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THE PRESENT STATUS AND FUTURE PLANS FOR THE
BANGLADESH PROGRAMME

by

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1. INTRODUCTION

In 1968, the Government of Bangladesh, with assistance from the World Health Organization launched a national smallpox eradication campaign. The first objective, interruption of transmission, was virtually, if not entirely, achieved during the last quarter of 1970 and no cases of smallpox were detected through December 1971. However, as a consequence of the disturbances of 1971, programme activities were hampered, especially during December 1971 and January 1972. After liberation, the simultaneous repatriation of infected refugees resulted in massive multiple introductions of smallpox into the country. In February 1972, the Bangladesh Smallpox Eradication Programme was re-established as an emergency programme. The areas of smallpox were identified, the available resources for surveillance and containment were determined and outbreak control operations were started. This programme also provided a framework on which further actions were planned and developed.

2. SMALLPOX SITUATION

A - BACKGROUND INFORMATION

Prior to the disruption of the programme, mass vaccination programmes had been initiated in 10 Districts (Figure 1). Assessment data of the target population, 0-14 years, are available for 16 Sub-divisions (Table 1). Concurrently with the development of the mass campaign an active programme of outbreak investigation and control was initiated.

As a result of the military action during 1971, an estimated 10 million persons left the country for neighbouring parts of India. Relief efforts there were initiated to feed, clothe and provide medical care. Smallpox vaccination was included in this programme and high levels of coverage were obtained in some camps. In 1971 smallpox broke out in epidemic form in some refugee camps in West Bengal. The simultaneous occurrence of the liberation of Bangladesh and the repatriation of vast numbers of infected refugees resulted in multiple smallpox importations. Efforts to vaccinate in the camps and at transit points together with quarantine procedures, were ineffective in stemming the flow of infected cases into Bangladesh.

B - EPIDEMIOLOGICAL CHARACTERISTICS

1. Cases

As of September 1972, 7 744 cases, including 2 249 deaths, have been reported. Three different assessments carried out in March and June have shown the efficacy of the reporting system to be 10% and 20%, respectively.

2. Geographic distribution

Of 7 744 cases reported during 1972, 7 146 (92%) occurred in four Districts: Rangpur, Barisal, Khulna and Faridpur (Figure 2). Of 409 thanas in Bangladesh, 88 have experienced smallpox cases. Up to September, 36 thanas were still infected, while in 52 thanas the situation seems to have been controlled (Table 2).

3. Mortality

The recorded mortality rate during the present epidemic is 29%. This rate is lower than those reported in previous years, reflecting improvement in the reporting system. In 1960 it was 70%; in 1971, 32%, and, during the early stages of the present epidemic, 40%. As the country simultaneously experienced a chickenpox epidemic this year, it is probable that mild cases of smallpox were initially misdiagnosed as chickenpox during the epidemiological investigations. In the outbreak in Khulna town, investigated by well trained staff, the mortality rate was 28%. Similarly, in the four outbreaks in which every case has been investigated by an epidemiologist, the overall case-fatality rate is 28.4%, the highest rate occurring in the 0-4 group (Table 3).

4. Vaccination status of cases

As expected, over 80% of the cases were unvaccinated prior to exposure (Table 4). In the infected households of Khulna, the secondary attack rate for those unvaccinated was 61.6% and for those with a scar, 8.1%.

5. Pattern of transmission

During the investigations carried out in March 1972, it was estimated that 90% of the cases occurred in returnees and their families. At that time in Rangpur, 64% of all cases within a family were primary or co-primary cases (Table 5). The same situation was observed in Khulna and Faridpur, suggesting that extra-familial transmission was most important. The age distribution of cases supports this impression. In the early outbreaks (January, February, March) the 0-14 year age group accounted for 60% of the cases. In later outbreaks the proportion increased to 70% and 81% (Tables 6, 7 and 8) suggesting a return to an "ordinary" pattern of transmission.

3. BANGLADESH SMALLPOX ERADICATION PROGRAMME

A - ADMINISTRATION

The Smallpox Eradication Programme is a separate unit within the Directorate of Health Services directed by an Assistant Director of Health Services (ADHS-SEP). The programme has positions for three Medical Officers, Sanitary Inspectors (on deputation) and a supporting administrative and clerical staff. The central staff is responsible for nation-wide direction, coordination and assessment of the Smallpox Eradication Programme. The programme requires the active assistance of field health staff, most of whom are Government employees and the rest are District Council and Municipal employees.

