ | ✓ | ✓ |
| England | | | | |
| Fiji | | | ✓ | ✓ |
| India | ✓ | ✓ | ✓ | ✓ |
| Kuwait | | ✓ | ✓ | |
| PNG | | | ✓ | ✓ |

Q3. People living on small Pacific islands are normally free of colds. When a ship calls at an island, its visit is often followed by an epidemic of the common cold. As soon as all the islanders have recovered, the cold disappears again. No one catches another cold until another ship visits the island. Try to explain why this happens.

Q4. In many African countries, there are epidemics of influenza. Health authorities carry out mass vaccination programs during this time. Explain why.

Serums

There are many ways in which a person who is already sick from a bacterial disease can be treated by a doctor. Antibiotics and some other medicines are discussed earlier in this section. A **serum** can also be given to the sick person. A serum already contains antibodies against a disease. The person receiving the serum therefore gains antibodies already made, and has immediate protection against the disease. Serums are obtained from the blood of an animal. The animal is vaccinated against the disease concerned and produces the correct antibodies in its blood. The liquid part of this blood (the plasma, which is sometimes also called the serum) can then be used to help cure some one who is already infected with the disease.

Blood left to stand looks like this.

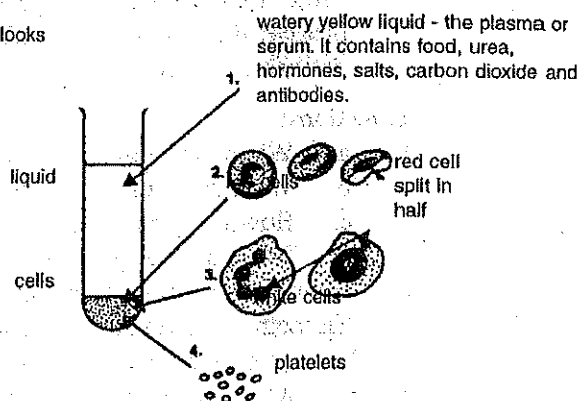


Figure 30. Components of blood

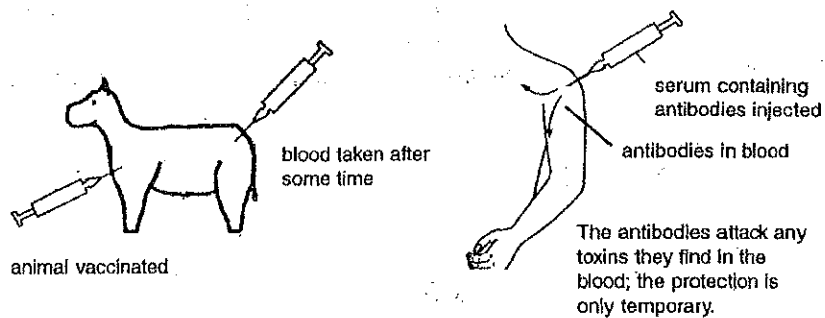


Figure 31. Collection and use of a serum

The most commonly used serum is the one used against tetanus. The bacterium which causes this deadly disease is very common and may be carried into the body when it is cut with a dirty object. This is very dangerous if the wound cannot be well cleaned. Any person who is not immunised against tetanus, and who cuts himself deeply, should be given an anti-tetanus serum immediately. This kills any tetanus bacteria which may be present, before the disease can develop. Once severe symptoms develop, it is too late and the disease is usually fatal.

The major differences between a vaccine and a serum are as follows:

A **vaccine** stimulates the body's immune system to make its own antibodies. It is given before a person gets a disease to prevent them suffering the symptoms of the disease. It has a long lasting effect in most cases.

A **serum** actually provides antibodies which the body needs to fight an infection, and which it is too slow in making for

itself. It is injected after a person has been infected by a disease. It has a temporary effect only and protects the person until he can make enough antibodies of his own.

Questions:

- * Q1. a. Where do serums come from?
- b. What do serums contain?
- c. How are serums made?
- d. When are serums given to a person?
- * 2. Sammy cut his foot deeply on some rusty iron while playing. His mother washed the wound quickly and took Sammy off to the hospital to get a tetanus serum injection.
 - a. Why was Sammy's mother concerned that Sammy might have got tetanus?
 - b. What does the tetanus serum do?
 - c. What could have happened if Sammy had not had the injection?
- * 3. State three differences between vaccines and serums.

CHAPTER 3

SEXUALLY TRANSMITTED DISEASES

3.1 SOME COMMON SEXUALLY TRANSMITTED DISEASES

Sexually transmitted diseases (STDs) are infectious diseases which are transmitted by having sexual intercourse with an infected person. They used to be called Venereal Diseases or VD's.

Most of these diseases are caused by viruses or bacteria. There are more than 20 different STDs, but the three most common ones are gonorrhoea, syphilis and chlamydia. Other STDs include herpes, genital warts, trichomonas ulcers, chancroid, hepatitis B and AIDS. AIDS is fatal.

Many STDs can be completely cured by penicillin or other antibiotics. However, many forms of the gonorrhoea bacteria have become resistant to penicillin and are now common in parts of the Pacific, including Fiji. They require much greater doses of penicillin, or the use of more expensive drugs. There is no cure for AIDS. As yet there are no vaccines to prevent STDs (except for Hepatitis B). After an attack, immunity is usually short-lived and people can be infected again and again.

The number of people who are infected with STDs is increasing, especially among the younger age groups. If left untreated, some of these diseases may attack some of the major organs and systems of the body and may lead to sterility, blindness, insanity and death.

STDs are often more dangerous to women than to men. This is because women often have fewer noticeable symptoms than men, and often do not know they are infected until they are already infertile or seriously ill. STDs in pregnant women may result in miscarriages and the death of the baby before birth.

Figures 32 and 33 show the male and female reproductive organs. You should revise your Year 9 work on Human Reproduction and make sure that you fully understand the diagrams before you continue.

Below are some notes concerning some of the more important STDs. AIDS is dealt with in a separate section later.

Syphilis

Syphilis is caused by a bacterium called a *Spirochete*. It often causes sores in the genital region in the form of hard-edged ulcers. These may appear up to about six weeks after infection. The sores heal by themselves, but if not treated the disease progresses. After about 12 weeks there is often a rash on the body and sometimes a little fever. After this, there may be no signs for a long time, sometimes many years. But eventually the heart, eyes, brain and other organs may become infected, and the person may become very seriously ill and eventually die. A more immediate risk is that an infected woman who becomes pregnant will pass the *Spirochete* on to her unborn baby, causing meningitis, deformities or still-birth. Antibiotics can stop the disease at any stage but they can not undo any damage which the *Spirochete* has already caused. Syphilis testing is available for any sexually active person who has genital sores or who learns that a partner is infected. The test works by looking for the antibodies to the *Spirochete* in the patient's blood. However these may not be present until about six weeks after infection. If a person thinks that he or she may have been infected with any STD, they must get treatment at once and make sure that anyone with whom they have had sexual contact also gets treated. There is no point in one partner being cured if the other is still infected!

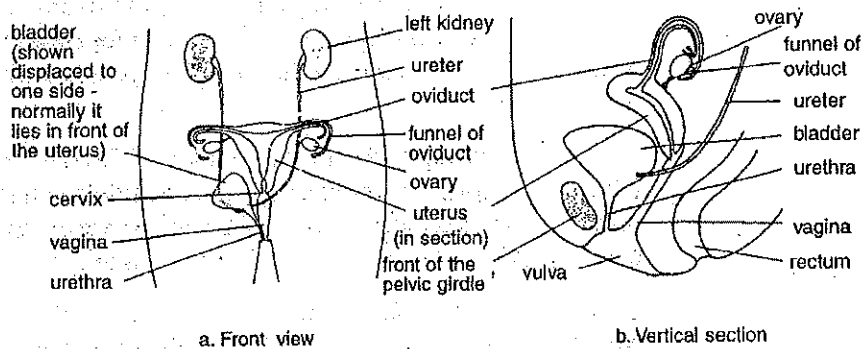


Figure 32. The female reproductive organs

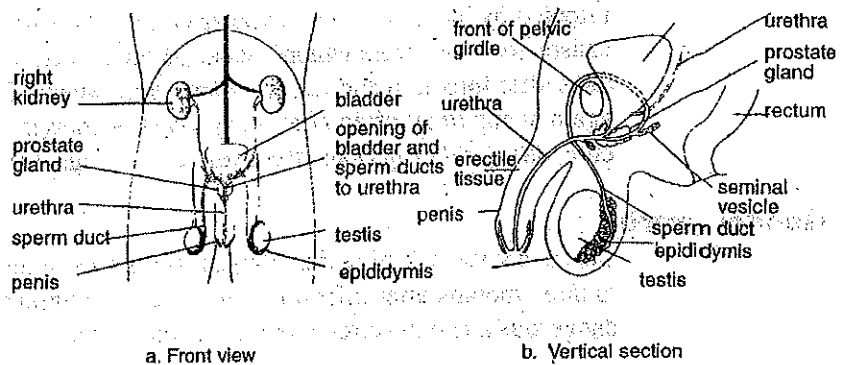


Figure 33. The male reproductive organs

Gonorrhoea

This disease is caused by a bacterium called *Gonococcus*. It thrives in moist, warm parts of the body, including the mouth and throat as well as the rectum, cervix and urethra. Genital symptoms such as burning, itching and a smelly discharge occur up to about 10 days after infection. In women, these symptoms may not be noticed and the infection can spread into the fallopian tubes and lead to infertility. Doctors can easily detect the *Gonococcus* and testing is recommended for anyone who has the symptoms or who has had unprotected sex with more than one partner. Since the *Gonococcus* can infect a baby's eyes at birth, many doctors think all pregnant women should be tested. New-born babies are often given eye drops as a precaution against the *Gonococcus*.

The disease can be cured by penicillin, but some *Gonococci* are now resistant to this. The acquired immunity of the body to gonorrhoea is very short-lived and so the disease can be caught many times.

Chlamydia

Chlamydia is a very common bacterial STD with symptoms similar to those of gonorrhoea. The most usual symptoms, which may occur anything from a few days to a few weeks after infection, are inflammation of the urethra, pain when urinating and discharge of pus or mucus. Women sometimes have a general pain low down in the belly.

