



Health update March–May 1993

CONTROLLING CHOLERA

The current cholera pandemic started in 1961 and shows no sign of ending. Although much is being done to ensure that communities respond quickly and effectively to the threat, longer term measures are needed to prevent its continued spread. This *DD* insert looks at the latest trends, and provides guidelines on treatment and prevention.

Cholera continues to spread throughout the world. It is gaining a stronger foothold in places where it has been present for years, as well as appearing in new areas.

In Latin America, cholera appeared for the first time this century, in Peru in 1991. It then spread rapidly throughout the continent. By the end of 1991 nearly 400,000 cases had been reported¹. New outbreaks have recently occurred in Argentina and Paraguay. The encouraging news, though, is that the mortality rate has been very low – around 1 per cent².

Recently cholera has taken its greatest toll in Africa. The disease swept across southern Africa in the second half of last year. Large numbers of cases were reported in Angola, Swaziland, Zambia, Malawi, Tanzania and Mozambique. In Zimbabwe, which had not been affected by cholera since 1985, more than 4,000 cases were reported in the space of three months.

Although the total number of cases reported in Africa is much less than in the Americas³, the death rate is a lot higher – averaging 9 per cent in 1991. The reasons for this have not been proven, but three possible causes are being investigated:

- less access to effective health care in Africa compared with Latin America
- not enough trained health personnel
- the fatality rate may be exaggerated because only the most severe cases are coming to health centres.

Health planners believe that unlike other cholera outbreaks, this latest pandemic will not go away. Instead, cholera is expected to become endemic in the Americas, as it has in Africa.

It is difficult to say where cholera will strike next, or how long it will remain a



Mark Edwards/Still Pictures

The horror of cholera in Bangladesh in the 1970s. However, the disease need not be a killer if simple prevention and treatment measures are taken.

problem. But despite these unanswered questions, much is known about how to prevent and treat it.

Prevention and treatment

Cholera treatment is not very different from treatment of 'ordinary' diarrhoea. The key is oral rehydration therapy. However, because dehydration can happen rapidly, it is sometimes necessary to begin rehydration intravenously. For severe cases, antibiotics have been shown to reduce the duration of diarrhoea. (See over for more detailed guidelines.)

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DEFINITIONS

- **Endemic:** a disease continually present in a region
- **Epidemic:** an outbreak of a disease, introduced from outside a community, which attacks many people over a short period of time
- **Pandemic:** an extensive epidemic which affects the populations of several countries or regions

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Effective prevention methods are also the same as for other forms of diarrhoea:

- provision and use of clean drinking water
- handwashing
- good home and environmental hygiene and sanitation
- avoidance of potentially contaminated foods.

Common, but **ineffective**, prevention measures include:

- vaccination
- giving antibiotics to large numbers of people who are not sick
- restricting the movement of people (e.g. quarantine or 'cordon sanitaire')
- restricting food imports from affected areas.

Trying to enforce these measures takes attention away from the simple and effective methods mentioned earlier.

Cholera's reputation as a killer has been earned over the centuries, but modern advances mean we now have the scientific and public health solutions. However, the conditions which enable cholera to be spread – lack of knowledge, poverty and social inequity – also need to be challenged.

FACT FILE

- 90 per cent of cholera cases are mild. Many infected people have no symptoms, but can be carriers and infect others.
- Even in a cholera outbreak, more children die from other types of diarrhoea.
- The main danger from cholera is rapid dehydration. It must be treated quickly. Unless patients receive rehydration they can die, sometimes in a few hours.
- Most cholera cases can be treated successfully with oral rehydration therapy. However, the few that become **severely** dehydrated need intravenous fluid initially and antibiotic treatment.
- Neither vaccination, quarantine, nor travel restrictions prevent cholera from spreading.
- In the long term, improved water supply, sanitation and hygiene, and better living conditions are crucial to preventing cholera.

The key to eliminating cholera, as for other diseases linked to underdevelopment, lies in improved education and communication systems, adequate and safe water supplies, provision of sanitation systems, effective public health programmes and availability of treatment.