B - REPORTING SYSTEM

Each Government Health Assistant is responsible for case detection in one Union (population about 15 000). They submit weekly reports to the Sanitary Inspectors. The Sanitary Inspectors report weekly to the SDMOH's; these reports are compiled and are forwarded to Headquarters. Newly detected cases are notified by cable. Although there are some postal difficulties, it is possible for the weekly reports to reach Headquarters within 10 days. Figure 3 gives an idea of the reporting system during 1972. Energetic action taken at the beginning of August increased the number of submitted reports.

C - TRANSPORT AND SUPPLIES

The mobility of the teams, absolutely essential to the achievement of eradication, has been seriously hampered as a consequence of the recent conflict. A large percentage of the transport was damaged, lost or stolen. For instance, only 39% of the existing vehicles are now in working condition. However, arrangements have been made by the Government with WHO and the United Nations Relief Operations to provide necessary funds for the required additional supplies, including vehicles, motorcycles, refrigerators, vaccine production items, etc.

C - VACCINE PRODUCTION AND DIAGNOSTIC LABORATORY

The Institute of Public Health in Dacca can produce 2 million doses of high quality freeze-dried smallpox vaccine per week. Up to August 1972, a total of 29 million doses have been produced and delivered to the field.

Arrangements are now being finalized for establishment of diagnostic laboratory facilities. Proper precautions have been taken to keep this laboratory completely separate from that of the Vaccine Production Laboratory and to operate it with a separate staff.

4. STRATEGY OF THE ERADICATION

A - WHAT HAS BEEN DONE

During the early stages of the smallpox re-introduction, the Bangladesh Government concentrated its efforts on vaccination in the returnee camps and transit points. An additional 3 800 vaccinators were recruited on a temporary basis and a mass vaccination campaign was launched. However, the simultaneous repatriation of large numbers of infected returnees overwhelmed the capacity of the Health Services system. Failure to identify all the cases and to vaccinate the contacts quickly, added to the low immunity level of the resident contacts, led to the development of major epidemics.

In March 1972 the Smallpox Eradication Unit at Mohakhali was re-established by the Government with the technical assistance of WHO, as part of the United Nations Relief Operation. An assessment of all Sub-divisions was immediately undertaken to ascertain the overall situation. In April 1972 all central teams along with the local staff began a major control operation consisting of improvement of the reporting system, active search for cases, and outbreak containment. As a result, the number of reported cases increased from 1 298 to 5 611 within one month. Containment measures were taken immediately but smallpox transmission could not be interrupted due to the magnitude of the problem.

In June 1972, with the departure of the WHO Temporary Adviser and the beginning of the monsoons, it was decided that the field strategy for smallpox eradication should consist of three combined operations:

- outbreak containment operations in the infected areas until the end of the monsoon
- mass vaccination campaign in the four heavily infected Districts
- establishment of a smallpox surveillance system at thana, sub-divisional, divisional and central levels

As part of the first operation a new plan of action was worked out for the infected areas taking into account the changed situation in population mobility, transportation facilities and the effect of the monsoon on smallpox incidence. In each infected Sub-division, one surveillance team consisting of one SDHI and one Sanitary Inspector was established. The central teams organized the local staff to carry on an active search for cases and appropriate containment measures. In each infected thana, the vaccinators were grouped into three-man teams. An advance tour programme was prepared and the infected villages were planned to be 100% covered, one by one. In addition, in each infected thana two more teams were created, one for supervision and one for follow up.

During that time, the regular staff of the non-infected Districts were encouraged to carry on the surveillance activities by themselves. However, whenever a case was reported, central teams were assigned to organize and assess the containment measures. Although there have been some set backs due to unavoidable circumstances, the scheme is clearly working. It is accepted now that it can put the situation entirely under control provided the planned effort continues to be implemented.

B - WHAT WILL BE DONE

In June 1972, it had been planned that several special measures would be taken after the monsoon containment activities:

- 1) Mass vaccination campaign in the four heavily infected Districts

It is now clear that eradication through systematic mass vaccination is not feasible. The strengthening of the containment measures appears more likely to succeed.

- 2) Establishment of a surveillance system in the non-infected Districts, with thana, Sub-divisional, Divisional and Central components.

To speed up the eradication effort, a few well organized teams will be in charge of zones larger than Sub-divisions. The Sub-divisional teams will be progressively established according to the epidemiological situation.