Babies born to mothers with chlamydia are often infected with conjunctivitis (an eye infection), pneumonia (a lung infection) or middle ear infections. The antibiotic, tetracycline, is the usual treatment but this cannot be taken by pregnant women; substitutes are available in these cases.

Genital Herpes

This is caused by a virus and cannot be treated by antibiotics. Once infected by the *Herpes* virus you are infected for life. The virus causes sores or ulcers which appear on the genital area about 10 days after infection and last for about three weeks. They may occur again at any time, often after many years. Although there is no cure, anti-viral drugs can effectively control this disease.

Genital warts

This is a virus infection like *Herpes*. Hard, fleshy lumps appear up to three months after infection. They are more unpleasant than dangerous and can be removed in various ways.

Hepatitis B

The Hepatitis B virus attacks the liver, causing a 'flu-like illness with fever and jaundice (yellow skin and eyes and very strongly yellow urine). The disease can be severe and there is no cure. However, most people recover slowly and develop immunity to further attacks. A vaccine is available to protect us from this STD.

Are STDs a problem in the Pacific?

There is a world-wide epidemic of STDs and the Pacific has not escaped! Gonorrhoea is the second or third most commonly reported disease in several countries of the region, often only behind 'flu and diarrhoea. Table 1 shows the rates of Gonorrhoea and Syphilis for 1986 and 1987 in several island countries. In several countries these rates are similar to those of the USA where STDs are admitted to be a serious problem.

Table 2. Incidence Rates for gonorrhoea and syphilis 1986/87

| Country | Gonorrhoea | | Syphilis | |
|------------------|--------------------------|-----------------|--------------------------|-----------------|
| | Number of cases per year | Case rate /1000 | Number of cases per year | Case rate /1000 |
| Fiji | 1 428 | 2.0 | 550 | 0.8 |
| New Caledonia | 488 | 3.2 | 380 | 2.5 |
| Palau | 155 | 11.9 | - - | |
| French Polynesia | 554 | 3.2 | 27 | 0.2 |
| Guam | 468 | 4.0 | - - | |
| American Samoa | 77 | 2.1 | - - | |
| PN.G. | 22 068 | 6.4 | 8 365 | 2.4 |
| Solomons | 271 | 0.9 | - | - |
| USA | | 4.7 | | 0.1 |

Table 3. Common STDs - symptoms and effects

| Type of STD | First symptoms | Worst effect |
|--|---|------------------------------------|
| Non-Specific Genital Infection (N.G.U. and Chlamydia) | Male: Drip from penis Tingling sensation when urinating Maybe no symptoms Female: Usually no signs at all Sometimes discharge or abnormal bleeding Pelvic pain | Infertility |
| Gonorrhoea | Male: Discharges Burning urination Maybe no symptoms at beginning Female: Usually no signs at all Sometimes discharge or Abnormal bleeding Pelvic pain | Infertility |
| Genital Herpes | Male: Painful sores Blisters Painful glands in groin Female: Painful urination | Repeated Occurrence |
| Syphilis | Hard-edged ulcers in genital area Non-itchy rash on limbs Often no symptoms | Disfiguration Insanity Death |
| Hepatitis B | Initially feel a bit sick Jaundice (yellow in eyes) Vomiting and nausea Often no symptoms | Permanent Liver Damage Death |
| HIV Infection | Night sweats Weight loss Fatigue Diarrhoea Swelling in lymph glands Often no symptoms | AIDS Death |

Questions:

- ✓ Q1. What are STDs?
- ✓ Q2. Name two kinds of micro-organisms that cause STDs.
- ✓ Q3. Can STDs be cured?
- ✓ Q4. Why are STDs more dangerous to women than to men?
- ✓ Q5. Name three STDs and state what causes them.
- ✓ Q6. What should a person do if he or she thinks they have caught an STD?
- ✓ Q7. If you are treated for an STD your partner must also be treated at the same time. Explain why.

3.2 ACQUIRED IMMUNO-DEFICIENCY SYNDROME - AIDS

AIDS is an STD which is caused by a virus called the **human immuno-deficiency virus (HIV)**. This virus attacks the body's immune system so that it cannot fight off disease or cancers.

| | |
|------|--|
| A | Acquired: not hereditary but due to a virus acquired by the patient during his or her lifetime |
| I | Immuno |
| D | Deficiency: major collapse of the immune system |
| S | Syndrome: the group of symptoms that characterise a disease |
| SIDA | Syndrome d'Immunodeficiency Acquis |

Figure 34. What do AIDS (and SIDA) mean?

When the body is attacked by the virus (HIV), the immune system starts to break down. The virus attacks some of the white blood cells and prevents them from doing their work of protecting the body. The infected person then has only limited resistance to the various disease germs which he or she meets every day. He or she becomes more and more sick and is unable to recover. Eventually death follows, often from a common disease which is not serious for a healthy person.

The virus (HIV) is transmitted in **body liquids** such as blood, semen and vaginal liquids. It is quite a weak virus and cannot live for long outside the body. However, if it does enter a body, for example during sexual intercourse, it may stay there and spread without giving any signs for a very long time. The time between infection with HIV and the development of the full symptoms of AIDS may be two years or it may even be ten years! During all that time, the person may not appear ill, but he or she can infect other people.

Diagnosis and symptoms of AIDS

People who are infected with HIV usually show no symptoms for

some time. Some may have mild, 'flu-like symptoms which may be dismissed as a "cold". After a **latency** of two to ten years, during which there may be no symptoms, the following major and minor symptoms known as AIDS appear:

Major signs

weight loss greater than 10% of body weight
fever for longer than 1 month
chronic diarrhoea for longer than 1 month

Minor signs

persistent cough for more than 1 month
skin irritation
fungus infection in the mouth and throat
swelling lymph glands in neck, armpit and groin

How is the AIDS virus transmitted?

AIDS is fortunately not a very contagious disease. It is essentially transmitted only via the **blood and sexual secretions**. There are only **three** ways you can get AIDS:

1. through sex with an infected person (particularly sex without using a condom);
2. through blood from:
 - blood transfusions with contaminated blood,
 - sharing needles with infected drug users,
 - using needles for injections, tattooing, piercing ears and so on, which have been used by an infected person and not sterilized.
3. through pregnancy from mother to baby.

You positively can **not** get AIDS through normal social contacts. The AIDS virus is very weak and cannot live outside the human body. It is easily killed by disinfectants or by normal washing with soap. Figures 35 and 36 on the following pages show some of the many ways in which you can **not** get AIDS, even if you are living and working with people who have the virus (HIV). Figure 37 shows ways in which the AIDS virus can be killed.

The most common way to become infected with the HIV is through sexual contact. Blood transfusions with infected blood caused some cases, particularly before 1995. Now all blood for transfusion is carefully checked in nearly all countries including Vanuatu. However, over half those infected in French Polynesia in 1986/87 (15 out of the 29 cases) got it from blood transfusions in France before 1985.

Sharing needles among drug abusers is a major source of HIV

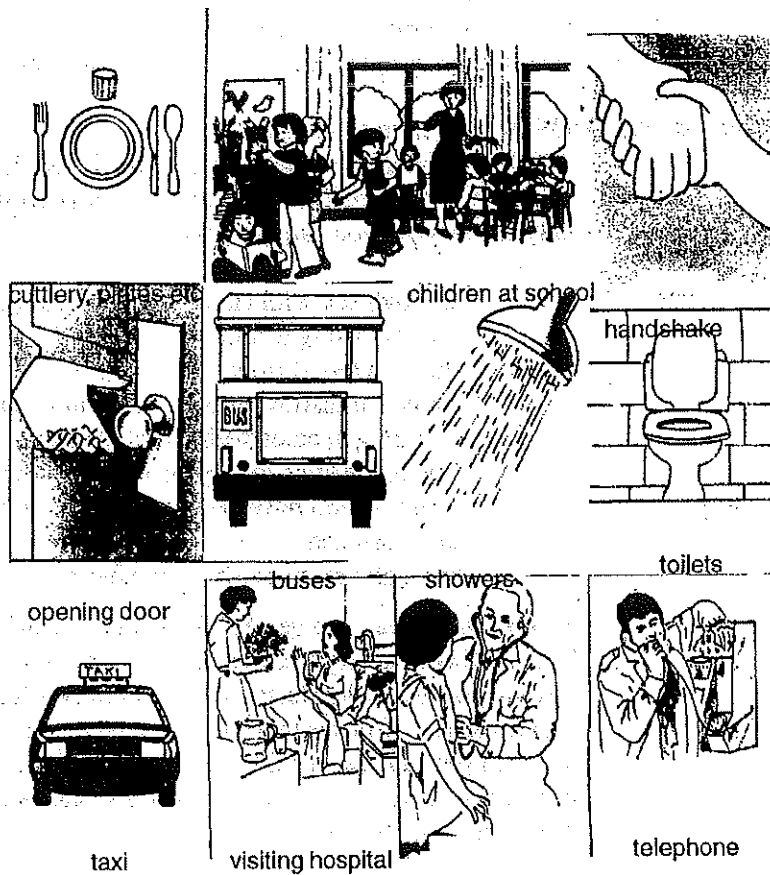
infection in countries like the USA, where drug abuse is a big problem. Transmission from mother to baby at birth is now a major cause of the disease in Africa, where more babies are being born every year with AIDS.

Who are the people most likely to get AIDS?

People with many sexual partners (homosexual or heterosexual).

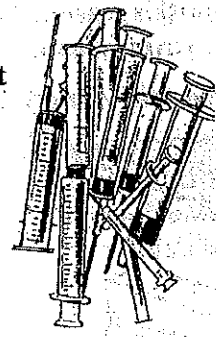
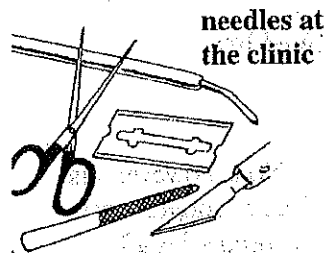
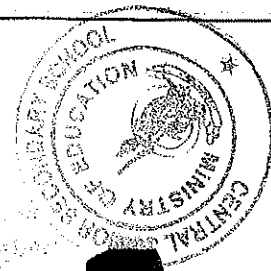
Prostitutes and their clients.

People who go to areas where there is a lot of AIDS and have sex with people they do not know very well.



