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A FIELD DAY FOR SMALLPOX IN SIBPUR, BANGLADESH

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INTRODUCTION

Although smallpox is infectious, its pattern of spread is usually slow, in that one person with the disease usually infects not more than three or four other susceptible persons each of whom in turn does the same. Even within an infected household it may take two or three generations of cases for all susceptibles to be exhausted.

In Bangladesh also, particularly in the non-epidemic season, outbreaks in the absence of containment measures usually spread slowly from household to household and from village to village, not producing an alarmingly large number of cases even when outbreaks have been in progress for months.

As such, a recent outbreak in village Sibpur was quite extraordinary in that the spread was explosive in character, with a large number of people contracting the infection from a single common source. A brief account of this unusual outbreak is given below.

THE OUTBREAK

Sibpur is a village of approximately 400 people in Goshair Hat Health Circle of Faridpur District. Ayesha, a 25 year-old woman resident of this village visited relatives in village Bakshampatti about 12 miles away during the Eid festival. In the household visited by Ayesha, there were cases of smallpox. After a day's stay in the infected household, Ayesha returned to her home in Sibpur and 10 days later, on 9 November, developed fever and then rash. Her husband and others in the village reported that the patient had been severely ill with high fever, the rash being confluent on the face and the extremities. They said that the skin formed into blebs and peeled off easily. For them it was an unusual case of smallpox, and many people, mostly neighbours, friends and relatives from nearby villages, came to see her out of curiosity as well as sympathy. Ayesha died on 20 November.

From 24 November, cases began appearing in Sibpur and other nearby villages and within a period of 10 days, from 24 November to 3 December, 31 cases occurred in village Sibpur itself, four cases in village Barakachna, one case in village Malanchara and one case in village Nagerpara. In all, 37 cases occurred, each with a definite history of having visited Ayesha's household while she was ill or to attend the funeral on the day she died.

We came to know of this outbreak on 3 December, while inquiring about possible smallpox cases at a market place four miles away. Investigation began immediately.

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The dates of onset of the primary case, the secondary cases and some of the tertiary cases are indicated in Table 1. Containment action began on 3 December with the help of four health assistants. Before the outbreaks in the four villages could be brought to a halt, 52 cases and 9 deaths had occurred, the last case being on 26 December.

TABLE 1.

Place	Cases	Death
Sibpur	38	7
Barakachna	6	1
Malanchara	2	-
Nagerpara	6	1
Total	52	9

DISCUSSION

A number of circumstances relating to the case, the contacts and the environment appear to have been responsible for the rapid spread of smallpox in this situation.

(a) Infectiousness of the primary case

From the reports it appeared that Ayesha had experienced the 'flat' form of smallpox which, as in her case, is frequently fatal. Epidemiologically, transmission is greatest from such severe or fatal cases.

(b) Susceptibility of the contacts

None of the 37 secondary cases had a primary vaccination scar or history of vaccination; the index case also was said to have been unvaccinated. From inquiries and spot checks of vaccination scars made locally, it was apparent that no vaccination activity had been conducted in the affected villages for more than four years. Thus, the 0-4 year age-group in the area was entirely unprotected and, even among those 5-14 years old, only about 50% were found to have been previously vaccinated.

(c) Density of the population and the degree of intermixing

The overall density of the population in the affected areas is about 1700 persons per square mile. The households are generally one room hutments and the average family size is six members. Related households live in groups, known as baries. Ten such baries in village Sibpur, two in village Barakachna and one each in village Malanchara and Nagerpara were affected. All infected baries except one are very close together, almost in a cluster.

There was no isolation of the index case. At night, the household members slept alongside the case on the floor and visitors were allowed to come and sit by the side of the case. During the investigations, we often saw unprotected children sitting close to acutely ill patients.

The cultural practices are such that there is no bar to neighbours or relatives from different villages visiting the infected households. Women with unprotected children in their arms were often seen visiting the sick. Children of the 5-14 year age-group have particularly free access to any household. Even as we moved from one infected household to another seeing the secondary cases, we had 20 to 30 children trailing us. From the information they could provide us about the cases and deaths it was obvious that they had all come into contact previously with these cases as they would with the index case. The proportion of secondary cases that occurred among this age-group illustrates this:

TABLE 2. DISTRIBUTION OF THE SECONDARY CASES BY AGE AND SEX

Age in years	Male	Female	Total
1	1	-	1
1-4	5	-	5
5-14	9	18	27
15+	2	2	4
Total	17	20	37

CONCLUSIONS

Valuable lessons emerge from this outbreak:

(a) In densely populated areas, a very high level of vaccination immunity should be maintained, particularly among the most vulnerable age-group, i.e. 0-14 years.

(b) A sensitive surveillance system is required so as to ensure that not a single focus of infection can go undetected for long.

