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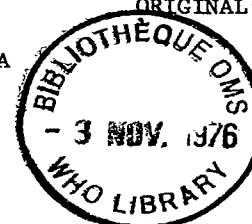
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THE LAST KNOWN OUTBREAK OF SMALLPOX IN INDIA

by

Dr Z. Jezek,<sup>1</sup> Dr M. N. Das,<sup>2</sup> Dr A. Das<sup>3</sup>  
Dr M. L. Aggarwal,<sup>4</sup> and Mr Z. S. Arya<sup>5</sup>



Smallpox, which for centuries has ravaged mankind, was finally vanquished in the country which had been thought to be the cradle of the disease - India. The last outbreak was discovered in Karimganj town, Cachar District, Assam, on 28 May 1975.

A description of the outbreak and the measures taken to contain it provides an indication of the nature and intensity of efforts in the smallpox eradication programme in India which led to elimination of the disease.

Introduction

Epidemiological situation - 1975

At the beginning of 1975, only three countries in Asia remained endemic for smallpox - India, Nepal and Bangladesh. Remarkable progress was being achieved in Nepal and India but in Bangladesh in 1975 because of widespread floods, food shortages and unprecedented migration from the limited remaining smallpox endemic areas, smallpox spread throughout the country. The number of infected villages increased from 91 in November 1974 to over 1200 in April 1975. Fig. 1 shows the situation at the end of May. At that time, smallpox outbreaks in western Bangladesh were decreasing rapidly, but in the eastern districts, the number was increasing. This posed a special threat to the Indian States of Tripura and Mizoram and to Cachar District, Assam State.

In May 1974, India had more than 8600 infected villages, but had only 25 villages infected at the beginning of May 1975. Of these, 18 were located in the Eastern states and in West Bengal, the majority having resulted from importations from neighbouring Bangladesh. By the middle of May, indigenous smallpox transmission appeared to have been interrupted, the last indigenous case having occurred on 17 May.

Importations of smallpox infection from Bangladesh

Between January and May 1975, 32 smallpox cases were imported into the Indian states of West Bengal, Assam and Tripura. All occurred in villages located near to those areas of Bangladesh most infected with smallpox.

The first importations, originating from Mymensingh and Rangpur Districts, were reported in Darrang and Goalpara Districts of Assam State and Jalpaiguri District of West Bengal State, at the beginning of 1975. Throughout the first three months of 1975, the number of smallpox importations into India increased, reaching a peak during March and April, with 10 and nine importations, respectively (Table 1). The sources of infection for these importations were remarkably widely distributed within Bangladesh (Fig. 2).

<sup>1</sup> Dr Z. Jezek, Medical Officer, Smallpox Eradication, WHO, New Delhi.

<sup>2</sup> Dr M. M. Das, District Health Officer, Cachar, Assam.

<sup>3</sup> Dr A. Das, Leader, State Surveillance Team, Assam.

<sup>4</sup> Dr M. L. Aggarwal, Special Epidemiologist assisting Assam Health authorities.

<sup>5</sup> Mr Z. S. Arya, PMA, Central Appraisal Team, Delhi.

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The importations were rapidly detected - 66% having been detected within 15 days after onset of rash of the first case. In the majority of outbreaks, the imported case remained in the village where he first became ill and the history of his recent movements could be determined accurately. Containment activities were generally excellent. In West Bengal and Tripura, nearly half of all outbreaks (47%) consisted of the imported smallpox case only (Table 2). However, in Assam, seven satellite outbreaks occurred in villages adjacent to the index-outbreak.

#### Last known smallpox outbreak in Indian territory

On 24 May 1975, a migrant woman, a beggar, Saiban Bibi, aged 30, developed fever and rash while living on the platform of the Karimganj railway station. She was the last in the series of cases imported into India from Bangladesh. The story of India's last smallpox outbreak is as follows.

The Superintendent of the Civil Hospital in Karimganj, a town bordering Sylhet District of Bangladesh, sent a message to the Cachar District Health Officer on 27 May 1975 concerning a case with fever and rash, suspected to be smallpox. The District Health Officer (Dr M. N. Das) and the Central Appraisal Officer (Dr Z. Jezek) who were working with the Assam State Surveillance Team (Dr A. Das) in the border areas of Cachar and Tripura received the message on 28 May 1975 and immediately went to investigate. On arriving in Karimganj, it was found that the patient had been hospitalized in the isolation ward of the Civil Hospital. The diagnosis of smallpox was confirmed clinically. Specimens for laboratory examination were taken. The outbreak was reported telegraphically to the Assam State authorities in Gauhati as well as to the Directorate General of Health Services in New Delhi and to WHO. The specimen reached the virus laboratory of the National Institute of Communicable Diseases, New Delhi, on 4 June and growth of variola virus was confirmed on 9 June.