Everyday contacts do not transmit AIDS

Figure 35. Ways in which you can not get AIDS



razors and scissors

These "cutting" instruments should be sterilised before each use. Simple sterilisation methods are available and should be used routinely.

These can absolutely not transmit AIDS provided certain precautions are taken.

dental instruments

Dentists are now aware of the dangers and behave with a great deal of responsibility by taking all of the necessary precautions to eliminate virtually any risk of transmission.

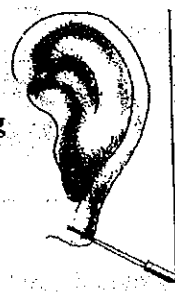
The treatments mentioned on this page should never transmit AIDS if certain elementary hygiene precautions are respected.

Any sharp or wounding instruments must be sterilised before each use. These precautions must be demanded from those providing these treatments.



tattoos

ear piercing



donating blood

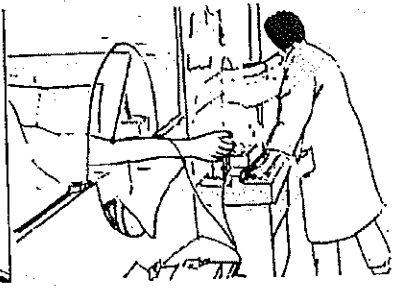


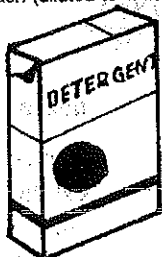
Figure 36. Taking precautions

Fortunately, the AIDS virus is not very resistant outside of the body. For this reason, it is relatively easy to inactivate it in the ambient environment.

The virus can be easily killed by:



bleach (diluted to 1/10)



Fresh hydrogen peroxide and detergents

* Note, however, that bleach solution loses its properties after a certain period. After the expiration date, it no longer disinfects.

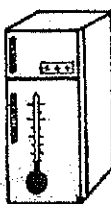


heat 60°C



70% alcohol

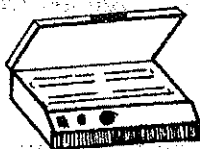
However, the virus is resistant to



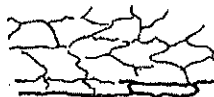
cold



gamma and X rays



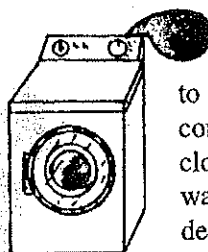
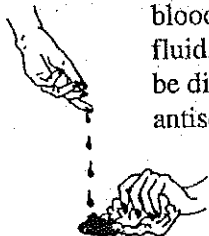
ultraviolet radiation



drying

It is therefore important

to clean immediately and disinfect any spilt blood or contaminating fluid. The wound must be disinfected with antiseptic solutions.



to wash contaminated clothes in hot water with detergents.

Figure 37. Killing the AIDS Virus (HIV)

AIDS prevention

1. Monogamy. This means having a faithful relationship where sex does not take place outside that relationship. From the Christian point of view, husband and wife must remain faithful to one another.
2. Condom. This provides an effective barrier against the transmission of HIV (and some other STDs) during sexual intercourse, providing it is used properly. It also prevents pregnancy. However, it is not 100% safe.
3. Never have an injection with a needle that is not sterilized. Do not have your ears pierced or have tattoos with needles or glass or bamboo that have been used by another person.
4. All blood from blood donors must be tested (screened) to be certain the HIV is not present.

Why is AIDS spreading so quickly?

Researchers believe that the virus (HIV) which causes AIDS has been around since the 1970s. In the 70s and early 80s, before the disease was recognised, people who were infected were spreading the disease without knowing it. Even now, this is still happening because of the long **latency** of the disease.

Latency means the time between catching the germ which causes a disease, and the appearance of the symptoms of the disease. For most diseases, this is a few days or sometimes a few weeks. But in the case of AIDS, a person may be infected with the HIV but have no symptoms for two years or more. Sometimes the disease may take as much as ten years to appear. During all this time, an infected person may appear perfectly well and may not even know that he or she has got the deadly disease. But all the time he or she is passing it on to his sexual partners.

The number of AIDS cases has risen so rapidly in recent years because people infected in the past are only now becoming ill with the disease. In one African city, soon after the first case of AIDS was discovered, all the prostitutes were tested for the virus. It was found that over half had the HIV in their blood!

For every case of AIDS which we know about, there are probably 50 to 100 people who already have the HIV in the latent stage but do not yet have the symptoms of the disease. Most of these people will eventually become ill and die of AIDS. Figure 38 shows that a country with 100 cases of AIDS today will probably have 500 to 1,500 new cases in only five years' time. Figure 39 shows how the number of known cases of AIDS in the world was climbing during the 1980s. It is expected to continue climbing in the future.

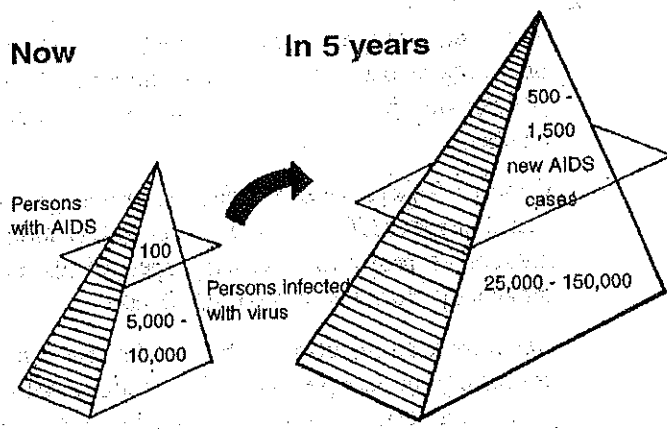


Figure 38. The increase of AIDS cases over time

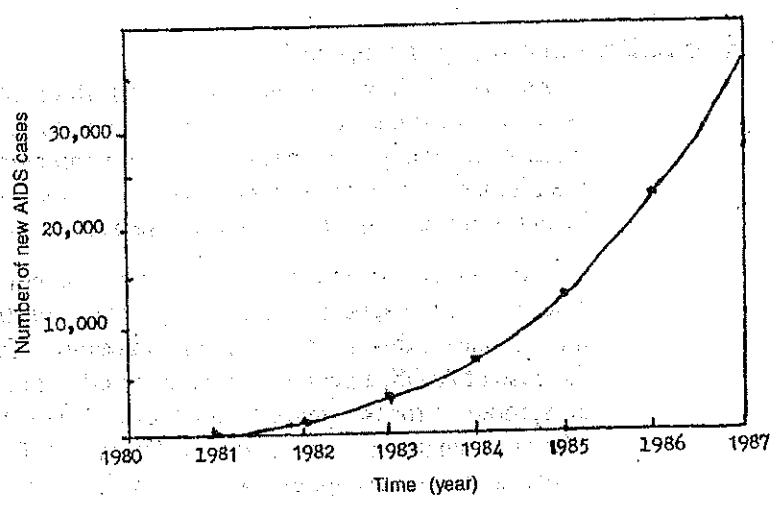


Figure 39. Number of new AIDS cases reported world-wide

There is still no cure for AIDS, although medical scientists are trying hard to find one. Until and unless they succeed, the best weapon we have against AIDS is education! If people understand about AIDS and how it is transmitted, they can change their habits and avoid this deadly disease.

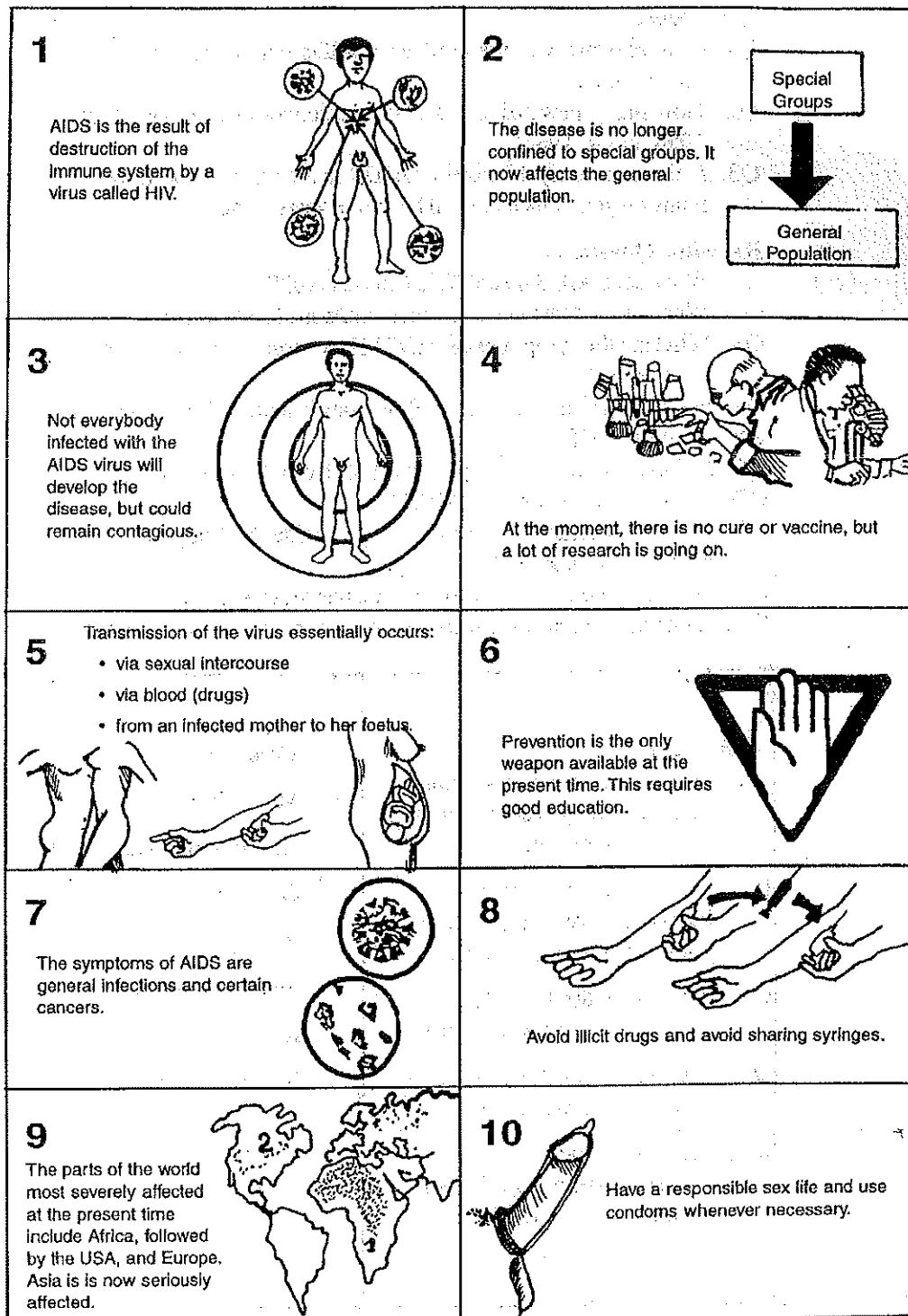


Figure 40. Ten important points about AIDS

Questions:

- ✓ Q1. Give reasons why the number of AIDS cases has risen in recent years.
- ✓ Q2. How many new AIDS cases were discovered world-wide in 1984 and in 1986?
- ✓ Q3. If there are only 10 cases of AIDS in a country now, how many do you think there will be in five years' time?