1. In the major infected Districts

The orthodox principle of blind, systematic vaccination has already been given up. The Smallpox Eradication Programme intends to launch as soon as possible an active operation basically strengthening and extending the emergency plan executed during the monsoon. It has three components: case-finding, containment, and follow-up. All of these will be under close supervision and continuous assessment. On average one group of 50 vaccinators and five Assistant Health Inspectors will be established in each Sub-division under operation. Their activities will be planned by HQ and the local SDMOH. One Sanitary Inspector will be in charge of the operation.

The group will be split into five ten-man teams, each of them headed by one Assistant Health Inspector. Each team will be sent to one infected thana. Six of the ten vaccinators will visit each village looking for smallpox cases. As soon as cases are found, the name of the infected village will be reported to the team leader. The remaining four vaccinators of the team will immediately start to vaccinate every contact. The six vaccinators, after visiting all villages, will be engaged in the same vaccination effort. As soon as the infected villages are covered, the vaccinators will proceed to the remaining villages, always giving priority to primary vaccinations. In addition to this, one follow-up team of two vaccinators will be set up in each infected thana under the responsibility of the Assistant Health Inspector. They will visit each village covered, two weeks after completion of the work, to list the total number of additional cases and to vaccinate those still unprotected, if any. One further visit will be made six weeks after the onset of the last rash. In the non-infected thanas similar active search will be performed. If no case is found, the teams will start a vaccination programme giving priority to primary vaccination. In smallpox-free areas, follow-up teams will not be employed.

One surveillance team has already been created in each infected Sub-division under the monsoon operation. Another team, consisting of one Sanitary Inspector and one Government Health Assistant, will be organized for assessment.

Additional surveillance teams are to be assigned to non-infected Sub-divisions of infected Districts because of the high probability of smallpox importation from the infected Sub-divisions. The surveillance teams will carry out, along with the regular staff, an active search in the thanas reported to be free of smallpox. If smallpox cases are detected, the surveillance teams will organize and participate in the containment measures. They also will be responsible for the maintenance of the smallpox-free status of the Sub-division. Each of these surveillance teams will be composed of one Sub-divisional Health Inspector and three vaccinators.

2. In the non-infected Districts

The non-infected districts are having troubles due to the constant importation of smallpox cases but thanks to the gradual improvement of surveillance activities since January, these importations have been systematically contained. However, it is clear that the re-infection threat will persist as long as smallpox continues in the neighbouring areas. During the military operations of last year, routine work had been significantly hampered in the border areas and the subsequent low immunity level of the population constitutes a permanent threat. Similarly, the high mobility of the population after the monsoon creates ideal conditions for the dissemination of the disease.

Although the local health authorities have been warned and seem to be quite aware of these facts, more energetic action will be required to achieve the early detection of new outbreaks. For this purpose an extensive case-finding operation will be organized, launched, coordinated and assessed by Headquarters. Four teams of one Sub-divisional Health Inspector and three Sanitary Inspectors, working directly under the responsibility of one Medical Officer from Headquarters, will be created. They will receive facilities to move freely and will be stationed at Jessore (area of action: Jessore and Kushtia), Bogra (area: Dinajpur, Bogra, Pabna and Rajshahi), Dacca (area: Dacca, Tangail, Mymensingh) and Comilla (area: Sylhet, Comilla, Chittagong, Noakhali and Chittagong Hill Tracts).

They will have three basic tasks to perform:

- to carry out directly an active search for cases
- to organize the containment measures when cases are detected
- to improve the existing smallpox control system

These teams will be moving continuously, contacting the health authorities, visiting the IDH, schools, markets, cemeteries, areas of poor coverage, etc., and enquiring about the presence or absence of smallpox cases. They will check all information received from any source, including radio and newspapers. If smallpox cases are found they will adopt containment measures according to the SEP techniques of smallpox control. For each situation they will evaluate the adequacy of the available manpower to cope with the task of outbreak control. In addition they will attend, whenever possible, the weekly meetings of the thana staff to establish a permanent active search for cases and to gear up the vaccination of inadequately covered populations. Special attention will be given to the border problems.

In future this system might be expanded by the recruitment, training and progressive establishment of Sub-divisional teams in charge of smallpox surveillance and control at a Sub-divisional level. This would be merged with the health services when established.

Table 9 summarizes the staff to be assigned to the different levels of the programme.

5. CONCLUSION

After analysis of the present epidemiological situation, the Bangladesh Smallpox Eradication Programme decided to concentrate the efforts in surveillance activities.

In the non-infected areas permanent active search for cases and improvement of the reporting system will be the priorities.