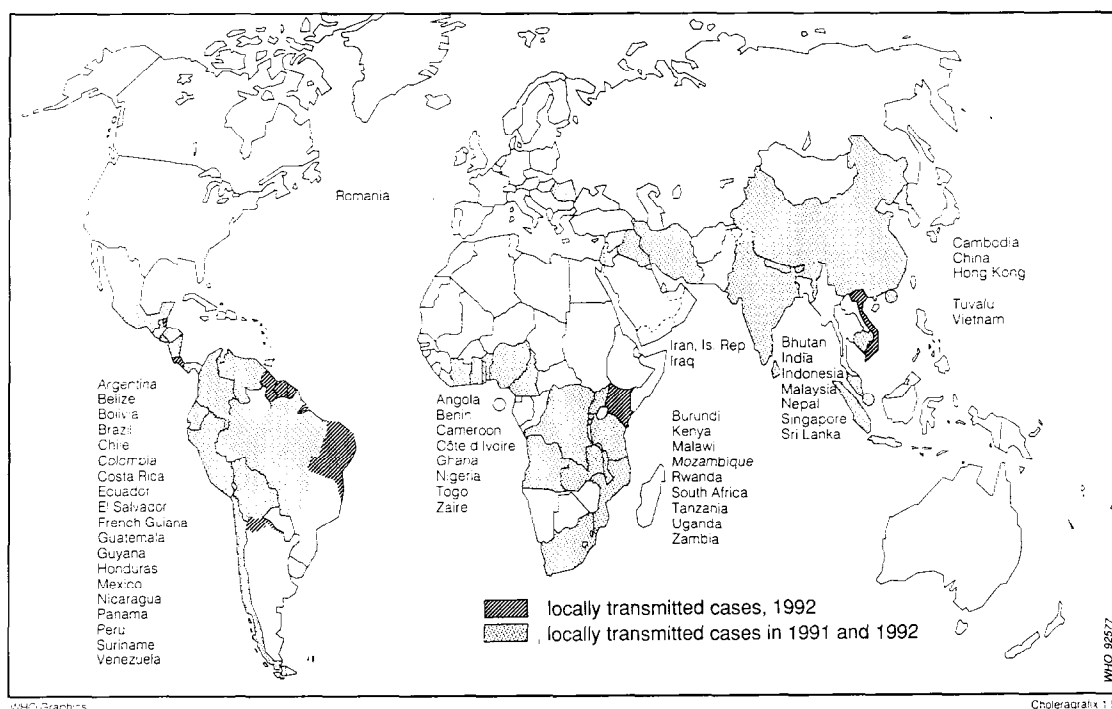
**Dr Ronald Waldman, CDD, WHO,
CH-1211 Geneva 27, Switzerland.**

1. 391,220 cases. WHO figures. The figures for 1992 were not compiled at the time of publication.

2. 4,002 deaths

3. 153,367 cases in 1991

Countries reporting cholera in 1992 (as at November 1992)



How to assess and treat cholera patients

A step-by-step guide to diagnosis and management

Cholera should be suspected when:
a child over five or an adult develops severe dehydration from acute watery diarrhoea

or

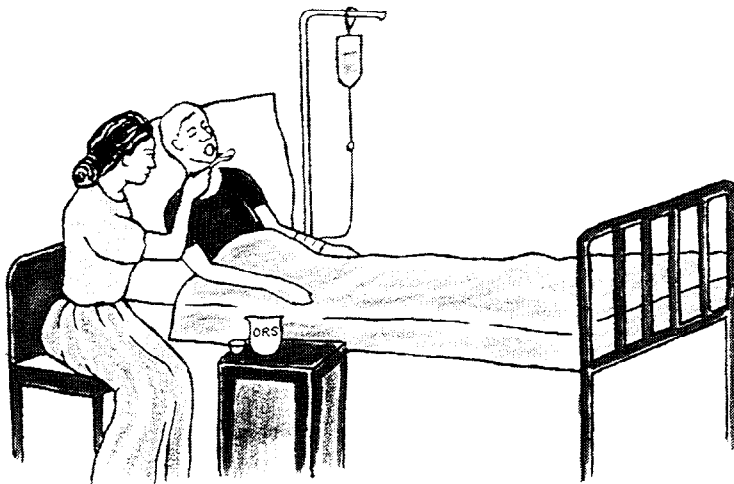
anyone over two years old has acute watery diarrhoea in an area where there is an outbreak of cholera. (Cholera may attack children under two, but this is unusual.)

