

Disclaimer: While I have made considerable effort to ensure the accuracy of this information, I make no promises.

Let's just say, you gotta do something about sewage. Not only does it smell bad, but it also attracts insects and spreads diseases.

In most third-world countries, dehydration caused by diarrhea is the number one cause of infant death, and it's the second leading cause in most of the rest.

Now, we can fight all day about whether diarrhea cases should be medicated. Some people say yes, on the basis that diarrhea can interfere if one has to travel. On the other hand, diarrhea is the body's method of clearing out a gastrointestinal infection or illness, and interference with this process can prolong the overall illness. In my opinion, medication should not be used unless the patient absolutely must march or work while afflicted.

Diarrhea can be treated with a number of commercial medications, such as lomotil and kaopectate, or by diet, with foods high in insoluble fiber, such as rice or bananas. In all cases, it's of critical importance to replace all water lost-that means drinking constantly even if the patient isn't necessarily thirsty (When I was working in Ecuador, I had a partner come down with "turista" and she drank almsot four gallons a day). Just as important, the water needs to be CLEAN-no live pathogens as these will merely prolong the condition. The water can be treated by a number of methods, such as filtering, boiling, or iodine (an FAQ regarding water treatment is available elsewhere on this site).

Some of the more common diseases with this symptom such as cholera or giardia, don't necessarily require medication-given time and plenty of clean food and water, the body will completely clean itself out. However, this can take several weeks.

These diseases can be prevented by a number of common-sense measures.

Food should be cooked. Fruits and vegetables can carry the disease if they are unwashed, or washed in water that cannot be trusted. Fruits that have peels that are not eaten, such as citrus or bananas, can be eaten raw provided they are carefully peeled. Fruits or vegetables with peels that are eaten, such as tomatoes or peaches, or that do not have peels, such as all berries, should be washed thoroughly in clean water before eating.

Meat should be cooked at least medium-no red-before consumption. Pork, fish, and fowl should probably be cooked even more, as these harbor a number of diseases.

Diary products should be stored in closed containers and in general should also be refrigerated (heavily cured cheeses, such as Parmesan, being an exception). Also, pasturized dairy products from livestock in clean conditions is strongly preferred-unpasturized milk can be dangerous.

All food should be kept covered, so that flies cannot reach them-flies are the main agent for transmitting the more common gastrointestinal diseases.

At all times, after using the washroom (or field equivalent) and before eating or handling food, one should wash one's hands with soap and water-a good antibacterial soap is recommended where available. In addition, one should wash their hands after handling animals or coming into contact with any bodily

fluids-when slaughtering or butchering animals or providing first aid, gloves are **HIGHLY** recommended.

Human waste should be buried, both to allow decomposition and to prevent flies from coming into contact with it. Waste carries a number of microorganisms which, while playing a valuable role in the lower intestine, cause severe illness anywhere else in the gastrointestinal tract.

For temporary sites, such as on a camping trip, a slit trench, or "cat hole" can be dug. This hole is deep enough that all waste is completely covered, should also have organic soil on the bottom-this comes to about six inches deep on average. The hole is completely covered after use.

For more permanent sites, such as a homestead, a full outhouse is necessary. This will consist of a pit, a platform, and an outhouse at the bare minimum-a stool and seat tend to be welcome additions.

The pit is where the waste actually goes, and where it is decomposed. This pit should be **DEEP**- six feet is a good minimum. In Honduras, where we worked on a community sanitation project dealing with this information, the pits we dug averaged about eight or nine feet deep and three feet on a side. With the pit, it is less important to have organic soil at the bottom than it is with the cathole-as a matter of fact, none of the pits we did had organic soil at the bottom. However, it helps to save some of the organic soil from the digging and dump it into the bottom of the pit to aid decomposition. A few inches depth at the bottom is plenty.

The platform is generally made of reinforced concrete-the ones we made used a standard mixture of one part cement to several parts each of gravel and sand (but the sand should be completely free of organic matter to be considered strong). The reinforcing bars used were quarter-inch steel dowel rod, spaced four to six inches apart and tied together with baling wire. The reinforcing bar should be cut to such a length that each rod terminates about two inches from the edge of the platform-above all the rods must **NOT** be allowed to come into contact with the air once the concrete is poured. Finally, the rod intersections should be elevated above the ground by small rocks. A typical platform ends up being four or five inches thick, and four feet on a side.

For obvious reasons, a hole should be left in the middle of the platform-a ring of PVC pipe or the like about ten inches to a foot in diameter works quite well. In addition, a pipe for ventilation should also be included. This pipe need not be too large-a few inches diameter is just fine, and should extend slightly below the underside of the platform, and above the roof of the outhouse.

The average platform was about a foot larger on each side than the pit diameter, so that for a 3'x3' pit, the platform was about 4'x4'. In areas with weaker soils, the platform may be made wider, or the pit may have bricks or timbers placed inside to provide internal support.

The outhouse is a necessity, both for privacy and protection from the elements, and to keep the flies out. These are fairly simple affairs, and just require scrap lumber and nails to build. It should enclose the platform, be reasonably windproof, and have a door capable of closing.

Toilet paper is nice to have, but not strictly necessary. Foliage or whatever can be substituted. Whatever is used, though, should be burned or buried after use. Throwing it into the pit will cause the pit to fill prematurely.

Over time, the pit will gradually fill. When it fills to about two or three feet below grade, a new pit

should be dug elsewhere and the original pit filled in and allowed to decompose.

Pits and catholes need to be carefully sited to protect your water supply. They should always be a considerable distance from dwellings, food storage areas, wells, rivers, ponds, and the like. In general, 100 to 200 feet is advised, and downwind of the campsite/house.

By properly containing waste, you've cut off most of the infection risk at the source. By cooking and covering food properly, you've made a major dent in the disease cycle. By proper storage (see Alan Hagan's [Food Storage FAQ](#)) you make yet another dent in the disease cycle. Where that leaves you is with the need for a clean source of water. See Patton Turner's Water Treatment FAQ elsewhere on this site for details.