Preparedness for epidemic cholera during the 1995 floods in Bangladesh

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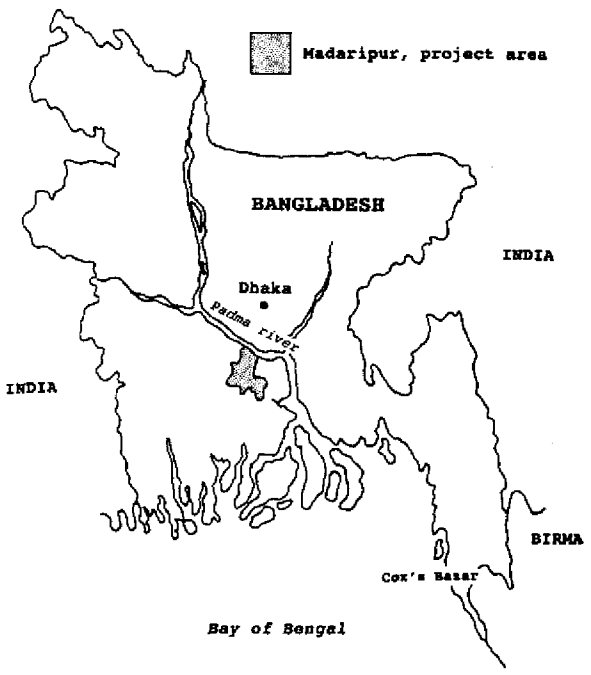
Introduction

In July 1995, excessive monsoon rains in Bangladesh resulted in the flooding of approximately one quarter of the country. Shib Char Tana in Madaripur district was one of the affected areas (cf. Figure 1). Approximately 10,000 people were forced to flee their homes and set up temporary shelters on the embankment of the Padma river. These displaced populations had no access to safe water and were deprived of any sanitary facilities. Another population of 10,000 people on the isolated island of Char Janajat, also severely affected by the floods, faced similar conditions and were difficult to reach because of the strong current in the Padma river.

After an exploratory mission in July 1995, MSF-Holland agreed to assist the flood relief operations in Shib Char and Char Janajat. The overall objective of the mission was to reduce mortality and morbidity among the flood affected population, and specifically to prevent diarrhoeal diseases, provide cholera epidemic surveillance, and ensure medical preparedness for any outbreak.

Figure 1. Bangladesh, 1995. MSF's logistical centres at Dhaka and Cox's Bazar.



Staff, management, logistics and materials

Using the MSF database, staff with previous experience in similar conditions were identified and selected. Some staff members were temporarily assigned to the project from another MSF-Holland programme in Bangladesh, which provides medical and nutrition assistance to Burmese refugees. The overall programme was supervised by an expatriate logistician/nurse, assisted by a national project coordinator, a national water and sanitation supervisor and a national doctor.

Through collaboration with a local NGO, Peoples Development Efforts (GUP), local expertise and staff were added to the programme. MSF's liaison office in Dhaka was used as the logistics base, and two logistics officers (one national and one expatriate) in Cox's Bazaar were responsible for supply lines and data analysis.

For the transport of staff and patients in the field there were two local diesel boats, one four wheel drive pick-up with radio communication and a local taxi. A Zodiac (rubber speed boat) borrowed from MSF-France saved much time, and proved very effective in crossing the strong Padma river to reach the island of Char Janajat.

The ICDDR, B hospital in Dhaka provided the back-up for the cholera diagnosis. Samples of suspected case stools were sent to the hospital for culture. Sensitivity testing was also carried out where necessary, to amend the standard Bangladeshi treatment policies of Bangladesh adopted during the mission.

MSF's cholera preparedness plan (Cholera Guidelines) and cholera kits were used.

Specific objectives and operational plans

1. Prevention of diarrhoeal diseases

- To provide safe drinking water by installing new tube-wells and chlorination of existing wells;
- Building of latrines;
- Spraying (disinfecting) of contaminated areas;
- Health education.

2. Monitoring diarrhoeal diseases, particularly cholera

Close surveillance of morbidity and mortality, and effective case detection for an early warning system, through:

- out-patient department as a static component,
- outreach workers actively involved in case finding and referral,
- setting up a data information system to analyze the information and respond accordingly.

