



TRAINING SEMINAR ON SMALLPOX ERADICATION

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SMALLPOX ERADICATION PROGRAMME PUNJAB 1972  
THREE YEARS OF EXPERIENCE IN PUNJAB PROVINCE

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Introduction

Punjab Province comprises the largest portion of the population of Pakistan and, due to its very location, contributes heavily to the overall smallpox incidence of the country. Keeping this fact in mind, the eradication campaign in Pakistan was initiated in Punjab Province in June 1969. Mass vaccination of the population had been adopted as a primary objective during the attack phase and was accomplished by June 1971 - within two years. About 1 600 field workers performed 25 521 904 vaccinations; 1 157 566 of these were primary vaccinations. Assessment results varied significantly from district to district - some as low as 60% (Table 1).

However, despite generally good vaccination coverage of the population, the goal of this expensive campaign was not achieved: active virus transmission was not interrupted. Moreover, the number of reported cases has sharply increased with the start of the Smallpox Eradication Programme - a direct consequence of field activity of the programme staff (Table 2). Although surveillance was not emphasized during the early stages, District Smallpox Eradication Officers were able to discover cases by the very fact of their presence in the field.

Reporting system

The logical step was to establish a unified reporting system. The presence of two parallel channels of notification to WHO/HQ (i.e. the WHO office and the National Health Service), inevitably led to discrepancies. In the beginning of 1971, the Central Ministry of Health agreed to the proposal by WHO to create a reporting setup with the Provincial Smallpox Eradication Office as the central reporting unit responsible for collection, compilation, analysis and distribution of data. The sending of routine weekly telegraphic reports to this office was introduced, including negative reports, in order to involve and interest the District Health Officer in the programme. Reporting can now be regarded as satisfactory: 80.8% of required cables are now being sent, compared to 44.8% in 1971.

Surveillance activity

Surveillance acquired proper emphasis only in the second half of 1971. Eight assistant superintendents of vaccination were deputed for this purpose and trained during a week's

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course in May 1971. Active case search resulted in an immediate increase in cases.

The ratio between reported and detected cases for 1971 was 1:3 and for 1971 (September) 1:2 (Table 3). Upon completion of the mass vaccination campaign, the staff of the programme was reduced, so nearly all activity is now concentrated on active search and containment of cases. During 1972, surveillance teams have checked 2 000 communities out of a total of 22 000 in Punjab. This active approach to the problem has resulted in earlier case detection. During 1972, 87% of cases have been discovered within two months of onset and 73% within one month (Table 4). The reduction of the time gap between the onset of disease and date of detection is a decisive factor in this phase of the programme. Of 210 outbreaks recorded this year, 89% have been contained within two months (Table 5).

#### Epidemiological trends

Reported incidence for 1971 has been characterized by wide variations between the maximum and minimum figures. For instance, 456 cases were reported in June 1971 whereupon the number dropped sharply to 22 cases within two months. The maximum variation for 1972 is 218 cases reported in May and 41 in September (Figure 1). To date the number of cases for 1972 is about 500 less than for the corresponding period of 1971, about a 30% reduction.

The geographical distribution of cases demonstrates two main features: 1 052 cases have been investigated in four districts of central-eastern Punjab bordering India, and in four southern districts adjoining Sind. This is 83% of the total incidence. An overwhelming majority of cases in the first large foci were indigenous, whereas in the second foci they were a consequence of frequent reintroductions from Sind. The four districts of Lahore Division have contributed heavily to the overall incidence of smallpox, reporting almost 50% of all cases this year. The provincial capital has been causing the most trouble and has been serving as a source of infection for the surrounding countryside. Therefore, in May-June, the surveillance campaign was strengthened in Lahore City and in Gujranwala and Sialkot Districts. Four surveillance teams were deputed in Gujranwala and a separate surveillance scheme was organized in Lahore City (described in a separate paper).

