

Cholera in Peru

Fred M. Reiff

Peru is making determined efforts to disinfect community water systems and thus control this ancient pestilence.

Since 7 March 1992 Peru has suffered more than 400 000 cases of cholera and over 3100 deaths in the epidemic which broke out in this country in late January 1991. Cholera is usually spread from one location to another by people, and can also be propagated by contaminated water. Travel is relatively inexpensive in Peru and the people use the well-developed national transport system extensively. This mobility to a large extent helped to ensure cholera's rapid introduction into all parts of the country, and as long as there is even one focus of infection it can spread in this way.

The appearance of cholera, however, does not necessarily result in epidemic propagation, which occurs only where environmental health conditions and hygienic practices are deficient. This was confirmed in Latin America, where the overwhelming majority of cholera cases have been in economically disadvantaged areas with no basic infrastructure of public services (water supply, sanitation and solid waste disposal).

Prompt treatment with rehydration therapy and antibiotics can reduce the severity of the disease and save lives, but this has a limited effect on the spread of cholera. Mass immunization is generally not prescribed as a public health measure because of the short-lived and uncertain immunity it provides. Environmental health measures to protect water and food from contamination (or to decontaminate them) and to promote good

personal hygiene practices remain the most effective barriers to the spread of cholera.

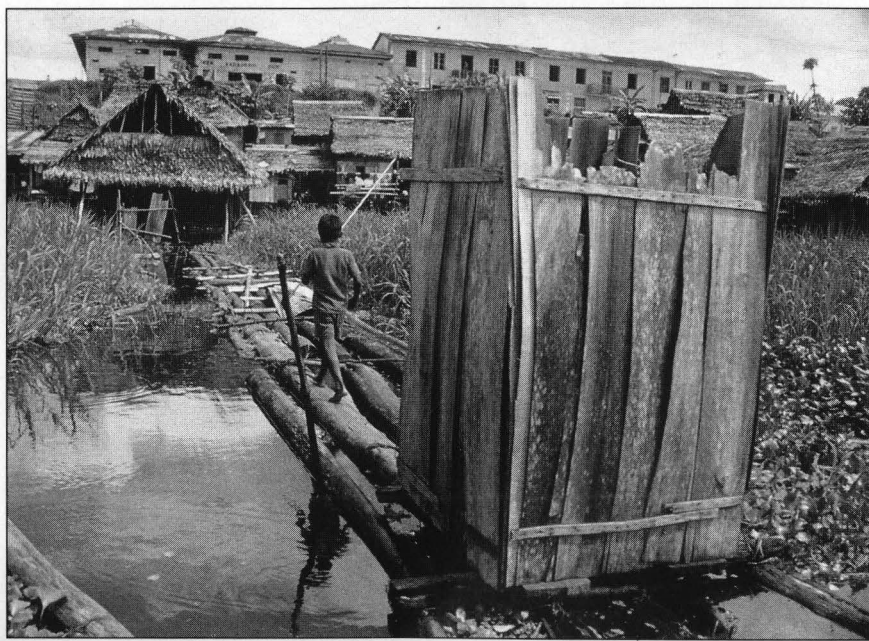
Water and food contamination

In the absence of safe water, adequate sanitation and food safety, water and food can be vehicles for the spread of cholera. Indeed, contaminated water is frequently the cause of contaminated food, and it follows that the sanitary disposal of excreta should play a key role in the prevention of this disease. Direct contamination of food with a cholera victim's excreta is a rarity but indirect contamination with polluted water during handling and processing is commonplace. Even when the level of contamination of water is below the infective dose, once it comes in contact with foods which support the growth of *Vibrio cholerae* such as rice, fish, crab, shrimp and so forth, the subsequent proliferation of this organism on the food can result in an

infective dose in a matter of hours or even minutes.

Various studies in Peru have demonstrated the poor water quality in many of the areas now affected with cholera. Between 1984 and 1985, 100 water supply systems were examined, including wells, springs and surface water supplies both with and without filtration. Most of them produced contaminated water. Only two of the 40 systems claiming to practise chlorination were satisfactory (with adequate chlorine residuals) and, among the simple gravity systems, none of the 20 claiming to practise disinfection showed chlorine residuals.

In many localities, ice is prepared from water which receives little or no treatment, a situation perpetuated by the myth that freezing destroys the pathogen. This simply is not true. Ice proved to be a common source of food and beverage contamination. Washing-up water used many times by street vendors for glasses, plates



When latrines contaminate drinking-water, cholera danger lurks.

and utensils has also been implicated. Other sources of contamination of food included the use of sewage-polluted water for irrigating food crops, and the eating of raw shellfish such as oysters, mussels and clams, which are filter-feeders and therefore tend to concentrate microorganisms.

Chlorine as disinfectant

Adequate treatment of water used for drinking, for preparing and processing food, for washing dishes and utensils, and for personal hygiene is thus a cornerstone of cholera prevention. Fortunately the most common water disinfectant, chlorine (as hypochlorite) is very effective against *V. cholerae*; it is also extremely cheap, costing an average family between US\$ 0.25 and \$2.00 each year, depending upon the type of water supply, the local cost of chlorine, the water consumption rate and the method of disinfection. Disinfection by boiling also effectively kills this pathogen but has two disadvantages: it provides no residual protection against recontamination, and it is relatively expensive with an annual cost per family of more than \$20.

In order to contend with the epidemic, Peru has increased its



Intravenous and oral rehydration.

efforts to restore, upgrade and expand existing water systems to meet the need of the unserved population. The Ministry of Health and the Ministry of Housing have both started special programmes to disinfect community water systems and there is special emphasis on appropriate technology at the household level. However, the magnitude of the environmental health

needs surpasses the capacity of the country to meet them.

The Pan American Health Organization (PAHO/WHO) has supplemented national efforts with many forms of assistance and collaboration in the public health sector, an important component of this being related to disinfection and control of water quality. With emergency funds provided by the Interamerican Development Bank, PAHO purchased a total of 100 gas chlorinators and 50 hypochlorinators for installation in community water systems and 10 iodinated resin treatment systems for hospitals, clinics and schools. PAHO and the Pan American Development Foundation also shipped a total of 80 tons of calcium hypochlorite, donated by the private sector, for disinfecting small community water systems in Peru.

Since it is the deterioration in the water, sanitation and health infrastructure that has permitted the introduction and spread of cholera, only the correction of existing deficiencies will eliminate the disease and prevent its reintroduction. The backlog of work to be done is considerable, but there is little question of its necessity. Improvements in basic environmental health conditions will be required if cholera is to be eradicated from Latin America and the Caribbean, or even if there is to be sustained control and prevention of this ancient pestilence. ■



Dirty containers can contaminate safe water.

Mr Fred M. Reiff is a Sanitary Engineer with the Environmental Health Programme in WHO's Region of the Americas, 525 Twenty-third Street, N.W., Washington, DC 20037-9897, USA.