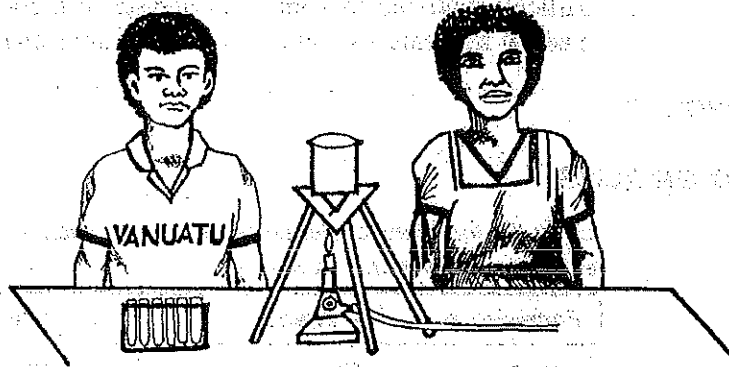
Revision Questions:

- ✓ Q1. What does AIDS mean? What causes AIDS?
- ✓ Q2. What are the three ways in which AIDS is usually transmitted?
- ✓ Q3. What are the symptoms of AIDS? How soon after infection do they occur?
- ✓ Q4. What is meant by *latency*? How does it help AIDS to spread?
- ✓ Q5. Who gets AIDS?
- ✓ Q6. Is there any danger of getting AIDS from donating blood?
- ✓ Q7. Is there any vaccine for AIDS?
- ✓ Q8. The AIDS virus does not live long outside the body. In what ways can it be killed?
- ✓ Q9. Which country in the Pacific Region has most AIDS cases?
- ✓ Q10. Match the descriptions in column A with the words in column B.

| Column A | Column B |
|---|----------------|
| A. hard-edged ulcers in genital area, non-itchy rash on limbs; often no symptoms. | M. AIDS |
| B. night sweats, weight loss, diarrhoea, swelling of lymph glands, often no symptoms. | N. gonorrhoea |
| C. this attacks the liver, causing a 'flu-like illness and jaundice | O. virus |
| D. responsible for the defence of the body against pathogens | P. syphilis |
| E. stops the growth of disease-causing organisms in wounds, e.g. penicillin | Q. hepatitis B |
| | R. antiseptic |
| | S. antibiotic |

CHAPTER 4

HEALTH AND HYGIENE



If we all took more care to:

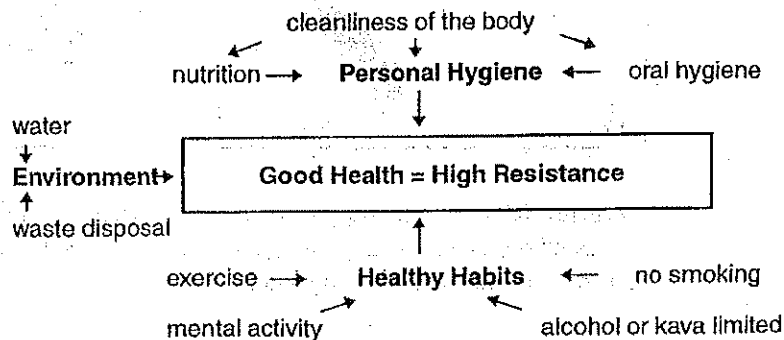
- eat well,
- keep ourselves, our homes and our villages clean,
- be sure children are vaccinated and get more physical and mental activity,

we could stop most diseases before they start!!

Our ability to fight off diseases (**resistance**) is improved if we keep our bodies fit and healthy.

Remember - prevention is better than cure!!

Here is a summary of the areas to be covered in this section:



4.1 PERSONAL HEALTH AND HYGIENE

Nutrition

Eating well is one of our best ways of preventing diseases. In Year 9, we studied nutrition and learned that our bodies need food with particular nutrients to work, grow and stay healthy. All foods are made of nutrients and fall into one of the three main food groups.

ACTIVITY 7

FOOD GROUPS

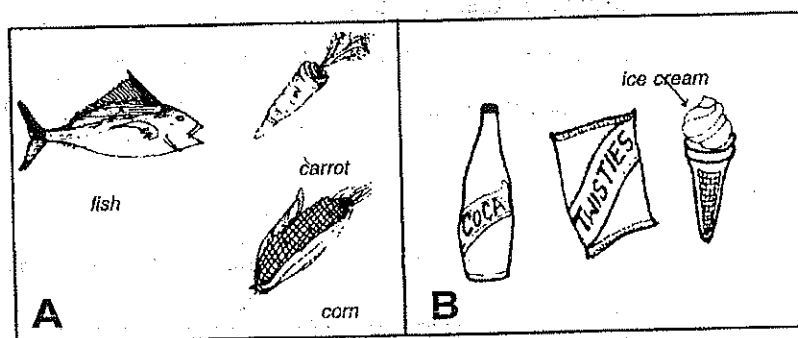
Copy the following table. Draw lines from each food group to the correct nutrients and examples.

| Food Group | Nutrient | Examples |
|---------------|---------------------|-------------------------|
| Energy | Carbohydrates, fats | kumala, yams, butter |
| Body-Building | Proteins | meat, eggs, beans |
| Protective | Vitamins, minerals | pawpaw, oranges, greens |

ACTIVITY 8

A BALANCED DIET

A balanced diet means eating the right amounts of the right kinds of food everyday. Discuss which of the following two lunches would be better for you and why.



Malnutrition means **not** eating the right amounts of the right kinds of foods every day. This can be due to either a lack of food or too much food of the wrong kind.

Deficiency diseases occur when too little food, or too little of a particular nutrient, is eaten.

ACTIVITY 9

DEFICIENCY DISEASES

Fill in the blanks of this table to test your knowledge of deficiency diseases caused by a lack of certain vitamins and minerals.

| Nutrient | Good Sources | Needed In the Body for | Deficiency Disease |
|--------------|--------------------------------------|---|--------------------|
| Vitamin ____ | milk, butter | good vision, skin growth | _____ |
| Vitamin D | milk, eggs, sunlight | _____ | Rickets |
| Vitamin B1 | whole grains, brown rice, vegetables | proper function of heart, stomach, nervous system | Beri-Beri |
| _____ | red meat, liver, (sard) cabbage | healthy red blood cells | Anaemia |
| Vitamin C | _____ | resistance to infection | _____ |

Underweight describes an individual who does not weigh as much as is recommended for his or her height. This usually occurs in places where there is not enough **energy** food available. This can be identified in children by looking at their Health Record Card. A child whose weight is below the red line is underweight.

If someone is underweight the following problems may be seen.

In children:

- failure of a child to grow
- failure of a child to grow or gain weight normally
- slowness in walking, talking, or thinking
- swollen bellies, thin arms and legs
- sadness, lack of energy
- swelling of feet, face, and hands
- thinning or loss of hair

In anyone:

- weakness and tiredness
- anaemia
- painful or sore tongue
- loss of appetite
- sores in the corners of the mouth
- burning or numbness of the feet

Even though there is plenty of food in Vanuatu, many children are underweight. Most likely this is due to eating an unbalanced diet. A child fills up on bananas or root crops and does not have enough room left to eat protein foods or fruits and vegetables. Also, the time between meals may be too long.

Malnutrition is often most severe in children, who need lots of nutritious food to grow well and stay healthy. There are two common forms of severe malnutrition.

One is caused by the child not getting enough of any kind of food, but especially energy foods (carbohydrates and fats). The child's body is small, thin and wasted. He is little more than skin and bone. He needs more food, especially energy food.

The second kind of severe problem is caused by a child not getting enough body-building foods (protein). He may look somewhat fat, but he has very little muscle. He is little more than skin, bones and water. This child needs more foods rich in protein.

Being underweight is a problem in Vanuatu. We must be especially careful to make sure that children get enough protein foods. Children in Vanuatu usually have enough energy foods.



This child needs more protein.



This child needs more of everything.

Another type of malnutrition is obesity (being overweight). This describes an individual who is 15kg or more over their recommended weight for their height. This extra weight is most often due to eating too

much "rubbish food", for example, ice cream, coca cola, lollies, sweet biscuits and cakes. Even eating too much rice, bread, or root crops can cause a person to become overweight. Obesity can lead to:

| | |
|---------------------|----------------------------|
| high blood pressure | gall stones |
| heart disease | diabetes |
| stroke | arthritis in legs and feet |

In Vanuatu there are people who have high blood pressure which can damage other parts of their bodies like the heart and kidneys. To avoid this, overweight people should lose weight by reducing the amount of sweet, starchy and fatty foods that they eat.

Questions:

- ✦ Q1. What foods should you cut out if you are overweight?
- ✓ Q2. What foods could you continue to eat plenty of even if you are trying to lose weight?
- ✓ Q3. Other than reducing the amount of food you eat, what else do you need to do to lose weight?
- ✓ Q4. Why do you think many people in developed countries are overweight?
- ✓ Q5. Vanuatu is getting more machines to do work; for example, gardening tools, electrical tools, and many machines for transport. Also, many stores are now selling packaged foods. What effects might this have on the children and adults of Vanuatu?

