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THE PLANNING, ORGANIZATION AND EXECUTION  
OF SMALLPOX ERADICATION CAMPAIGN IN PAKISTAN

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Nature and extent of the problem

East Pakistan is a highly endemic area for smallpox. During the last few decades epidemics had broken out every four to six years and the highest peak of incidence was in the months of March and April. The last epidemic occurred in 1957-58 recording 100,000 attacks and 60,000 deaths. The following statement will show the figures of attacks and deaths for 1950-51 epidemics and from 1957 to 1962.

| Year | Attacks | Deaths |
|------|---------|--------|
| 1951 | 21,273  | 9,445  |
| 1952 | 38,871  | 30,341 |
| 1957 | 24,920  | 18,149 |
| 1958 | 79,060  | 58,891 |
| 1959 | 15,048  | 9,508  |
| 1960 | 1,805   | 1,271  |
| 1961 | 429     | 189    |
| 1962 | 747     | 298    |

According to the available figures the reported number of vaccination performed in 1957-58 showed a coverage of nearly 50% of the total population. In spite of this high coverage a major epidemic occurred in 1958. In each epidemic children under 10 years of age accounted for high attack and death rate.

#### Factors responsible for the epidemic

Although a system of vaccination existed, the following were considered to be the major factors for the epidemics:-

- (a) Inadequate and insufficient supervision
- (b) Inadequate staff
- (c) Communication difficulties and inaccessibility of rural areas
- (d) Use of wet lymph and its doubtful potency due to climatic conditions and slow transportation to rural areas
- (e) Inaccurate birth registration and inadequate primary vaccination
- (f) Vaccination result readings scarcely being carried out
- (g) No proper records of vaccinations being maintained and because of this vaccination and revaccination work was unsystematic, the figure being swelled by vaccinating institutional and easily accessible population
- (h) Unwillingness of a certain section of population to undergo vaccination due to ignorance and superstitious belief.

#### Planning

In order to effectively deal with the problem, it was considered necessary to institute a systematic mass vaccination campaign followed by a regular effective revaccination programme. Eradication of the disease depends on the maintenance of a high level of immunity over a number of years and to achieve this end not only reinforcement of field and administrative staff was necessary but also adequate measures to overcome the other factors listed above were essential. The most important consideration was to replace the wet vaccine of doubtful potency by freeze dried vaccine.

#### Pilot Project

Pakistan following the visit of a WHO Consultant in 1960 undertook a pilot project for eradication of the disease in the two districts of Cawmilla and Faridpur, the two worst affected districts during 1957-58 epidemic, having a population of 4.4 and 3.2 millions respectively. In Cawmilla there were 13,494 attacks and 9,750 deaths and in Faridpur 17,125 attacks and 13,184 deaths. This Pilot Project provided complete coverage of the population of the two districts from January to August in 1961. Freeze dried vaccine was used in this campaign. The results were very encouraging that there was no case of smallpox in these two districts in 1961 and 1962.

### Eradication Programme

Based on the experience gained in the pilot project a comprehensive plan of smallpox eradication at an initial cost of Rs.8.4 million (\$ 1.8 million) was undertaken by the Government. The scheme provides complete protection of the total population of about 50 million to be achieved in two phases during the period from November 1961 to November 1972 followed by a final evaluation and assessment of the eradication programme in 1973.

The important features of the eradication campaign are as follows:-

(a) Production of adequate quantity of freeze-dried vaccine which is to be used in the programme.

(b) Mass vaccination campaign in the first phase, i.e. from December 1961 to November 1963 to provide complete coverage of the population.

(c) Follow-up, the second phase of surveillance and revaccination to be carried out from the end of November 1963 through 1972 and undertaken in three rounds of three years each. Health Circles (Thanas) in Rural Areas and "Municipal Committees" in Urban Areas will form the units of operation. Each Health Circle/Municipal Committee will be divided into three zones of equal density of population. Each zone is to be covered by vaccination once in every three years.