Initial investigation revealed an alarming situation. For the first four days of her fever and rash, the patient had remained at the Karimganj railway station, the gateway to Eastern India. It was found that nine trains daily moved out of Karimganj railway station between 22 May and 26 May 1975. Altogether, 4535 railway tickets had been issued to 68 different railway stations. It was feared that a sizeable number of infected contacts might already have dispersed to distant areas of the states of Assam, Tripura and Mizoram. In the first few hours, the following plan was adopted.

- (i) To investigate carefully the movements of the patient, identify the source of infection of her disease and contain the present focus of infection.
- (ii) To start immediate search and containment vaccination in two main foci, wards 17 and 27 of Karimganj City where both the railway station and the Civil Hospital were situated. Later, it would be necessary to expand containment activities over the whole city as well as to all villages visited by the patient from 21 May onwards.
- (iii) To alert immediately the railway authorities to intensify their surveillance activities in and around railway stations and railway colonies.
- (iv) To alert all district health authorities in Assam and neighbouring states, especially those on the railway route, to initiate and to ensure intensive search operations during the following 14 days.
- (v) To start special intensified searches in all villages within 10 miles of the border with Bangladesh to ensure early detection of any further importations.
- (vi) To increase publicity regarding the reward for reporting new smallpox cases in order that a high percentage of the population, particularly those living in high risk areas, would know about the reward and where to report any cases discovered.

Additional isolation measures for the patient were immediately initiated. Four watchguards were placed in the isolation ward for round-the-clock duty. All patients, visitors

and hospital staff, together with their relatives, were enumerated and vaccinated. The Civil Hospital was closed to visitors, the discharge of patients was stopped and admissions were limited to emergency cases only. The movement of hospital staff was limited, controlled and listed. One watchguard was placed at the railway station for surveillance and vaccination.

Three border checkposts were established at Suterkandi, Karimganj and Mahishasam. All incoming and outgoing travellers were checked, vaccinated and, when necessary, cross-notifications of their movements were sent. All Border Security Forces (BSF) and police outposts were alerted to apprehend any further importations.

#### Source of infection for the last smallpox outbreak

Identification of the source of infection did not prove difficult. Questioning of the patient, her contacts and her relatives, revealed that Smt. Saiban Bibi was a resident of the village Takoikona, Thana Bsani Bazar in Sylhet Sadar Subdivision, Bangladesh.

On 10 May, she left her village by bus and on foot and visited the village Itauri, Thana Bariakha, Subdivision Maulvi Bazar in Sylhet District of Bangladesh (Fig. 3). She stayed in this village for four days, in the house of Mr Makades Ali. She stated that she had seen smallpox cases in this village and had heard of deaths occurring there. The cases she saw were on the main road leading through the village. She denied visiting or staying in any affected household or having had face-to-face contact with any patient.

On 13 May, she started her return trip and one day later, arrived back in her village Takoikona. Until 21 May, she stayed in her own village having no contact with anybody living outside the village.

On the morning of 21 May, she left the village and walked to the Indian border. She crossed the border near Latu village and came to Gobindapur village. She passed Fakira Bazar and rested in Akhbarpur village, in the house of Mr Surfan Ali. He was subsequently contacted and questioned and the history confirmed. That same afternoon, Smt. Saiban Bibi reached Karimganj town and went to the railway station where she boarded the train. She reached Baraigram railway station and continued her journey by foot to Nalukandi village, to the house of Mr Illias Ali. After staying and begging in Nalukandi village, she came back to Bariagram railway station late in the evening. That night, while sleeping on the platform, she developed severe fever. The next morning she returned by train to Karimganj railway station. At Karimganj, she remained shivering with fever from 22 to 25 May. Sometimes, she lay on the railway platform, sometimes in a third class waiting room. She first noticed rash on the morning of 24 May. On 24 and 25 May, she remained in the third class waiting room, lying on the bench and leaving only to obtain tea at a tea-stall approximately 10 m away. On the morning of 26 May, her symptoms became worse and she was advised by passengers to visit the Karimganj Civil Hospital. She left the railway station and walked on foot, through four wards of the town to the Civil Hospital. She was seen by the vaccinator who informed the Superintendent that there was a patient with severe fever and rash. She was promptly isolated in the isolation ward of the hospital.