STEP 1 Assess for dehydration

The table below can be used to assess whether a patient is dehydrated. 'Some dehydration' or 'severe dehydration' can be diagnosed if the patient has two or more signs in the appropriate column. In the case of 'some dehydration' or 'severe dehydration', this should include at least one of the signs in the coloured box.

Assessment of the diarrhoea patient for dehydration

	NO DEHYDRATION	SOME DEHYDRATION	SEVERE DEHYDRATION
CONDITION	Well, alert	Restless, irritable	Lethargic or unconscious, floppy
EYES	Normal	Sunken	Very sunken and dry
TEARS	Present	Absent	Absent
MOUTH & TONGUE	Moist	Dry	Very dry
THIRST	Drinks normally, not thirsty	Thirsty, drinks eagerly	Drinks poorly or not able to drink
SKIN PINCH	Goes back quickly	Goes back slowly	Goes back very slowly



STEP 2 Rehydration

FOR SEVERE DEHYDRATION

- **Give IV fluid immediately.** Use Ringer's lactate solution or, if not available, normal saline.
For patients older than one year, give 100ml/kg over three hours (30ml/kg within the first half hour, then 70ml/kg in the next two-and-a-half hours).
For infants under one year old, give 100ml/kg over six hours (30ml/kg in the first hour, then 70ml/kg over the next five hours).
- **Monitor the patient frequently.** After the initial 30ml/kg has been given, the pulse (taken at the wrist) should be strong. If the pulse is not yet strong, continue to give IV fluid rapidly.
- **Give ORS solution** (about 5ml/kg/hour) in addition to IV fluid as soon as the patient can drink.
- **Reassess the patient** after three hours (or six hours in the case of infants). If there are still signs of 'severe dehydration' (this is rare) repeat the IV therapy. For signs of 'some dehydration', continue as indicated below. If there are 'no signs of dehydration', go on to **STEP 3**.

FOR SOME DEHYDRATION

- **Give ORS solution** according to the amount recommended in the table below. If the patient passes many watery stools or wants more ORS solution, then give more.

Approximate amount of ORS solution to give in the first 4 hours

AGE ¹	WEIGHT	ORS SOLUTION
Less than 4 months	Less than 5kg	200-400ml
4-11 months	5-7.9kg	400-600ml
12-23 months	8-10.9kg	600-800ml
2-4 years	11-15.9kg	800-1200ml
5-14 years	16-29.9kg	1200-2200ml
15 years or more	30kg or more	2200-4000ml

¹ Only use a patient's age if you do not know their weight.

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- Monitor the patient frequently to ensure that ORS solution is being taken and to identify those passing frequent watery stools, who will require closer monitoring.
- Reassess the patient after four hours. If the patient has developed 'severe dehydration' (this is rare), rehydrate with IV fluid as described earlier. If there is still 'some dehydration',

continue to give ORS solution at the same rate and start to offer food and other fluids. If there are 'no signs of dehydration', go on to **STEP 3**.

NO SIGNS OF DEHYDRATION

Patients first seen with 'no signs of dehydration' can be treated at home.

- Give ORS packets to take home. Give enough for two days. See *DD* page 7

for guidelines on how much ORS solution to administer.

- Instruct the patient or caregiver to return if any of the following signs develop:
 - Passing many watery stools
 - Eating or drinking poorly
 - Marked thirst
 - Repeated vomiting
 - Fever
 - Blood in stool

STEP 3 Maintain hydration

When a patient who has been rehydrated using IV fluid or ORS solution no longer shows signs of dehydration, continue to give ORS solution to maintain normal hydration.

As a guide, give the patient:

Approximate amount of ORS solution to give to maintain hydration

AGE	AMOUNT OF ORS SOLUTION AFTER EACH LOOSE STOOL
less than 24 months	100ml
2-9 years	200ml
10 years or more	As much as wanted

- Continue to reassess the patient for signs of dehydration at least every four hours to ensure enough ORS solution is being taken.

A few patients whose stool output is very large may have difficulty in drinking enough ORS solution. If such patients become tired, vomit frequently or develop abdominal distension, ORS solution should be stopped and hydration maintained intravenously until the rate of stool output slows.

Source: WHO, 1992. *Management of the patient with cholera*.