In the infected areas, the strategy will shift from systematic vaccination to a major containment operation based on surveillance components.

It is expected that this plan will speed up the eradication and will create a suitable structure to maintain the future smallpox-free status.

TABLE I
CONSOLIDATED ASSESSMENT REPORT BY SUBDIVISION
(UP TO NOVEMBER 1970*)

District	Subdivision	No. Assessed	No. Vacc.	% Coverage
Dacca	Sadar	REPORT	NOT	AVAILABLE
	Narayangonj	7 436	5 366	72.2
Faridpur	Sadar	14 898	12 135	81.5
	Madaripur	1 748	873	49.9
	Gopalgonj	19 113	11 049	57.8
	Goalando	11 870	8 829	74.4
Jessore	Sadar	14 246	11 070	77.7
	Jhenaidah	6 146	4 224	68.7
	Magura	7 042	5 973	84.8
	Narail	REPORT	NOT	AVAILABLE
Pabna	Sadar	16 090	13 085	81.3
	Serajgonj	21 428	19 284	90.0
Bogra	Sadar	7 847	5 096	64.9
Kushtia	Sadar	8 726	7 260	83.2
	Meherpur	12 666	9 160	72.3
	Chuadanga	10 705	8 541	79.8
Dinajpur	Sadar	37 001	30 473	82.4
	Thakurgaon	41 533	25 823	62.2
Total		238 495	178 241	74.7

* 0-14 age group only.

TABLE 2
SMALLPOX GEOGRAPHICAL DISTRIBUTION
BANGLADESH 1972

Area	THANAS			
	Total No.	INFECTED IN 1972		
		Total	Still infected	
			No.	%
Khulna, Faridpur, Barisal & Rangpur	103	58	33	57
Remaining Districts	306	30	3	10
TOTAL	409	88	36	41

TABLE 3

SMALLPOX MORTALITY BY AGE GROUP OUTBREAKS INVESTIGATED BY EPIDEMIOLOGISTS - 1972

Outbreak	A G E G R O U P							
	0 - 4		5 - 14		15+		Total	
	Cases/Deaths	%	Cases/Deaths	%	Cases/Deaths	%	Cases/Deaths	%
Rangpur	13 / 8	61.5	31 / 3	9.8	46 / 12	26.1	90 / 26	28.9
Rajshahi	15 / 8	53.3	26 / 3	11.5	8 / 1	12.5	49 / 12	24.5
Faridpur Town	32 / 9	28.1	27 / 3	11.1	1 / 0	-	60 / 12	20.0
Kotawalipara	42 / 19	45.2	47 / 15	31.9	42 / 10	23.8	132 / 44	33.3
TOTAL	102 / 44	43.1	131 / 24	18.3	97 / 23	23.7	331 / 94	28.4

TABLE 4

SMALLPOX CASES AND VACCINATION SCAR: OUTBREAKS INVESTIGATED
BY EPIDEMIOLOGIST - 1972

Outbreak	Total No. of cases	Among unprotected*	
		No.	%
Rangpur	68	45	66.2
Rajshahi	49	42	85.7
Faridpur Town	60	59	98.3
TOTAL	177	146	82.5

* Without vaccination scar and including deaths

TABLE 5

PERCENTAGES OF PRIMARY AND CO-PRIMARY CASES
RANGPUR - 1972

Age group	No. of cases	Primary or co-primary cases	
		No.	%
0-4	13	6	46
5-14	31	18	58
15+	46	34	74
TOTAL	90	58	64

TABLE 6

SMALLPOX CASES BY AGE GROUP-EARLY OUTBREAKS-BANGLADESH 1972

District	0 - 14 yrs		15 +		TOTAL
	No. cases	%	No. cases	%	
Barisal	140	67	69	33	209
Faridpur	91	57	69	43	160
Rangpur	44	49	46	51	90
Total	275	60	184	40	459

TABLE 7

SMALLPOX CASES BY AGE GROUP-MIDDLE OUTBREAKS-BANGLADESH 1972

District	0 - 14 yrs		15 +		TOTAL
	No. cases	%	No. cases	%	
Rajshahi	41	84	8	16	49
Barisal	133	67	66	33	199
Faridpur	51	68	24	32	75
Total	225	70	98	30	323

TABLE 8

SMALLPOX CASES BY AGE GROUP-LATE OUTBREAKS-BANGLADESH 1972

District	0 - 14 yrs		15 +		TOTAL
	No. cases	%	No. cases	%	
Faridpur	71	90	8	10	79
Pabna	38	68	18	32	56
Total	109	81	26	19	135