3. Adequate medical preparation in case of a cholera epidemic

Preparations to enable the establishment of a functioning treatment centre for cholera within one day of an outbreak, with the aim of reducing case fatality below 2% within one week, including:

- establishment of a treatment centre and patient transport system,
- identification and training of staff,
- preparation of stocks of drugs and other supplies.

Operations: prevention of diarrhoeal diseases

Provision of safe water

Despite the scattered, remote, inaccessible and extremely muddy working environment, the project managed to install 120 new tube-wells and re-sink 40 others. This task was carried out by local technicians in four teams of two, partly from GUP, supported by MSF logistics and supplies. Local skills and expertise were an important asset. Each team was able to install two to three tube-wells a day. To prevent contamination from surface seepage, the wells were protected by concrete slabs. Where necessary, these slabs were also made for existing wells. The local cost price per tube-well newly installed, including supplies from MSF was 2,000 Taka (US$ 50).

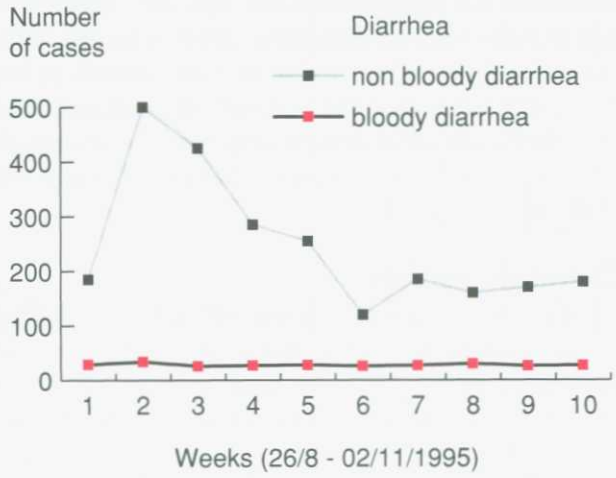
Most of the existing tube-wells in Shib Char were flooded. Existing tube-wells which were accessible were serviced and chlorinated to provide safe drinking water. A total of 1,500 existing tube-wells were treated and serviced. After chlorination, the wells were "locked", usually for 24 hours, until the residual chlorine concentration in the well water was safe for drinking (0.5 mg/l or less). The wells then had to be checked again, as in some cases the rubbers appeared to have been affected by the chlorine.

Building of latrines and decontamination of residential areas

Sanitation activities were also shared with GUP. With financial and logistical support from MSF, GUP implemented a "do-it-yourself" latrine programme in collaboration with the local community. A total of 100 low-cost (US$ 3) and environment-friendly latrines - made from large, locally produced, clay pots called "mokbas" - were distributed and demonstrated to people.

To decontaminate the interior of the houses and latrines of patients treated for diarrhoea in the cholera treatment centre, teams of water and sanitation workers sprayed a chlorine solution. The MSF diarrhoea treatment centre received similar treatment. These procedures were carried out according to the MSF Cholera Guidelines.

Figure 2. Weekly incidence of diarrheas in Shib Char, Bangladesh.



Health education

A total of 14 health and sanitation outreach workers (whose other activities are described below), conveyed essential health messages to the community, particularly in relation to the health risks associated with flooding. Health messages were standardised and also channelled through primary and secondary schools. In remote areas, the use of megaphones proved very useful.

Surveillance and preparation for a cholera outbreak

"Early warning" and "epidemic preparedness" are key strategies to reduce morbidity and mortality for many epidemic diseases. Cholera, as a disease with very rapid onset and high mortality if not treated promptly, is a very good example. The cholera surveillance system used both passive and active components.

Out Patient Department

With the help of MSF staff experienced in refugee health care, there were no problems in establishing 2 OPDs, which functioned from late August. These provided basic medical care for all diarrhoeal diseases and treatment for other diseases in children under 10 years of age.

Cholera Treatment Centre

The CTC was established on one of the few dry sites in Ship Char Tana, which measured 40 x 50 metres. This area could not accommodate our "Trigano" tents, so we had to build bamboo structures. Staff, who had only a theoretical knowledge of cholera were trained, in both theory and practice, in the treatment and management of cholera patients. After a preparatory period of 10 days, the CTC complied both technically and operationally with MSF standard guidelines.