On 28 May, cross-notification concerning the source of infection was sent by the Cachar District Health Officer to the Chief Medical Officer in Sylhet. The village Itauri was visited and an epidemiological investigation carried out. It was found that the village had been affected by smallpox during the months of April and May 1975. A total of six smallpox cases and one death had been reported from the village during that period. The first case occurred on 16 April and the last on 14 May. The outbreak had been reported on 1 May. All smallpox cases had occurred in one household situated at the edge of the village by the side of the only road leading through the village.

#### Containment activities and search operations

Containment vaccination, including enumeration of the population living in wards No. 17 and 27, started during the afternoon of 28 May when about 1000 persons, suspected to be close

contacts of Smt. Saiban Bibi, were vaccinated. During the next few days, containment vaccination gradually expanded throughout Karimganj town and the following results were obtained:

Description	Ward No. 17	Ward No. 27	Karimganj town total
Household enumerated	178	227	5 141
Population enumerated	1 097	1 456	33 544
Persons vaccinated	1 217 <sup>a</sup>	1 531 <sup>a</sup>	26 940
Primary vaccinations	15	37	1 979
Revaccinations	1 202	1 494	24 961
Percentage of primary vaccination	1.2	2.4	7.3
Temporarily absent	48	61	4 471
Permanently absent	3	4	221

<sup>a</sup> Includes persons vaccinated in the railway station and in the Civil Hospital, but not living in wards 17 and 27.

Persons living in the villages of Fakira Bazar, Akhbarpur and Nalikandi, as well as those living in Baraigram railway station were also carefully checked and vaccinated.

During the period when secondary cases and satellite outbreaks were expected, three active search operations were conducted in Karimganj town under the strict supervision of the Central, State and Special Surveillance Teams. The results of these search activities can be summarized as follows:

No. of search	Dates	No. of houses			Smallpox cases detected	Chickenpox cases detected
		Total	Searched	% searched		
First	7-11.6.75	5 355	4 486	83.8	0	16
Second	22-26.6.75	5 355	5 028	93.9	0	12
Third	3-07.7.75	5 355	5 355	100.0	0	9

No smallpox cases were found during the three search operations. An assessment survey conducted on 8 July revealed that 88% of the persons interviewed, knew about the searches and had met the searcher; 76% knew about the reward for reporting unknown smallpox cases; and more than 66% knew exactly where to report any suspected cases.

Three independent special border search operations were carried out, in the 801 villages of Cachar District which are situated within 10 miles of the Bangladesh border. The first border search was performed from 2 to 14 June; the second from 3 to 12 July, followed by the third from 4 to 13 August.

The results of the first search were as follows:

Name of PHC/Block	No. of villages		Smallpox cases	Chickenpox	
	Total	Searched		Outbreaks	Cases
Kachudan PHC (Mahakhal Block)	112	112	0	0	0
Dasgram St. Disp. (North Karimganj)	128	128	0	8	24
Nilambazar PHC (South Karimganj)	221	221	0	69	105
Patherkandi PHC (same block)	215	215	0	3	5
Jallalpur (Katigorah)	125	125	0	25	173
Total	801	801	0	105	307

No case of smallpox or any suspected to be smallpox was found during either the second or the third search operation. Fig. 4 shows the map of Cachar district and the areas selected for special border search operations.

An assessment survey organized in these 801 villages revealed that over half of those interviewed knew of the searches and had met the searcher, had seen the recognition card and knew about the reward.

Five active search operations, utilizing the entire public health staff, were conducted in all parts of Cachar district and simultaneously throughout Assam State. The result of these searches can be summarized as follows:

Dates	Areas	No. of villages		Municipalities		Smallpox cases	Chickenpox	
		Total	Searched	Total	Searched		Outbreaks	Cases
19-28.5.75	Cachar	2 350	2 350	4	4	0	261	1 207
	Assam	22 817	22 604	45	0	0	3 611	13 318
20-28.6.75	Cachar	2 350	2 350	4	4	0	157	548
	Assam	22 817	22 254	45	45	0	1 808	4 650
22-31.7.75	Cachar	2 350	2 339	4	4	0	39	82
	Assam	22 817	22 544	45	45	0	756	143
20-28.8.75	Cachar	2 350	2 344	4	4	0	34	47
	Assam	22 817	22 467	45	44	0	545	1 885
22-30.9.75	Cachar	2 350	2 268	4	4	0	44	56

An assessment survey conducted in Cachar district at the end of July showed that 86% of 8311 persons interviewed knew about the latest search; 81% knew about the reward; and 77% knew where to report suspected cases.