All these efforts have brought certain positive developments: during the past three months no cases have occurred in Gujranwala or Sialkot Districts and the last case in Lahore died two months ago. It is believed that with the elimination of the disease from this part of the province, indigenous smallpox ceased to exist in Punjab.

However, the situation in the districts bordering Sind gravely concerns us. Mass vaccination was accomplished there in June 1971 and just afterwards an immense flare-up of smallpox occurred. This can be explained by the combination of two factors: high endemicity in Sind with frequent introductions in to the bordering districts of Punjab and the unsatisfactory coverage of only 64-76% of the population during mass vaccination.

#### Importations

Although it is relatively easy to deal with importations in areas with high herd immunity and where consecutive outbreaks are not numerous, containment operations have not been very effective in the districts of Punjab bordering Sind Province. One of the reasons for this is that villages in these southern districts are surrounded by a large number of smaller settlements, farms, etc., called "bastis" which have difficult approaches and are widely scattered. However, active case detection and containment, as well as the seasonal decline in incidence, has resulted in a reduced number of cases reported. As of September, Punjab Province experienced 38 importations during 1972 - four from NWFP and 34 from Sind Province - which led to the infection of 428 persons, 34% of the total incidence.

### Variolation

The situation in the southern sector has been aggravated by a third, previously unmentioned factor which is probably responsible for sustaining endemicity in Punjab. For the first time in the history of the programme, variolation was uncovered in Rahimyarkhan District in May of this year with the result that 49 persons developed generalized rash. Due to pressure from the authorities, local variolators (dukkars) stopped this practice. Although it was impossible to trace their previous activity, it would appear that endemicity of smallpox has been preconditioned by variolation to some extent.

### Migrants

People without permanent residence represent a large proportion of the population though their numbers are difficult to estimate. Roughly this group can be divided as follows:

- (a) A seasonal flow of "Powindas" from NWFP, Baluchistan and Afghanistan.
- (b) Half-settled "Changars" mainly residing in Lyallpur, Sheikhpura and Gujranwala Districts.
- (c) Permanent slums in big urban centres resulting from peasants looking for jobs.
- (d) Numerous gypsy-like tribes scattered everywhere.

In our view, the first three groups can be controlled providing that the health services' staff pay more attention to the movements of these people. At present, the prospect of controlling the last group is bleak.

### Conclusions

The programme has entered its fourth year. Owing to mass vaccination, the establishment of a sound reporting system and the development of a surveillance mechanism since the summer of 1971, endemicity of smallpox in Punjab Province has declined. The epidemic trend for 1972 shows a remarkable decrease in incidence compared to 1971. To date, there are 30% fewer cases recorded compared to the corresponding period in 1971. We expect further progress in the coming months.

A major breakthrough has been achieved by eliminating the disease in Lahore Municipal area and in Gujranwala District, a leading factor in solving the problem of indigenous smallpox in central Punjab.

The programme has suffered a setback in the southern districts due to poor coverage during the mass vaccination campaign and frequent introductions from neighbouring Sind, in addition to variolation. Efforts in the southern districts must be directed towards establishing a high level of immunity in the population, coupled with an active search for cases and the immediate notification and containment of outbreaks.

The present trend clearly demonstrates that the main goal of the programme in the coming months should be to sustain a very active reporting and surveillance mechanism.

TABLE 1

VACCINATION COVERAGE DURING THE ATTACK PHASE  
PUNJAB PROVINCE 1969-1971

<u>District</u>	<u>Coverage (%)</u>
Lahore	86.43
Sheikhupura	77.18
Gujranwala	85.56
Sialkot	82.49
Gujrat	89.14
Rawalpindi	70.30
Campbellpur	63.18
Jhelum	83.10
Sargodha	77.43
Mianwali	60.93
Jhang	82.06
Lyalpur	71.97
Sahiwal	79.08
Multan	93.02
Muzaffargarh	93.02
D. G. Khan	78.34
Bahawalpur	64.78
Bahawalnagar	68.44
Rahimyarkhan	76.43