Keeping food clean

Eating healthy foods is important. The way we store and prepare food is equally important.

More than half of all diseases and deaths among children are caused by germs which get into the children's mouths in food or water.

Here are some rules to keep food clean.

1. Wash your hands many times a day, especially after going to the toilet and before handling food.
2. Keep food clean, covered, and away from flies, rats, mice and other animals.
3. Surfaces on which food is prepared must be kept clean.



4. Utensils and food preparing surfaces should be cleaned especially well after preparing raw meats and fowl. These foods often contain many germs.
5. Before eating fruit, wash it very well, especially fruit that has fallen to the ground.

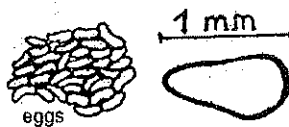
ACTIVITY 10 HOW FLIES HARM FOOD

You will need:

- 2 shallow dishes with netting to cover them
- some vegetable or meat scraps

1. Place some of the vegetable or meat scraps into one of the dishes and cover it with the netting. This will make sure no flies can get to the scraps.
2. Place other scraps in the second dish and leave it uncovered.
3. Put both dishes in a place where the flies can find them.
4. You should check your dish everyday. Here is what you should observe.

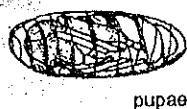
Almost immediately a single fly will lay about 120 eggs in the vegetable or meat scraps (they will also lay eggs in animal dung)



Within 6-8 hours the eggs hatch into larvae (maggots) which are little whitish creatures. (If you can see these maggots in the uncovered dish, cover it with the netting. If not, leave it uncovered.)



After feeding on refuse for about 5 days, the larvae change into pupae.



pupae



In 5 to 6 more days the pupae change into adult flies.

From the above activity, you will see that houseflies do breed in and on scraps of food. Houseflies also breed in manure, and feed

on dirt and dung. Germs of typhoid fever, cholera, and dysentery are passed in our faeces. Flies can carry these disease germs from faeces to food. Remember that the legs of the fly are covered with many hairs. Germs stick to these and are transferred to food when the fly sits on it.

Flies are therefore great enemies of mankind and efforts should be made to get rid of them. This is very difficult because flies breed so rapidly.

Questions:

- ✦ Q1. Why are flies good disease carriers?
- ✦ Q2. What are three ways you can prevent flies from spreading germs?
- ✦ Q3. Why is it important to wash your hands before and after handling food? What about after going to the toilet?

Cleanliness of the body

Cleanliness of the body is essential for good health. The sweat glands in the skin help to relieve the body of some of its waste materials. If the sweat glands are blocked by dirt, they are not able to function. This makes extra work for the lungs and kidneys to try to get rid of body wastes. Also, the blocked glands in the skin form places where disease might start. Cleanliness of the skin is also important for the regulation of body temperature.

To keep the sweat glands open and avoid diseases of the skin we must follow some basic guidelines of personal hygiene.

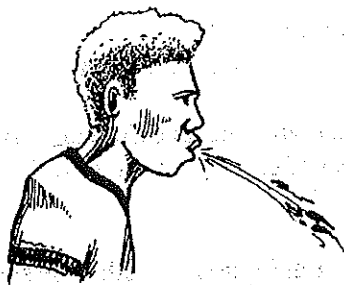


1. **Wash your hands often!!!**
especially in the morning, after going to the toilet, and before eating or handling food.

2. **Bathe every day!!!**
Bathe after working hard or sweating. Frequent bathing helps to stop skin infections, pimples, itching and rashes. Sick people should also bathe daily.

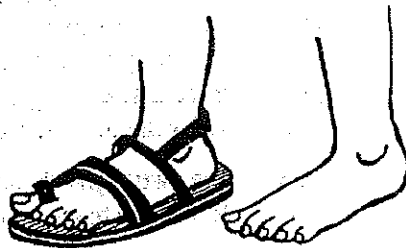


3. **Wash clothes regularly.**
Also wash bed-sheets and towels often. Hang them in the sun, along with mattresses and pillows.



4. **Don't spit on the floor**
Spitting can spread diseases. When you cough or sneeze, cover your mouth with your hand or a piece of calico. Then be sure to wash your hands.

5. **Wear slippers to protect your feet from stepping on sharp objects which could cause infections. Also, do not go barefoot in areas close to the house; hookworm may be present in the soil there!**



6. **De-louse the family often.**
Keep hair washed and cut short. Lice and fleas carry disease. Don't share haircombs or sleep on others' pillows.

* **Questions:**

- Q1. Why is it important to keep fingernails cut short?
Q2. While walking on the reef, you cut your foot on a piece of coral. What steps can you take to keep it from becoming infected?

Oral Hygiene

Oral hygiene means keeping our mouth, teeth and gums clean and healthy.

Keeping our teeth and gums clean is important for many reasons:

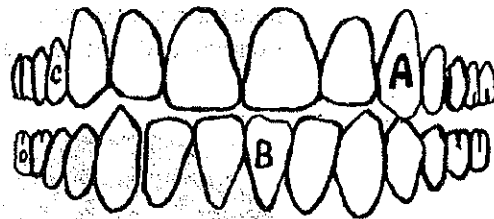
1. **Good health.** Infection from a bad tooth can spread to other parts of your body.
2. **Good speech.** Your tongue and lips touching the teeth help you to speak.
3. **Good eating.** Your teeth break food into small pieces so that you can swallow and digest better.
4. **Good looks.** Healthy teeth make you look good and feel good.
5. **Good breath.** If you leave food on your teeth, your breath will smell bad.
6. **Healthy gums.** Gums fit tightly around the teeth and help to keep them strong. Without strong gums, your teeth are of no use.

In Year 9 you studied teeth when you learned about digestion. Revise that information by completing Activity 11.

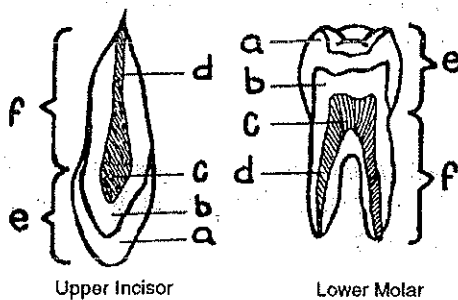
ACTIVITY 11 DIFFERENT KINDS OF TEETH

Using the letters as written on the teeth in the diagram, match the type of tooth with the following names:

Incisors, Molars, Premolars, Canines.



Here is a diagram showing the structure of the tooth. Revise this and remember what you learned last year about each of the structures.



- Key**
- a. enamel
 - b. dentine
 - c. pulp
 - d. nerves and blood supply
 - e. crown
 - f. root

Questions:

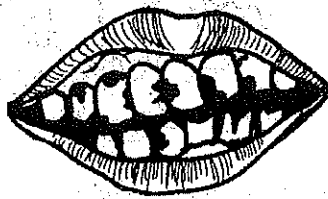
- ✓ Q1. Which part of the tooth is the hardest?
- ✓ Q2. What are the differences in the structure of an incisor and a molar?
- ✓ Q3. Which kinds of teeth chew and grind food into small bits?
- ✓ Q4. How many milk teeth does a 5 year old have in his mouth?
- ✓ Q5. How many permanent teeth does a 22 year old have in her mouth?
- ✓ Q6. What holds the teeth in the mouth?

How diet affects the teeth

Eating a well balanced diet not only keeps your body healthy but also keeps your teeth and gums healthy. Foods from your gardens and local food from the market are best. Foods from the store often contain processed sugar. This can cause holes in your teeth because these sugars form acids with the bacteria in your mouth.

Everyone has bacteria in his or her mouth; some are good and some are harmful. We do not need to get rid of all the bacteria. What we must try to do is to keep the bacteria from forming a film called **plaque**. Plaque is invisible, but we can feel it as the "furry film" on our teeth when we wake up in the morning.

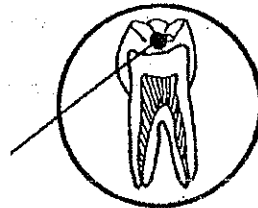
Plaque is made of living micro-organisms (bacteria). Like all living things they must take in food and excrete waste products. In the mouth, the food the bacteria like best is sugar! After eating sugar, the bacteria excretes acid. The acid can make holes in your teeth.



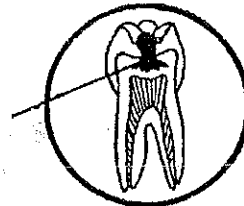
PLAQUE + SUGAR = ACID

ACID + TOOTH = HOLES

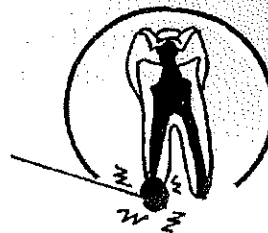
A small hole, that is in the enamel only, can be filled by a dental worker before it causes too much pain. If it is not filled, the hole will become bigger and deeper.



A hole that reaches the dentine will quickly spread to the nerve. The tooth aches, even when you try to sleep.



Infection can pass from the tooth to the bone. As it spreads under the skin, there may be swelling of your face, and a gum bubble or tooth abscess will occur. Sometimes the only cure is to remove the tooth.



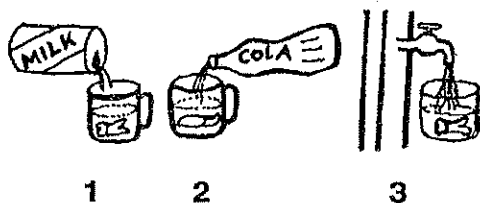
ACTIVITY 12

THE EFFECTS OF SUGAR ON TEETH

You will need:

- 3 extracted teeth (Get these from a hospital or dental clinic or milk teeth from a younger brother or sister. Teeth from an animal will also work.)
- 3 small jars with lids and some cola, milk, and water

1. Put one tooth in each jar.
2. As shown in the diagram, pour milk over one, cola over one, and water on the last one.



3. Cover the jars loosely with lids to keep out ants and flies.
4. Leave them for a few days then take out the teeth and compare them.
5. Answer the following questions about your observations.
 - a. Which one of the teeth became darkest?
 - b. Scrape the roots with a knife. Which one became the softest?
 - c. What does this tell you about the effects of sugar on teeth?