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Thirty-one railway stations and colonies were searched and searchers investigated 24 475 households. Only 48 chickenpox cases were detected and subsequently verified. Similar search operations were also carried out in the neighbouring states of Tripura, Mizoram and Manipur. No further smallpox cases were discovered.

On 4 July 1975, Smt. Saiban Bibi, the last smallpox case, was discharged from the isolation ward of Karimganj Civil Hospital and the same day she departed to her own village Takoikona in Bangladesh. Surprisingly, the last known smallpox outbreak consisted only of a single case, thus bringing to an end in India, the death, blindness and disfigurement caused by the dreaded disease - smallpox.

TABLE 1. SMALLPOX IMPORTATIONS FROM BANGLADESH  
DISCOVERED AND REPORTED IN INDIAN STATES (1975)

Month	Affected states			Total No. of importations
	West Bengal	Assam	Tripura	
January	1	4	0	5
February	1	0	1	2
March	7	3	0	10
April	7	1	1	9
May	3	1	2	6
June	0	0	0	0
TOTAL	19	9	4	32

TABLE 2. PERTINENT DETAILS OF SMALLPOX OUTBREAKS IN INDIA  
RESULTING FROM IMPORTATIONS FROM BANGLADESH (1975)

Items	Affected states			Total
	West Bengal	Assam	Tripura	
No. of affected districts	7	4	2	13
No. of Importations (Index-outbreaks)	19	9	4	32
Outbreaks with imported case only	58%	22%	50%	47%
Average No. of cases per outbreak	2.3	8.1	2.2	3.9
Time-lag between onset of first case and reporting (days)	11.2	15.7	15.2	13.0
No. of satellite outbreaks	1	7	0	8

BANGLADESH - WEEK NO. 22 (1975)

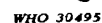


FIG. 2. IMPORTATIONS OF SMALLPOX INFECTION FROM BANGLADESH (1975)

