

Excreta disposal options

Health aspects

Small amounts of excreta can carry enough germs to pass on a disease to someone else. So, even if water or food tastes and looks clean, it may have enough germs in it to pass on a disease to anyone who swallows it.

Not everyone who is infected becomes ill ; sometimes people can have a disease and show no

signs of illness. These people are known as asymptomatic carriers or healthy carriers. The germs grow in the gut of the carrier and pass out in their excreta ready to infect more people.

The excreta of all infected people are dangerous. It is impossible to know who is infected and so it is very important to dispose safely of all excreta. Figure 1 shows how disease is spread from excreta to infect new people.

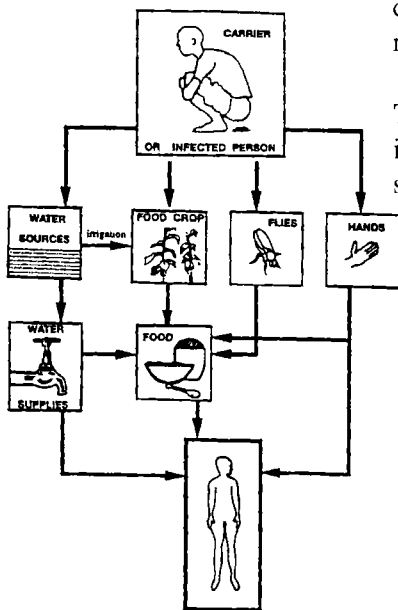


Figure 1. Spread of disease from excreta

One of the key ways to stop the spread of disease is to promote and practise good hygiene. Even where there is excellent sanitation, disease will spread rapidly if hygiene is poor. Three key hygiene behaviours can do the most to prevent the spread of disease :

Safer disposal of faeces : all faeces, but particularly those of young children and babies, and of ill people, should be carefully and quickly disposed of.

Handwashing : if people wash their hands regularly with soap and water, particularly after defecating, after handling babies' faeces, before feeding and eating, and before preparing food, the germs on their hands are removed or killed.

Maintaining drinking water free from faecal contamination : the source of water must be kept clean, and in the home water must be stored in a clean covered container to prevent faecal contamination.

Selection of sanitation alternatives

There are many different types of sanitation. The needs of the users and the resources available should be carefully considered to ensure that the most appropriate type of sanitation is selected.

To help select the most appropriate technology, the different types of sanitation technology are described briefly below. They are presented in more detail in the Fact Sheet referred to at the end of each section.

Simple pit latrine

This is the cheapest and most basic form of improved sanitation available, and is generally only supplied on a household basis. It consists of a square, rectangular or circular pit dug into the ground, which is covered by a hygienic cover, slab or floor. This slab has a hole through which excreta fall into the pit. Depending on user preference, a seat or squat hole with footrests can be installed, and a lid should be supplied to cover the hole. The latrine is covered with a shelter and should be situated well away from water sources and some distance from the home.

As well as isolating the excreta, the simple pit latrine has the advantage of being easy and cheap to construct. Depending on the material used for their construction, the slab and shelter can be re-used. Simple pit latrines can, however, produce unpleasant smells and allow flies to breed easily. For more information on simple pit latrines see Fact Sheet 3.4.

Ventilated improved pit (VIP) and Reed's odourless earth closet (ROEC) latrines

These are both improved types of pit latrine which aim to remove smells and flies from the latrine using a vent pipe. They use similar technology, the main difference being that the pit of the ROEC is wholly offset from the slab and connected to it by a chute, whereas the VIP pit is generally directly under the cover slab.

As with the simple pit latrine, a pit is dug into which the excreta fall. A cover slab with squat hole and a hole for a vent pipe is cast. A shelter is built, which must be kept semi-dark, and the vent pipe is raised to at least 0.5 metres above the top of the shelter. It is important that the latrine is well away from high buildings or trees.

These latrines share certain advantages : there are few problems with smell or flies ; the slab, vent pipe and shelter are re-usable ; and the excreta are isolated. Their disadvantages include the necessity of keeping the inside of the shelter semi-dark, which may discourage use of the latrine, and the maintenance required to ensure that the vent pipe remains in good working order. Another common problem with the VIP latrine is the difficulty of obtaining a durable fly screen for the vent pipe. In the case of ROEC latrines, the chute is easily fouled with excreta and so may allow

fly breeding. For more information on VIP and ROEC latrines see Fact Sheet 3.5.