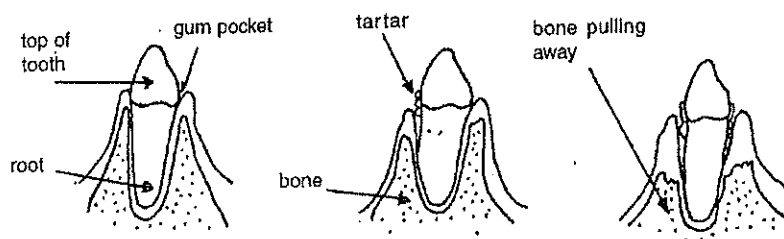
Plaque not only leads to holes in the teeth, but it is a major cause of **gum disease**.

Bleeding gums may be a sign that the cleaning of your teeth is not good enough. Plaque which is not removed thoroughly will irritate the gums and cause pockets to form around the tooth. Bacteria and food collect in the gum pockets and make acid. This makes the gums sore (as well as making holes in the teeth).

Plaque that is not removed hardens and sticks to the teeth as a substance called tartar. Tartar helps plaque to form, thereby causing more infection. The gums want to "get away" from the infection so

they pull away and the pockets become deeper. The bone pulls away too and then it no longer holds the tooth well. The tooth becomes loose and may fall out or need to be pulled out.

Gum disease is often painless, but it is the major cause of tooth loss after the age of 35.



Questions:

- ✓ Q1. Tooth decay causes more loss of teeth in students and in children in towns than it does in villages. Give some reasons for this.
- ✓ Q2. Why do we need to remove plaque from the teeth everyday?
- ✓ Q3. Why does a small hole usually not cause much pain, but a big hole does cause pain?
- ✓ Q4. Why do antibiotics work to reduce swelling from a tooth abscess ?

Prevention of decay and gum disease

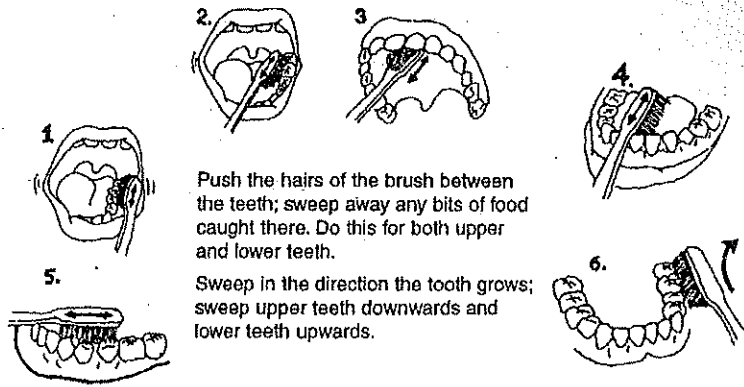
To keep our teeth for our entire life we must prevent tooth decay and gum disease. Listed below are some of the ways that you can take care of your teeth and prevent holes and gum disease.

1. **Avoid sticky and sweet foods.** These feed the bacteria so they make more acid .
2. **Chew foods like sugarcane, coconut, corn or pandanus** to keep your teeth and gums healthy.
3. **Brush your teeth after every meal and before bed.** Cleaning teeth requires time and care. If you hurry you will leave food and bacteria behind, and they will continue to make holes and sore gums. If toothpaste is not available, water alone is enough.

A soft toothbrush is best, but must be changed a couple of times each year. Scrub the grooves on the tops of the teeth, between the teeth, and the inside and outside of each tooth as follows:

Proper toothbrushing

Scrub the outside, inside, and top of each tooth carefully.



Push the hairs of the brush between the teeth; sweep away any bits of food caught there. Do this for both upper and lower teeth.

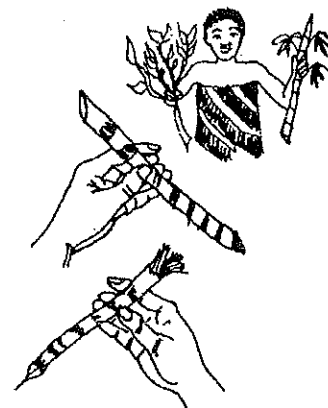
Sweep in the direction the tooth grows; sweep upper teeth downwards and lower teeth upwards.

When you finish brushing, feel around your teeth with your tongue to make sure they feel smooth and clean. Brushing your teeth should take about two minutes! If you finish in 30 seconds, you surely have not done a thorough job!

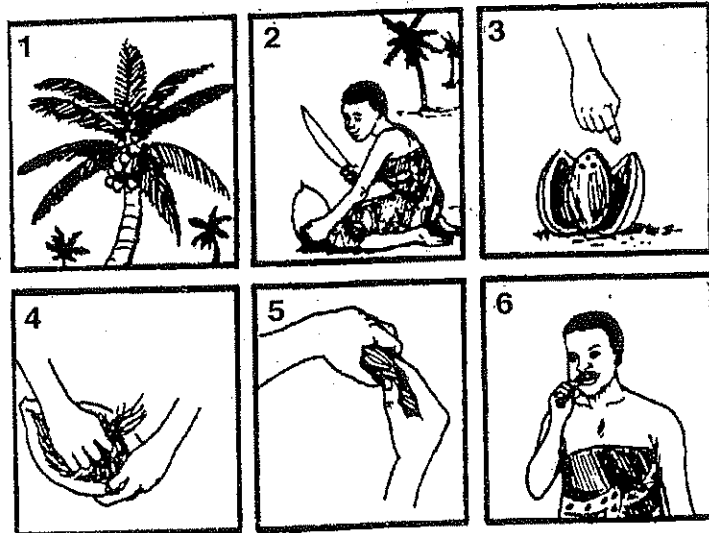
It is better to clean your teeth carefully once every day than to clean poorly many times a day. You should also clean in between your teeth with dental floss, or some cotton wool, or even a spine from a coconut broom. If you do not have a toothbrush, you can make one using local materials.

How to make a toothbrush with local materials

1. Use a small branch, young bamboo, strong grass or the skin from sugarcane or betel nut.
2. Cut a piece that is still green and soft.
3. Chew one end to make it stringy like a brush.
4. Sharpen the other end so it can clean between the teeth.



Another way to make a toothbrush is to use the fibre from inside a coconut husk. You can twist some of the fibre into a kind of brush. First rub it and shake away the loose bits. Then use the end to clean your teeth, as shown in the following pictures.



4.2 ENVIRONMENTAL HYGIENE

The water supply and health

A safe water supply is essential for the health of any community, village or town. You learned about this in the Year 7 booklet "Water in our Lives". To be healthy, people need clean water for drinking, preparing and cooking food, washing the body and their clothes.

We are all aware of the necessity of water in our lives, but contaminated water can cause disease and suffering. The biggest killers in the world today are diseases caused by dirty water and improper waste disposal. About 80% of all diseases in the world are caused by:

1. polluted water; 2. shortage of water; 3. poor sanitation.

Water-related diseases can be divided into the following classes:

A: Diseases carried by water

Examples - Germs in water cause diseases such as Hepatitis A, Cholera, and Typhoid.

Preventative methods -

- Improve water quality.
- Use a different source.
- Use latrines.
- Educate about health.

B: Diseases associated with shortage of water

Examples - Diseases due to poor personal and public cleanliness include diarrhoea, scabies, skin and eye infections, worms and leprosy.

Preventative methods -

- Improve quantity of water.
- Educate about health and hygiene.

C: Diseases associated with water and sanitation problems

Examples - Germs that spend part of their lives in water, faeces, or moist soil include hookworm.

Preventative methods -

- Reduce contact with water.
- Improve water quality.
- Educate about health and hygiene.

Class: Insect-carried diseases

Examples - Mosquitoes and insects breed and bite near water; they are vectors for malaria and dengue fever and other diseases.

Preventative methods -

- Control insect breeding and biting.
- Drain ponds.
- Use mosquito nets.
- Educate about health and hygiene.

How to keep the water supply safe

This section revises some of what you learned in Year 7 about keeping water clean and using latrines, so that the water does not become contaminated.

Clean water should come from a protected tap, spring, well, or bore-hole. Water for drinking from any other source should first be treated to make it safe, either by boiling or chlorination. Vessels for storing or carrying water must be kept clean as well.

Latrines should be downhill, and more than 20 metres away from the water supply and house. Every member of the household should use them. Latrines must be kept clean by washing the floor and slab often. Materials for personal cleaning should always be available (leaves, paper, water and soap for washing hands).

The pit should be covered when the latrine is not being used. It must be emptied or a new one must be dug when it is full. You can control smells by putting ashes over the wastes.

The diagram on page 75 shows an example of what happens when

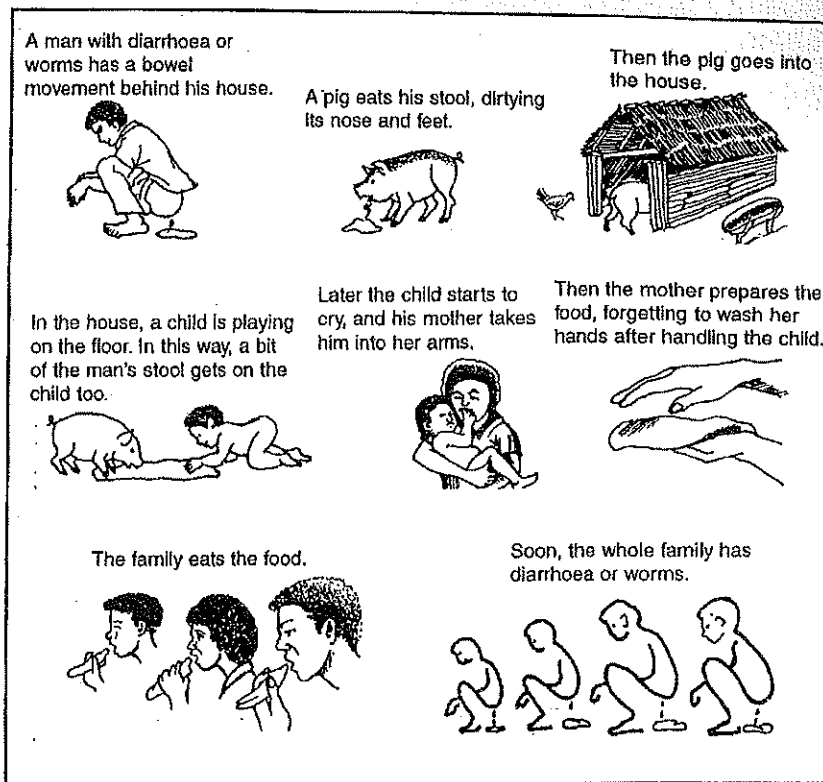
latrines are not used and people leave their faeces in the wrong places. The method of disease transmission, as shown in the diagram, is called **faecal/oral transmission**. This means that faeces pass to the mouth by hands which have come in contact with faeces. Faeces carry many different disease organisms, especially worms and bacteria which can cause diarrhoea.