Outreach workers

The active component of surveillance in the mission was provided by outreach workers, who referred suspected cases to the OPDs. Teams of outreach workers had defined areas of responsibility, usually working alongside the sanitation outreach workers (the tube-well teams) and coaching the technical workers. They played an important role in mapping diarrhoea cases, as well as administration and the coordination of logistics.

The activities of the outreach workers were supported by mobile medical teams, who were involved in identification of cases and on-the-spot treatment of mild cases. They also contributed to active surveillance and health education.

Data information system: morbidity and mortality data

The morbidity data collected from the OPDs, CTC and the outreach workers were compiled weekly and sent to Cox's Bazaar for analysis. This surveillance system proved an effective way of monitoring the major causes of morbidity in the flood affected areas.

A total of 15,160 patients were seen during the intervention period. Of all OPD attendants, 18.9% presented with diarrhoea. The other common causes of morbidity were ARI, fever/malaria and skin diseases.

Screening for malnutrition of children under 5 was done in the OPDs. The malnutrition figures obtained were not far different from the overall prevalence in Bangladesh, as described by Hellen Keller International.

Figure 2. shows the weekly diarrhoea morbidity of Shib Char Tana. After week 2, cases declined rapidly to below 200 per week.

During the intervention period, a total of 102 cases of diarrhoea were admitted to the CTC, of which 57 were severe and suspected cholera. In 12 out of 16 cultures performed by the ICDDR B hospital, the diagnosis of cholera was confirmed. Nine of the cases were serotype "O1" and three were type "O139". Because serotype "O1" was resistant to tetracycline and cotrimoxazole, these antibiotics were unsuitable to treat severe diarrhoea. Ampicillin, to which both stains were sensitive, was used as the first line treatment. As cholera is endemic in the area, the figures obtained during the intervention are unlikely to signify an increase in the incidence of cholera. Unfortunately, pre-flooding epidemiological data were not available to substantiate this assumption.

Collection of mortality data proved a more difficult task. As most deaths were reported verbally to outreach workers and the administration of the area was disrupted, the mortality data are not considered reliable. Total reported deaths in the area between the end of August and mid-November were 11, of which 5 were under 5 years of age. In 4 cases, the cause was a diarrhoeal disease. Two children, one with an underlying malnutrition problem, died in the CTC, which brings the fatality rate of those admitted to the CTC with diarrhoea to 2%.

Closure of intervention

By the end of November, the water level had completely receded and most people had returned home. The surveillance data showed a remarkable improvement in the health situation. It appeared that the existing health facilities could now cope. In addition, it was feared that extension of the MSF intervention could give rise to false expectations among the local population.

Based on these considerations, the project was closed down at the end of November 1995. The local counterpart, GUP, undertook the responsibility of further improving the water and sanitation situation. Arrangements were made to maintain communications with GUP and local leaders in case of any renewed deterioration of the situation. Malnutrition was one of the possible long term effects of the flooding that required monitoring. Reassessment of the area by MSF was scheduled after two months.

Conclusions and lessons learned

Despite inherent difficulties in evaluating the impact of the mission in statistical terms, the absence of any serious outbreak of diarrhoeal disease must be regarded as a success. In future, certain aspects of flooding, such as the long term effects on the nutritional status and health situation, deserve exploration.

Our immediate objectives in this mission were achieved, and the collaboration with the local NGO contributed greatly to the efficiency of our operations. With considerable reliance on local staff, technology and expertise

from Bangladesh and the loan of MSF staff already working in the country, the intervention was economically balanced.

In such a disaster prone area as Bangladesh, a sustained emergency preparedness programme would seem particularly desirable This would include maintenance of stocks of materials and standby teams of trained water and sanitation workers in Dhaka, and an ongoing collaboration with local NGOs. Following up on "after care" through a local NGO is also an attractive idea.

Difficulties remain, however, in defining the scope and size of the intervention in relation to the limited resources available, and the risks of epidemics in other flooded areas not covered by MSF which may unexpectedly require additional material and manpower. ■