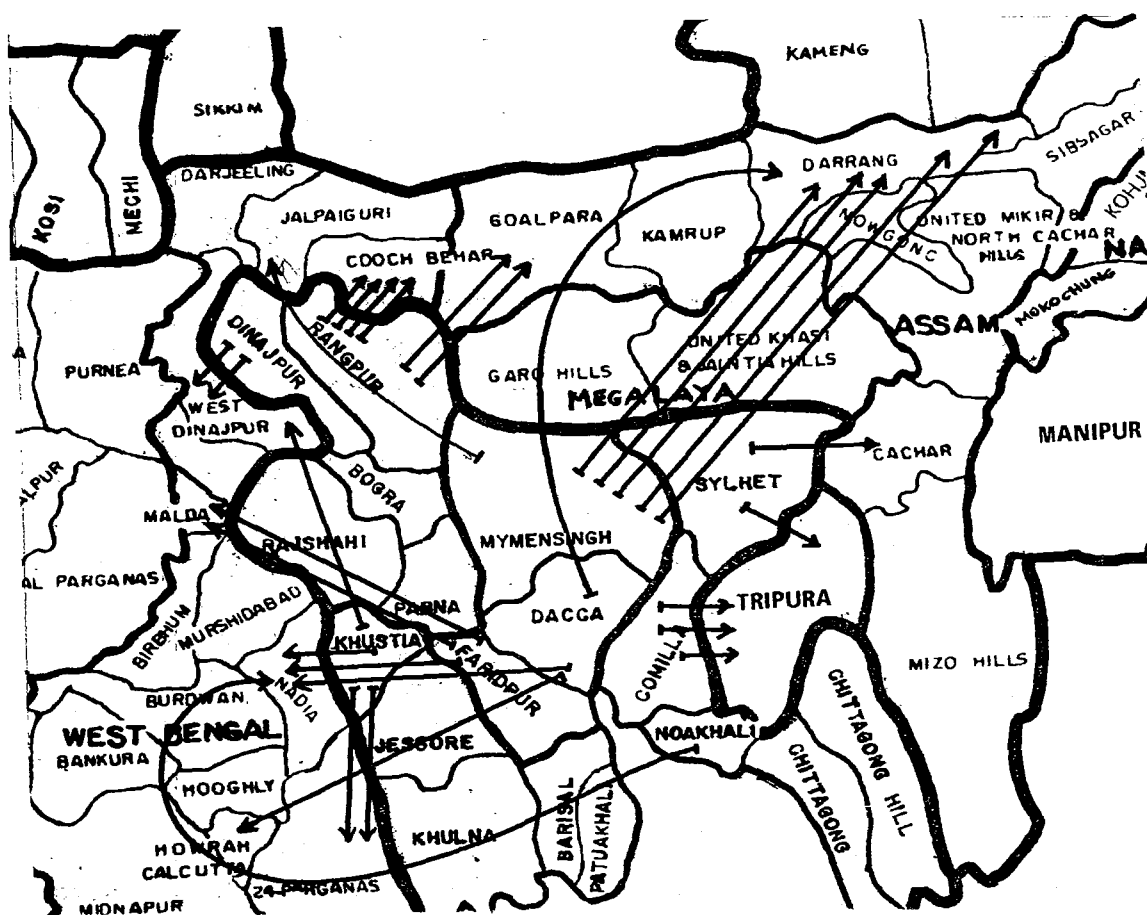


FIG. 3. LOCATION OF THE LAST SMALLPOX OUTBREAK IN INDIA  
KARIMGANJ TOWN, DISTRICT CACHAR, ASSAM STATE  
MOVEMENT OF SAIBAN BIBI, 13-22 MAY 1975

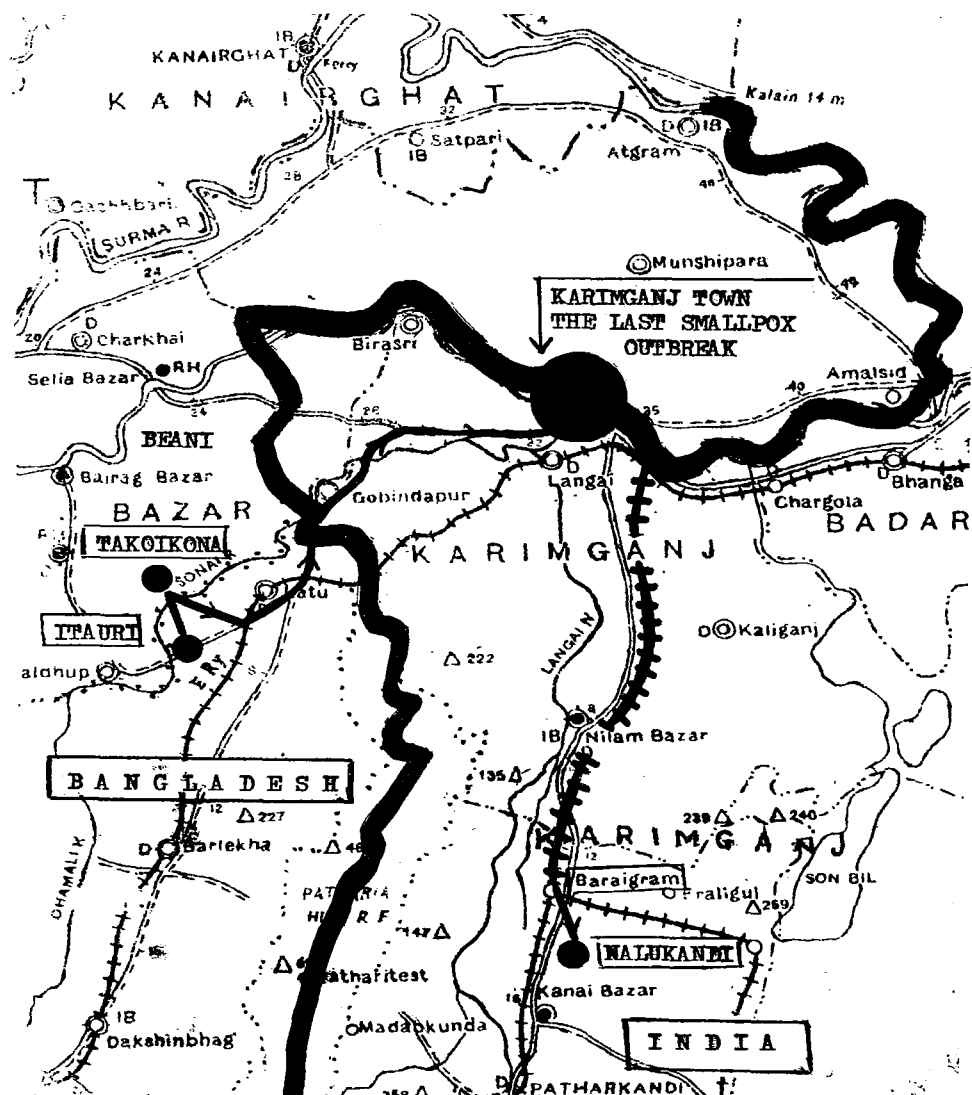


FIG. 4. CACHAR DISTRICT (ASSAM) AREAS SELECTED FOR BORDER SEARCH