Diarrhoea means loose or watery stools which are passed from the bowels frequently, often many times a day. Diarrhoea can be dangerous because the body loses more liquid than it takes in. The result is dehydration. Dehydration can happen to anyone, but it is most dangerous in small children.

Someone who has severe diarrhoea, causing dehydration, shows several symptoms such as: dry mouth, little or no urine being passed, and skin which loses its stretchiness.

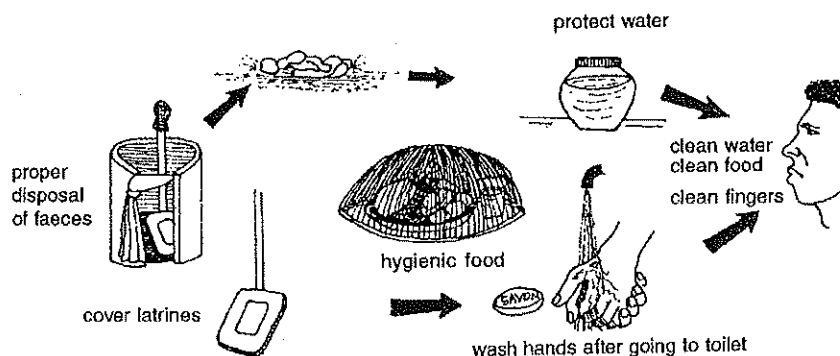
Diarrhoea and dehydration are problems in Vanuatu mostly due to faecal/oral contamination, or contamination of the water source. Diarrhoea can lead to malnutrition and in severe cases dehydration can lead to death. Dehydration can be avoided by giving large amounts of liquids (water, tea, soup, or coconut water) when a person starts having diarrhoea. It is especially important to give small children plenty of fluids from the very start of their having watery stools.

What happens when you do not use the latrine!



Prevention of diarrhoea and dehydration

Prevention of diarrhoea depends on breaking the faecal/oral transmission cycle. Some simple rules of personal hygiene should be followed as shown in the diagram below.



Questions:

- ✓ Q1. List at least five ways in which the transmission of diarrhoea could have been stopped in the diagram about the man, the pig and the baby.
- ✓ Q2. List ways to carry and store water safely from a village well.
- ✓ Q3. Why is filtration of pond water not enough to make it safe to drink?
- ✓ Q4. Prevention of most water-related diseases can be achieved through the use of latrines and health education. Explain why this is true.

Disposal of waste

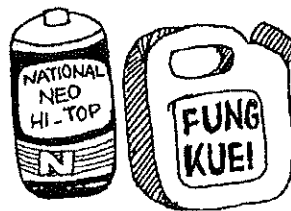
We have seen that waste can be a problem in causing disease. Flies can breed in it and carry germs to us. Also, waste can make our villages look dirty. If tins are left lying around, they will give places for mosquitoes to breed. Broken glass can be a hazard too.

Rubbish must be taken care of properly. It should not all be thrown away into one pile. Some rubbish can be made into compost and become useful as fertiliser for the garden. Some items can be burned, while others must be buried.

1. **Burning** - Small paper items and cartons can be burned away from the village to avoid problems of smoke and smell. The ashes can be put down the pit latrine to stop the smell, or on top of the compost heap to stop the flies.

Do not burn batteries! Batteries can explode if they are burned so they should be buried.

Most plastics should not be burned because they put harmful gases (pollutants) into the air. Plastics should be buried.



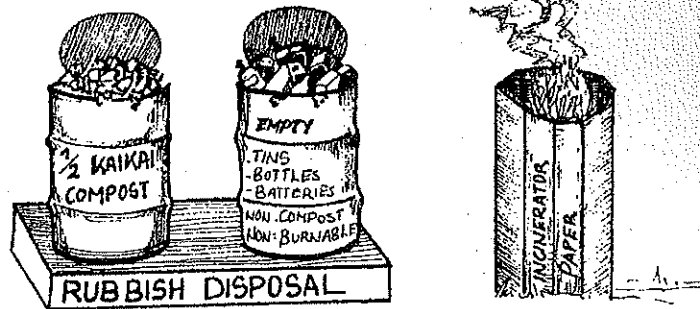
DO NOT BURN

2. **Burying** - Tins, bottles, batteries, and plastics should be buried in a pit at least 100 metres downwind from living areas and water sources.

Tins should be opened at both ends and be crushed so they will take up less space and will not provide breeding sites for mosquitoes. A large drum outside the house can be used to collect items to be buried and this can be taken to the pit every week.

3. **Composting** - Organic waste from plants and animals, including leaves, vegetables, fruit, roots, fish bones and meat can be put into a separate hole or heap and mixed with soil to become compost. Wood ashes, human and animal faeces can be included in the heap. Make sure the waste is always covered by 2-3cm of soil or ashes.

Compost materials can be kept in a covered drum behind the house and carried to the heap every week. You have learned how to make a proper compost heap in your agriculture class, but ask an agricultural extension worker for advice if needed.



Questions:

- Q1. What is the role of decomposers in making compost out of organic matter?
- Q2. Why is it important to cover the compost heap with soil every time you place food scraps or other waste on it?

Habits and decisions for a lifetime

What is a habit? A habit is something which we do regularly. A habit becomes so much a part of us that we do it without thinking. We often learn our habits from our friends or from other people. Hopefully, washing your hands and brushing your teeth have become habits. Unfortunately, some people decide to start habits which can be deadly. Once the habit is started, it is hard to stop. But we will look first at healthy habits.

Healthy habits

1. Exercise: what do we know about it?

The body needs frequent and vigorous exercise. It must be vigorous enough to change the pulse and breathing rates. Joints should be exercised to keep them flexible, and muscles grow stronger with use. Your muscles will become weak without exercise.

During exercise many things happen to our bodies:

- a. our nerves stimulate our muscles to contract and relax;
- b. our muscles use more fuel (from food) and oxygen (from air);
- c. our muscles produce more carbon dioxide, water, and heat;
- d. our hearts pump faster, speeding up the circulation of the blood to provide more fuel and oxygen to the muscles, and to remove the extra waste products;

- e. our lungs work harder to provide more oxygen and to remove carbon dioxide;
- f. as waste products build up, our bodies start to feel tired.

When exercise stops, our hearts and lungs continue to work faster to restore the balance of fuel, oxygen and waste.

Exercise keeps the body in good working order in the following ways.

It

- a. keeps our joints flexible
- b. makes our muscles strong;
- c. keeps our weight down;
- d. keeps our heart blood vessels and lungs in good order;
- e. makes the body feel tired so that we sleep better;
- f. it generally makes us feel fit and well.

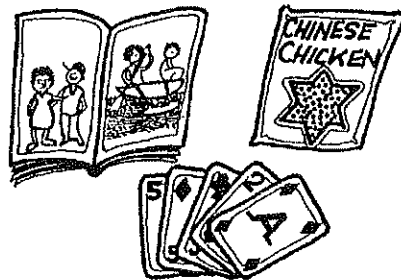
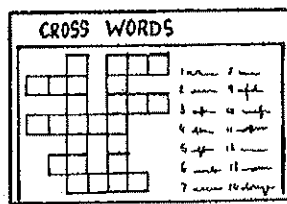
A physically healthy body makes us feel good. In Vanuatu most children



get plenty of exercise working in the gardens, playing sports and keeping school areas clean.

Exercising our minds is also important. Reading books, talking with others, playing thinking games and learning new things all help keep our minds busy.

“An idle mind is the devil’s workshop.”



2. Rest and sleep

The body is functioning all the time, even when we are resting or sleeping. The cells of the body need a continuous supply of oxygen and fuel. Waste products such as carbon dioxide and water must be constantly removed. During rest or sleep, the cells are fed and become ready for further activity; we no longer feel tired. Without sleep the body becomes exhausted.

During sleep, several things happen to our bodies:

- a. our pulse rate falls (our heart beats slower);
- b. our body temperature drops;
- c. our muscles relax;
- d. our blood pressure falls;
- e. we dream.

In recent years, scientists have learnt a lot about sleep. We now know that there are different levels of sleep and that the brain continues to work. Sometimes the eyes move quickly from side to side. These are called rapid eye movements (REM). They happen when we are dreaming. Dreaming is very important. If you are woken up all the time during REM times, you may feel as though you have had no sleep. Everyone dreams but you do not always remember the dreams.

The amount of sleep needed is different for everyone. Babies, of course, need the most. They need up to 16 hours a day at first. Young

children need more than adults and teenagers. You should try to get between 7 and 9 hours of sleep each night. Old people need a little less sleep, maybe 6-7 hours per night.

ACTIVITY 13 **FAVOURITE EXERCISES IN YOUR CLASS**

You will need: • *your classmates!*

1. *Make a tally chart on the board like the one below.*

Football Walking Dancing
Volleyball Running Swimming
Netball Basketball Others

2. *Survey your class with a show of hands. Each student raises his/her hand only once to vote for his/her favourite activity.*

3. *With the information from the board, make a bar chart of the results of your survey.*

Unhealthy habits

Some habits can be very dangerous for your health. They may even decrease the length of your life. These include smoking, and drinking too much alcohol and kava.

1. Smoking:

When you studied the respiratory system during Year 9, you learned that when we breathe in, air passes through the nose and mouth, into the trachea (windpipe), through smaller air tubes (bronchioles), and then into small air sacs (alveoli) in your lungs. The oxygen that our body needs crosses into the blood and the waste gas, carbon dioxide, is breathed out.