STEP 4 Antibiotic treatment

An effective antibiotic can reduce the volume and duration of diarrhoea in patients with severe cholera. It will usually stop the diarrhoea within 48 hours. Antibiotics should only be used for patients who develop severe dehydration. Over-use of antibiotics can lead to the development of resistant strains of bacteria.

If the patient is severely dehydrated, over two years old and cholera is suspected, give an antibiotic.

Start the antibiotic after the patient has been rehydrated (usually in 4-6 hours) and vomiting has stopped.

There is no advantage in using injectable antibiotics, which are expensive. No drugs other than those described in the next column should be used to treat cholera.

Doxycycline is the antibiotic of choice for adults (except pregnant women) because only one dose is required. **Tetracycline** is just as effective, but must be given for three days.

Trimethoprim-Sulfamethoxazole (cotrimoxazole) is the antibiotic of choice for children below 12 years. **Tetracycline** is equally effective; however in some countries it is not available for paediatric use because in large doses it can cause staining of children's teeth.

Furazolidone is the antibiotic of choice for pregnant women.

Erythromycin or chloramphenicol may be used when the antibiotics listed above are not available, or where *Vibrio cholerae* 01 is resistant to them.

Antibiotics used to treat cholera

ANTIBIOTIC	CHILDREN	ADULTS
Doxycycline a single dose	_____	300mg
Tetracycline 4 times a day for 3 days	12.5mg/kg	500mg
Cotrimoxazole (Trimethoprim - TMP; Sulfamethoxazole - SMX) twice a day for 3 days	TMP 5mg/kg and SMX 25mg/kg	TMP 160mg and SMX 800mg
Furazolidone 4 times a day for 3 days	1.25mg/kg	100mg

STEP 5 Feed the patient

- Resume feeding with a normal diet after the patient is fully hydrated and vomiting has stopped.
- Continue breastfeeding infants and young children.

The low fatality rate in Peru

The appearance of cholera in Latin America two years ago caused alarm among health workers. However, the good news is that fatality rates have been low. **Enrique Jacoby** and **Bruno Benavides** review possible reasons for the low death rate in Peru.



WHO/PAHO/J. Vizcarra

Unhygienic storage of water in poor settlements can cause cholera outbreaks.

A hot summer and a water shortage along Peru's coastal strip proved to be a fatal combination in early 1991, providing the setting for Latin America's first cholera outbreak this century.

The cholera-causing organism, *Vibrio cholerae* 01, appeared simultaneously in three coastal cities. An explosive epidemic followed, affecting all the major cities and later spreading to rural areas.

Five months later 200,000 cases had been reported. But, despite the fact that Peru had no recent experience of treating cholera, the death toll was surprisingly low – on average 1 per cent of reported cases.

The information available showed high attack rates and low fatalities in the cities,

and the opposite in rural areas – lower rates of illness, but higher mortality. We tried to learn what caused these differences.

First, we looked at access to health facilities to see whether that affected the fatality rate. Surveys of two urban areas with low death rates, the northern city of Piura and the capital, Lima, showed that about 90 per cent of people with cholera went to a health facility. A study in the Amazon region showed that villages with poor access to health services had the highest death rates.

A second possible explanation was tested. Some health planners believed that home use of oral rehydration salts (ORS) solution helped to reduce the death toll. We

conducted a case-control study among patients registered in the main hospitals in two cities, Piura and Sullana, comparing the home use of ORS solution among cholera survivors and those who died.

We found no significant differences in the rate of use of ORS solution before reaching hospital by survivors and those who died. This was probably because those who had used ORS solution had only consumed, on average, less than one litre, a completely inadequate amount for patients with cholera.

Seeking medical help

A third possible explanation was posed: Did people's action in seeking medical help contribute to low mortality? Surveys in Lima and Piura carried out in September 1991 asked what people would do if they or a member of their family had cholera. In both places over 80 per cent said they would go straight to a health facility, while less than 1 per cent would take ORS solution exclusively. Few (1.2 per cent) said they would go to a community oral rehydration unit, probably because it is easy for most people in cities to reach a hospital – 96 per cent of urban dwellers in Peru are within an hour's travel of a hospital.

So, what have we learnt from the experience of Peru? We believe that in cities and towns, people should be encouraged to go quickly to hospitals, since immediate seeking of appropriate treatment seems to have saved many lives in Peru. Case management at hospitals should be improved and standardised, through better training.