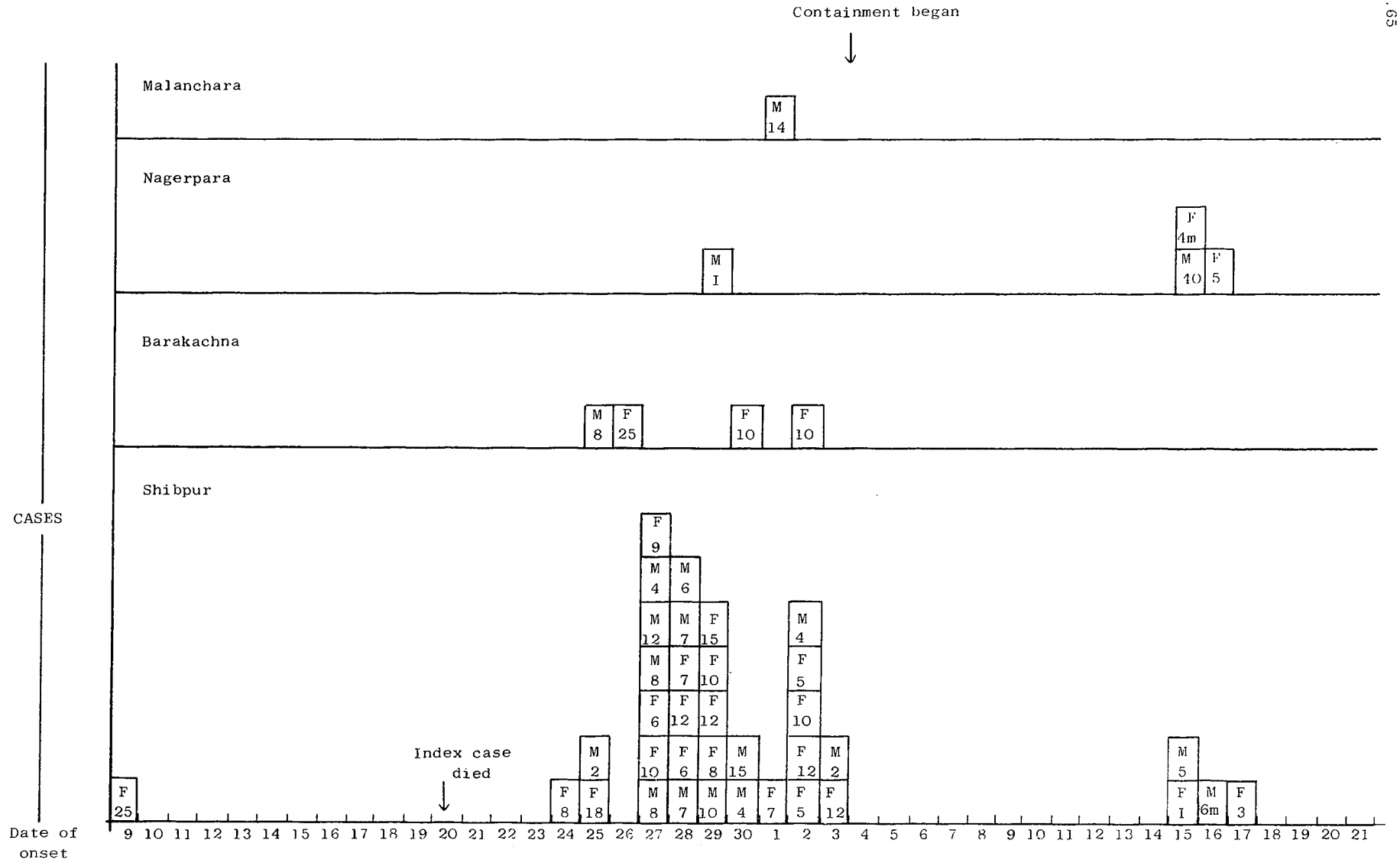
(c) Containment action must be prompt and thorough. Not only the affected bari contacts but also those in the adjacent and related baries should be vaccinated irrespective of their previous vaccination status. Further, it should be ensured that no one is without a primary vaccination scar in the affected and in the surrounding villages.

(d) Forward tracing of those who had come into contact with the patient and then gone away will result in early detection of outbreaks in other localities.

SUMMARY

An unusual outbreak in which 37 persons were infected by a single case has been described. A combination of circumstances, including the age and sex of the index case, its severity, the density and the intermixing of the population, the immense load of susceptibles, the lack of isolation of the index case, and the prevailing cultural practices, facilitated smallpox in having a "field day" as it were, in Sibpur. The task for programme personnel in Bangladesh is not only to see that smallpox does not have such "field days", but also to see that the disease is speedily and completely eliminated from the entire country.

FIG. 1. DATES OF ONSET OF SMALLPOX CASES



F 6 Indicates one case in a female of six years.