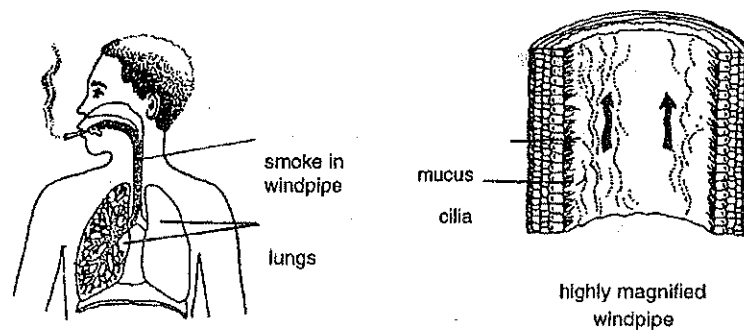
If a person smokes, the whole delicate system is damaged because of the harmful substances in the tobacco smoke:

- a. nicotine .. causes the heart to beat at a faster rate;
- b. tar .. lines the tubes which lead to the lungs;
- c. carbon monoxide .. affects the ability of the blood to carry oxygen;
- d. bits of burned tobacco .. irritate the delicate lining.

There are other effects of smoking on the lungs and body as well. Normally, the trachea is lined by tiny hairs (or cilia) which move backward and forward. Over the cilia is a sticky liquid which is called mucus. The mucus traps tiny pieces of dust and dirt which are in the air. The cilia move the mucus upwards (more than 1 cm every minute). Eventually, the mucus reaches the throat where we

swallow it. (Remember! Don't spit it out on the floor. Saliva can pass disease from one person to another.)

If smoke passes into the air tubes, it will cause the cilia to slow down their movement and eventually stop. They may become covered with tar. The mucus no longer passes upwards and therefore drops into the air sacs. The smoker then has to cough to get rid of it. A person who smokes a lot often has a bad cough. He may eventually develop a disease called bronchitis. This is when the air tubes become infected and swollen.

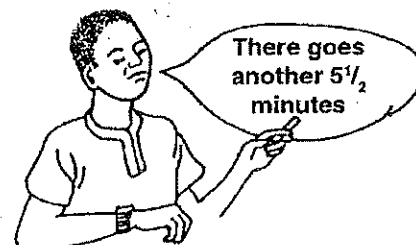


Smoking just one cigarette causes the skin temperature to drop, the heart to beat faster, and the blood pressure to rise. You can understand from this information that smoking can have a serious effect upon a person's health. Lets go over the facts.

If you smoke for many years you are likely to become ill. You can shorten your life by 10-15 years! On average, a smoker shortens his life by more than 5 minutes for each cigarette he smokes.

If a pregnant woman smokes she affects the growth of her baby. Nicotine and carbon monoxide pass into the baby's blood from the mother's blood. The baby has no choice! It is likely to be smaller, less well developed and with less resistance to disease when it is born.

In families where parents smoke, the children are more likely to have diseases which affect their breathing.



If teenagers begin to smoke, they are affected as much as adults. They get more coughs, colds, and shortness of breath. Smoking spoils athletic ability too.



Smoking damages the sense of taste and smell. Food does not taste as good.

Smoking makes teeth go yellow. Clothes, hair and breath smell of smoke and ash.

People who smoke are more likely to suffer from heart disease. It may cause sores (ulcers) in our stomachs, or make them worse.



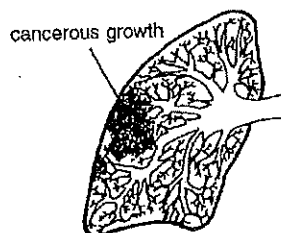
Worst of all, people who smoke are much more likely to get cancer, especially lung cancer. Cancer is an uncontrolled growth of the cells. The cells grow without dying naturally and form lumps. Nine out of every ten people with lung cancer are smokers. Not everyone who smokes will get lung cancer, but a smoker has a much higher chance of getting it. Smoking also causes cancer of the mouth and throat.



normal lining of the lung



lining of lung showing cancerous growth



Remember, there are other consequences of smoking too. It costs money to smoke. Money spent on cigarettes is money which is not spent on more useful things such as food and clothing for the family.

A person who is sick from an illness caused by smoking takes up the health resources of the country. The time and attention of health workers, doctors and nurses is taken by people who need not be ill at all!

ACTIVITY 14

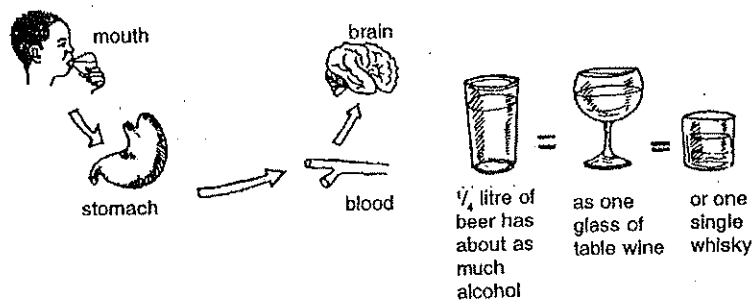
WHAT IS THE COST OF SMOKING?

1. Find the cost of one packet of cigarettes.
2. Ask an adult smoker how many cigarettes he or she smokes in one day.
3. Use this information to calculate how much they would spend in one week.
4. Make a list of several things that the family might use that cost the same amount.
5. Calculate how much the smoker spends in one year. Then work out the cost in one village which has 70 smokers.

2. Drinking alcohol

In many places in the world, drinking alcohol is a social custom. People drink alcohol when they are relaxing, at parties, and at other social occasions. Alcohol often plays an important part in the way that people enjoy themselves socially. However, when it is drunk to excess, it can cause misery, poverty and even death.

When a person drinks alcohol, it passes into the stomach. From here, it passes into the blood and then it is carried to the brain. This takes between 5-10 minutes. The brain controls the whole nervous system of the body. It controls the way in which we think and determines how we behave. Alcohol affects the brain temporarily. It affects the way we see and feel things.

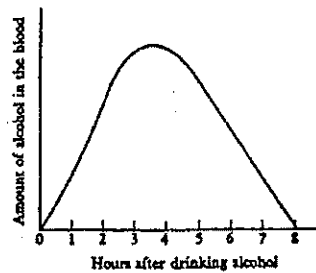


- The amount of alcohol in the blood depends on a number of things:
- a. the amount of alcohol drunk (different drinks contain different amounts of alcohol - beer about 5%-8%, wine about 10%, and spirits about 49%);
 - b. whether the person's stomach is full or not;
 - c. how much the person weighs.

The amount of alcohol in the blood rises for a while even after the person stops drinking. It then falls as the liver breaks it down into other substances. The graph below shows how the amount of alcohol varies in the blood of a man who drinks a litre of beer.

Effects of alcohol: Alcohol slows down the body's responses, so that a person cannot judge situations properly. A person who has been drinking and then drives is more likely to have a crash. Because of this, in many countries there are laws which forbid drinking and driving.

Since alcohol affects the brain it affects people's behaviour. Some people laugh more. Others become sleepy or aggressive. Young people, particularly, may lose self-control and do stupid or violent things.



Effects on blood alcohol levels after drinking one litre of beer.

In small quantities, alcohol does no harm to a person's health. If they drink a lot, however, health problems and other problems can become serious. Here are some of the things that can happen to a person who is a heavy drinker of alcohol.

He or she is more likely to suffer from liver and heart disease, pneumonia, ulcers, and cancer of the digestive system.

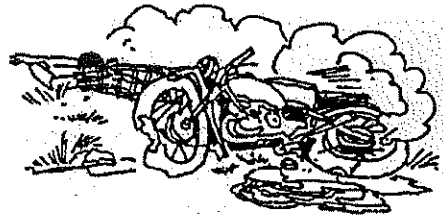


Mentally they become depressed when they are not drinking. They lose their self-respect.

At work, they have problems with their jobs, and getting along with other people.



At home, the problems may be worst of all. A drunken man may hit his wife and children. A drunken woman may abuse her husband and children. Families split up.



People who drink and drive may kill themselves or others.

And finally, alcohol costs money. People who drink heavily waste a lot of money which should be spent on healthy food for the family.



Smoking and drinking are both **addictive** habits. This means that people become so used to smoking or heavy drinking that they can not do without it. A person who drinks about 2 litres of beer a day may become an **alcoholic**. An alcoholic is a sick person who has to drink alcohol in order to feel normal.

3. Drinking kava

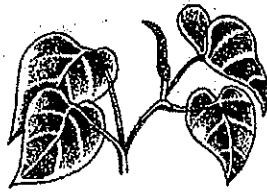
Kava is a drug that has traditionally been used in ceremonies and important events in the South Pacific. Today, many people have begun drinking kava regularly, sometimes every day. It has some benefits over alcohol because it generally makes the user quiet rather than aggressive. But, when some of its harmful effects are considered, it may be best to leave it for traditional ceremonial use only.

What is kava?

Kava is a drink made from the pepper plant *Piper methysticum*. The bush has long-stemmed heart shaped leaves and knotty branches. It is found throughout the South Pacific. There are chemicals in the plant that are responsible for its effects on the body. These chemicals can cross into the brain from the blood and affect the normal working of the nervous system.

What happens when you drink kava?

When you drink kava, the muscles relax and you get a feeling of



kava plant



root



drinking kava from a coconut shell

great happiness. There is a numbness of the linings of the mouth and throat. Large doses can cause a person to be clumsy and carelessness and drunkenness occurs. Sleepiness follows which can quickly progress to a deep sleep.

Long-term use of kava can have many serious side effects. There can be changes in the skin that look like the disease pellagra. The skin has scaled dark-coloured bands. The skin has yellow discoloration. Weight may decrease. The kava drinker may weigh up to 20% less than someone of the same age and sex who does not drink kava.

Kava interferes with Vitamin B being absorbed, can cause blood problems, lung problems, liver and kidney problems. There have even been deaths directly because of excessive kava drinking.

Questions:

Answer true or false to the following questions:

- ✓ Q1. It is estimated that every cigarette which you smoke shortens your life by one minute.
- ✓ Q2. The smoke which a smoker breathes out can harm other people.
- ✓ Q3. If a person smokes, he will definitely get lung cancer.
- ✓ Q4. Smoking when pregnant can damage the health of the unborn baby.
- ✓ Q5. Anyone who drinks alcohol will become an alcoholic.
- ✓ Q6. It is safe to drink kava every day.