TABLE 2

CASES AND DEATHS, PUNJAB PROVINCE  
1961-1971

Year	Cases	Deaths	Case-Fatality Rate
1961	1 102	196	17.8
1962	1 585	305	19.2
1963	1 192	211	17.7
1964	727	132	18.2
1965	598	86	14.4
1966	1 894	261	13.8
1967	4 147	557	13.4
1968	970	222	22.9
1969	2 082	346	16.6
1970	1 502	265	17.6
1971	2 036	285	14.0

TABLE 3

PUNJAB PROVINCE, DETECTED AND REPORTED  
SMALLPOX CASES

Year	Total	Reported	Detected	Ratio Reported/ Detected %
1971	2 036	587	1 449	1:3
1972 (Jan-Sept)	1 271	421	850	1:2

TABLE 4

PUNJAB PROVINCE, DATE OF ONSET OF SMALLPOX  
CASES AND DATE OF INVESTIGATION/NOTIFICATION

JANUARY - SEPTEMBER 1972

District	Days							Weeks			Months										Total
	1	2	3	4	5	6		1	2	3	1	2	3	4	5	6	7	8	9	10	
Lahore	21	8	10	18	21	7		29	50	30	45	51	15	5	4	-	-	4	18	-	336
Sheikhpura	-	-	-	-	-	-		-	1	-	4	5	4	4	2	-	-	-	-	-	20
Gujranwala	3	2	5	5	4	6		17	28	27	48	32	13	1	-	-	-	-	-	-	191
Sialkot	1	2	-	-	-	-		6	4	18	13	13	8	2	-	-	-	-	-	-	67
Gujrat	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rawalpindi	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Campbellpur	2	3	2	2	4	1		6	11	10	9	3	4	-	-	-	-	-	-	-	57
Jhelum	-	-	-	-	-	-		-	2	-	-	-	-	-	-	-	-	-	-	-	2
Sargodha	1	1	2	-	2	1		26	11	6	6	3	-	-	-	-	-	-	-	-	59
Mianwali	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jhang	-	-	-	-	-	-		1	1	-	8	11	4	1	-	-	-	-	-	-	26
Lyallpur	1	2	1	-	1	-		11	24	12	26	4	-	-	-	-	-	-	-	-	82
Sahiwal	-	-	-	-	-	-		2	1	4	-	2	-	-	-	-	-	-	-	-	9
Multan	-	-	-	-	-	-		2	3	-	3	-	-	-	-	-	2	2	-	-	12
Muzaffargarh	1	1	3	2	1	3		6	27	24	26	17	1	-	-	-	-	-	-	-	112
D. G. Khan	-	-	-	-	-	-		-	1	-	8	7	1	-	-	-	-	-	-	-	17
Behawalpur	-	1	-	-	-	-		-	1	7	9	1	3	-	-	-	-	-	-	-	22
Behawalnagar	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rahimyar Khan	1	1	-	2	4	2		11	33	50	61	31	10	8	10	19	10	3	3	-	259
Total	31	21	23	29	37	20		117	198	188	266	180	63	21	16	19	12	9	21	-	1 271

TABLE 5

PUNJAB PROVINCE, DURATION AND SIZE  
OF SMALLPOX OUTBREAKS  
JANUARY - SEPTEMBER 1972

S I Z E	D U R A T I O N						
No. of Cases	1 month	2 months	3 months	4 months	5 months	6 months	7 months
0-1	51	-	-	-	-	-	-
1-5	69	18	-	-	-	-	-
6-10	13	23	6	4	-	1	-
11-20	1	7	3	3	-	-	2
21-50	2	2	2	2	-	-	-
51+	-	1	-	-	-	-	-
Total	136	51	11	9	-	1	2

GRAND TOTAL: 210



FIGURE 1  
PUNJAB PROVINCE, SMALLPOX CASES 1971-72