In rural areas, however, a strategy based on treatment with ORS solution by a trained health worker in a community oral rehydration unit is likely to be most effective, especially in those regions where a hospital is not within reach.

Enrique Jacoby and Bruno Benavides, Instituto de Investigación Nutricional, Apartado Postal 18-0191, Lima, Peru. Study supported by UNICEF.

How to prevent the spread of disease

Communities can take the following steps to reduce the transmission of cholera

The stools of people infected with *Vibrio cholerae* 01 contain the cholera organism even if they themselves are not sick. If cholera germs from these stools contaminate food or water, they can be swallowed by other people, which spreads the disease. This process is called faecal-oral transmission.

Health workers and families can do much to reduce the spread of infection. The most important actions are:

- ensure an adequate supply of safe drinking water
 - prevent the use of contaminated drinking sources
 - provide information about how people can purify water at home
 - ensure immediate and hygienic disposal of dead bodies
 - discourage large gatherings such as feasts or funerals
 - establish emergency treatment centres with sufficient amounts of essential supplies, such as oral rehydration salts and intravenous rehydration solution
 - train medical personnel, if necessary, so they can identify patients early and treat them correctly
 - treat cholera patients in a separate area and disinfect contaminated materials (e.g. bedding, drinking vessels).
- Wash your hands before preparing food and especially after using the toilet.
 - Cook food thoroughly.
 - Eat cooked food immediately. However, if cooked food is stored, boil or heat it thoroughly before eating it.
 - Fruits and vegetables should be cooked and peeled. Raw, unpeeled fruit should not be eaten.

Safe drinking water

Wherever possible obtain drinking water from a safe, uncontaminated source (e.g. a sealed well, a borehole, rainwater, a well maintained piped water supply). If you are not sure that the water is safe:

- disinfect it with alum potash or chlorine (see DD45, page 2 of supplement for instructions)
- bring water to the boil, then boil it vigorously for one minute.

Store water in a clean, covered container. Use a ladle with a long handle for taking it out, so that hands do not come into contact with the water.

Hygiene and waste disposal

- If possible, wash kitchen dishes with soap, rinse with clean water and use a clean cloth to wipe dishes dry (or leave dishes to dry in sunlight in a clean place).
- Dispose of all stools and faecally-contaminated materials in a latrine or bury them if latrines are not available.

Public health measures

If an epidemic occurs, local authorities should take the following actions:

- provide/maintain safe and adequate community facilities for excreta disposal

COMMON SOURCES OF INFECTION

- * water contaminated at its source (e.g. by faeces leaking into an incompletely sealed well) or during storage (e.g. by contact with faecally-contaminated hands)
- * contaminated foods that are eaten raw or undercooked, or stored at a temperature at which bacteria can rapidly multiply
- * raw vegetables that have been washed with contaminated water

RESOURCES

World Health Organization

WHO has recently revised its cholera information pack which contains the following documents, available free:

Management of the patient with cholera – treatment guidelines.

Guidelines for cholera control – for managers of national programmes and others responsible for cholera control.

WHO guidance on formulation of national policy on the control of cholera – for senior health officials and development agencies.

Requests to CDD, WHO, CH-1211 Geneva 27, Switzerland.

The Child-to-Child Trust

Child-to-Child produces resources for teachers and health and community workers, for use in teaching children how to improve the health of other children.

Activity sheets are available on prevention and treatment of disease, personal and community hygiene, child development, nutrition, safety, disability and helping children in difficulty. The sheet on cholera is available free to people in developing countries. The full set of activity sheets is £2.

Children's readers Attractive storybooks are available on ORT – **A Simple Cure** (£1.20) . and the need for clean water – **Dirty Water** (£1.05).

Requests to Child-to-Child, Institute of Education, 20 Bedford Way, London WC1H 0AL, UK.

PRITECH

Technical Literature Update, special cholera issue – A summary of the latest information on cholera, including control, treatment, news on the epidemic and prevention. Available free.

Development of a cholera checklist for cholera control – Aimed at ministries of health, cholera committees and international consultants to assess national preparedness for preventing and controlling cholera outbreaks.

Requests to PRITECH Information Centre, 1925 North Lynn Street, Suite 400, Arlington, VA 22209-1707, USA.