Pour flush latrines

Pour flush latrines use a pit for excreta disposal, but have a special pan which is cast in a cover slab and provides a water seal. This ensures that all the odours are kept in the pit, although sometimes a vent pipe is also fitted. These latrines require only 1-3 litres for each flush and are most appropriate where water is used for anal cleansing and where there is a reasonably good level of water service, for instance a public standpost or, more likely, a yard connection.

There are several types of pour flush latrines : those with a pit directly below the slab ; those with a single offset pit ; and those with two offset pits. Each type has advantages and some pour flush latrines can be installed in the house with a pit outside. Generally, the advantages of a pour flush latrine are that there are no problems with flies or smell, they are easily cleaned and there is no fear of falling into the pit. The disadvantages are that pour flush latrines are generally more expensive than other pit latrines to build and require water to function. For further information on pour flush latrines see Fact Sheet 3.6.

Composting latrines

In the case of composting latrines, excreta and kitchen waste are disposed of and break down to produce compost which can be used as a fertilizer. There are two shallow pits or vaults, only one of which is used at a time. When one vault is full, it is covered with soil and closed for at least one year to allow the excreta to break down and become less harmful. While the first vault is closed, the second is used. When the second vault is nearly full, the first vault is opened and the dry, safe compost is dug out, leaving the first vault ready for use.

It is important that the vaults are kept dry to ensure that good compost is formed. Organic waste should be added daily to help the excreta break down and ash or powdered horse dung should be added after each use to absorb odours.

The advantages of composting latrines are that they do not need to be moved and new pits are not required once the latrine is full. The excreta can be used as a soil conditioner and the latrine also disposes of kitchen waste. Another important advantage is that a composting latrine can be built entirely above ground. The disadvantages are that they can be more expensive and difficult to build than other pit latrines and need a relatively high level of training to ensure their proper use. These latrines are most appropriate in rural areas where human excreta are used as fertilizer. For further information on composting latrines see Fact Sheet 3.7.

Aquaprivies

The aquaprivy is a tank filled with water into which excreta fall. It uses a simple water seal to prevent odours getting out of the tank, and a soakaway to dispose of sullage and effluent. The drop pipe has to reach below the surface of the water in the tank to prevent the escape of odours. The tank must be watertight to prevent pollution of groundwater and should be emptied about every three years.

The advantages of the aquaprivy are that there are no problems with flies or smell, it cannot be blocked with bulky anal cleansing material, and it can be connected to a sewerage system at a later date. The disadvantages of the aquaprivies are that it is expensive to build, it needs water to work, the water seal can be hard to maintain where water cannot be added daily and in cold areas where it may freeze, and the tank must be emptied about every 3 years. For further information on aquaprivies see Fact Sheet 3.8.

Septic tanks

Septic tanks are watertight chambers sited below ground level that receive both excreta and flush water from flush toilets and other

household sullage. The solids settle out and break down in the tank, whilst the effluent stays in the tank for a short while before overflowing into a sealed soakpit. Septic tanks must be emptied, usually mechanically, at regular intervals. Septic tanks allow safe disposal of wastewater, particularly in rural areas where wastewater is often discharged direct into rivers. Septic tanks can also be used in urban areas.

Septic tanks have the advantages of little maintenance, isolation of excreta, few problems with odour or flies and possible later connection to a sewerage system. Their disadvantages are the high cost of construction, recurrent mechanical emptying, the need for permeable soils so that soakpits can function properly, and the need for a piped water supply to the latrine. For further information on septic tanks see Fact Sheet 3.9.

Sewerage and sewage treatment

Sewerage is the removal of excreta, flushing water from toilets and household sullage through a pipe network to a treatment works or disposal point. When this is operated correctly and the waste properly treated, sewerage can be an effective method of excreta removal. In many areas of the world, sewage is allowed to flow directly into rivers untreated ; this represents a major public health risk.

Sewerage is generally the most costly solution of the various excreta disposal options and alternatives mentioned in this Fact Sheet, although certain modified sewerage systems do offer substantial savings in capital expenditure. It is generally best employed in urban situations and where sufficient funds are available for its proper construction, operation and maintenance. In low-income areas, modified sewerage may be employed, which will allow a greater level of community management and maintenance.

The advantages of sewerage are that it can treat large amounts of water and provides great user convenience when connected. The main disadvantages are the generally high capital and operating costs, the large amount of flushing water required and the fact that the effluent still contains large numbers of germs. For more information on sewerage and sewage treatment, see Fact Sheet 3.11.