TABLE 9
SEP STAFF BY LEVEL
BANGLADESH - 1972

Level	Infected areas	Non-infected areas
Thana	10 GHA + 1 AHI 1 follow-up team: 2 GHA	Regular staff
Sub-division	1 SDMOH 1 SI (Operations) 1 Surveillance team: 1 SDHI 1 SI (Assessment) 3 GHA	1 SDMOH 1 SDHI (or SI)
District	CS or CMOH DHO HEO	CS or CMOH DHO HEO
Regions (Dacca, Comilla, Bogra, Jessore)		1 SDHI 3 SI (from RHC)
HQ	2 MO 3 SDHI	1 MO 1 SDHI
	1 ADHS 2 WHO ADVISERS	

FIGURE 1

DISTRICT VACCINATED 1968-71
BANGLADESH

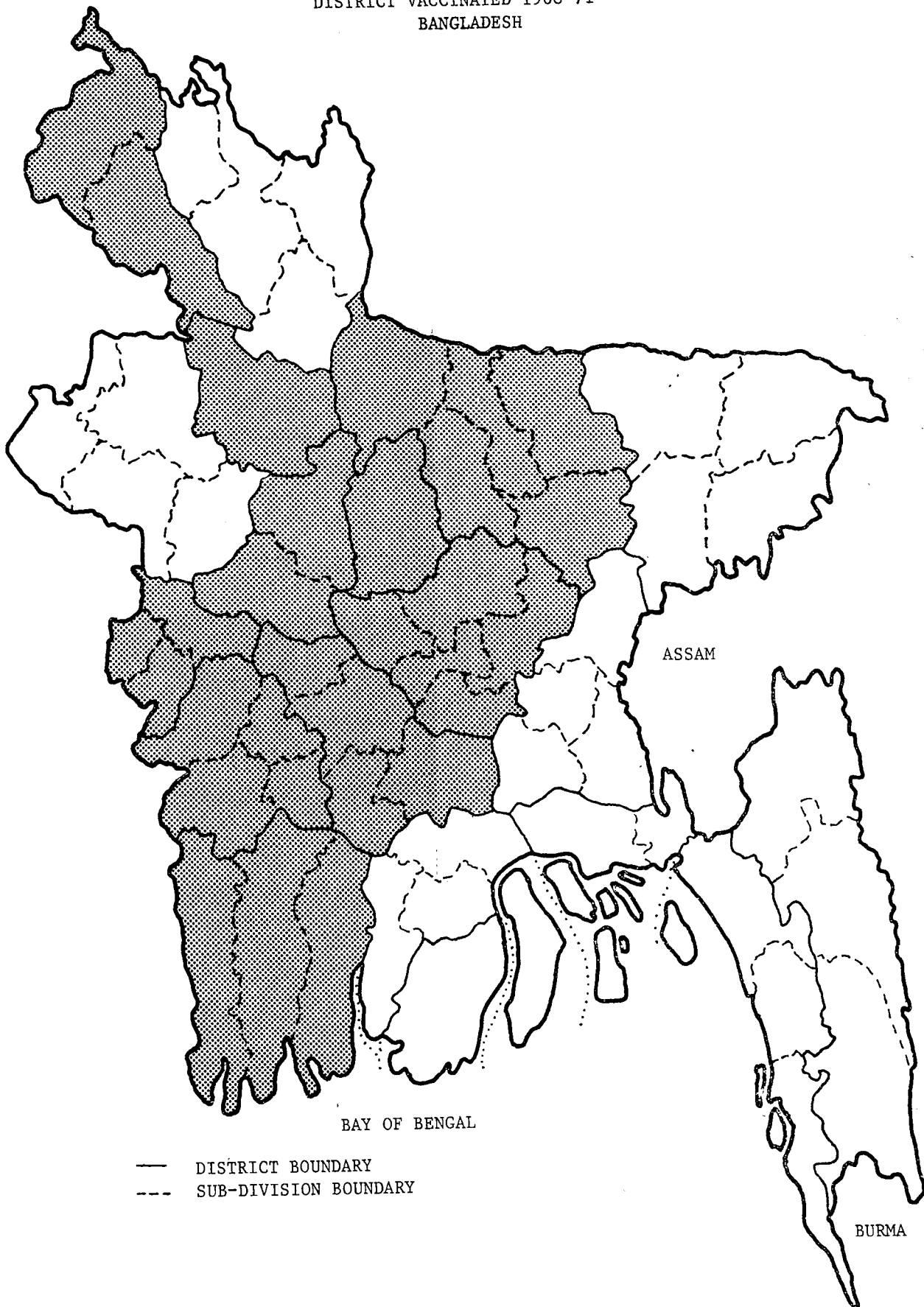


FIGURE 2

BANGLADESH
INFECTED AREAS - 1972

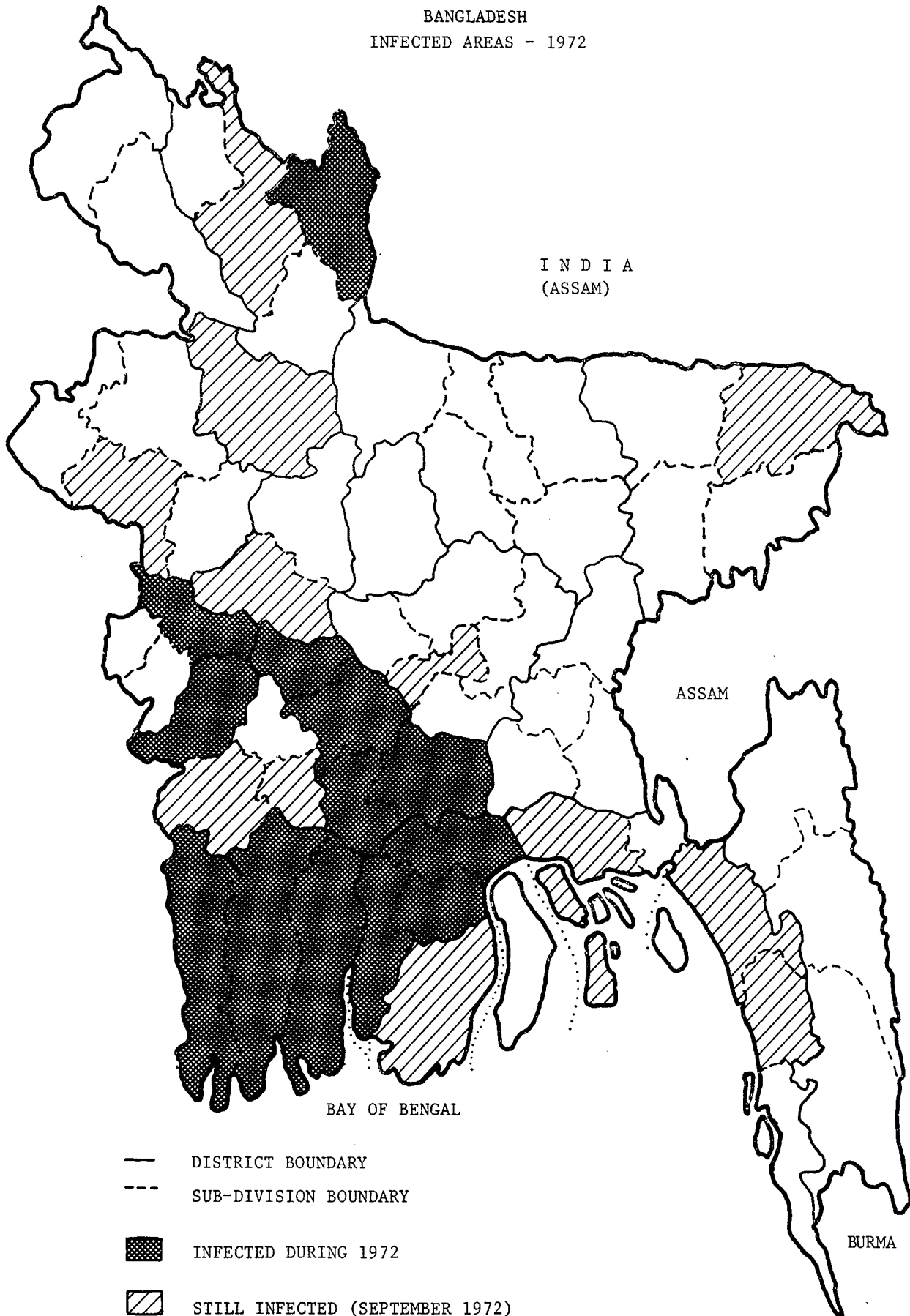


FIGURE 3
 WEEKLY REPORTS RECEIVED BY SEP HQ'S
 BANGLADESH - 1972