(d) Appointment of a whole-time Officer of the rank of an Assistant Director who is responsible for the programme. He is under the direct supervisory control of the Director of Health Services of the Province. In the 17 districts the Chief Medical Officer of Health or Civil Surgeon is in charge of implementation of the scheme. They are assisted by District Health Officers. At the Sub-Divisional level the Sub-Divisional Medical Officers of Health are responsible for the detailed planning, operation and supervision of the vaccination campaign. Adequate field staff is to be employed. Each union with a population of about 10,000 will have a Health Assistant and each Health Circle (Population 100,000) is to have a Sanitary Inspector and a Health Assistant for supervision. The total personnel involved in this programme is as follows:-

Assistant Director of Health Services  
(In charge of the campaign)

1

Chief Medical Officers of Health/Civil Surgeons

17

|   |        |       |
|---|--------|-------|
| District Health Officers  | 12     |       |
| Sub-Divisional Medical Officers of Health                               | 54     |       |
| Sanitary Inspectors<br>(One per Health Circle or & "Thana")             | 409    |       |
| Health Assistants (One per Union)                                       | 4,049) |       |
| Additional Health Assistants for replacement<br>(One per Health Circle) | 409)   | 4,458 |

(e) Provision of transport facilities to the Supervisory and Field Staff.

(f) Wide publicity through different audio-visual media.

Two copies of instructions for Smallpox Eradication Project will be available at the meeting.

#### Progress

The programme was launched from 15 November 1961 and over 40 million people were covered by the end of September 1963. There was some dislocation of work due to the recent cyclone in the coastal areas and flood in others when some of the staff had to be diverted for urgent relief work. However, it is anticipated that the entire population will be covered by June 1964. On completion of the first phase, the follow-up phase will be undertaken from July 1964.

#### Vaccine production

The smallpox vaccine production laboratory in the Institute of Public Health, Dacca which until 1958 was producing only wet vaccine has switched over completely to freeze dried vaccine. Calf is being used in the production of the lymph. The laboratory is presently producing 40 million doses per year which is quite enough to meet the requirements of the campaign. Samples of the vaccine are regularly tested and some batches were sent to the World Health Organization for testing. The report indicates that the vaccine is up to WHO standard.

#### Smallpox in 1963

There were 3,602 attacks and 2,581 deaths from smallpox during the year up to August, 1963, the peak number of cases being in the months of March, April and May. As we were in the midst of eradication programme this was rather disconcerting. The earlier cases reported were in Dacca, the Provincial Headquarter city at the end of December 1962 and were traced to Khulna. Except for the three districts namely Dacca, Faridpur

and Khulna all other districts of East Pakistan have a common border with India. There is sizeable movement of persons by air between Dacca and Calcutta (India). A severe epidemic was raging in adjoining districts of India, since the latter part of 1962 and it was possible that some infection might be imported from India. In view of the launching of the eradication programme the Government enforced quarantine restriction against travellers coming from India without valid international certification of smallpox. This measure along with others fully brought the disease under control by September 1963.

#### Evaluation and Assessment

A plan of operation for evaluation and assessment of the Smallpox Eradication Programme will shortly be undertaken in collaboration with the World Health Organization with a view to assessing the methods, both technical and administrative, used in the vaccination campaign in Kushtia District and to determine what changes, if any, should be made in the organization and conduct of the surveillance phase of the programme. The plan-up will also help to establish the criteria for an accurate assessment of the vaccination results on the basis of the evaluation of the protection induced in the community. The first assessment will begin in 1964. The second subsequent evaluations will be conducted on a short term basis, one from June 1966 to August 1966 and the other for a year from October 1972 to September 1973. The World Health Organization will provide one Epidemiologist under the programme and necessary equipment and supplies worth \$ 10,000. The WHO Expert has not yet been assigned to Pakistan.

#### Smallpox in West Pakistan

Smallpox is also endemic in West Pakistan and epidemics break out every 5 to 7 years practically for the same reasons as in East Pakistan. The peak period of incidence is in March and April. It declines with the rise in humidity in July and August. Most of the victims are children under 10 years of age. The control programme has been in existence in the province and no eradication programme has been undertaken yet. Glycerinated lymph has been in use except for the last one year when the freeze dried vaccine from Dacca has been utilized. The trend of disease shows a decline in the number of cases and deaths as will be seen from the following statement. This may be due to intensified vaccination work.

| Year | Attacks | Deaths             |
|------|---------|--------------------|
| 1953 | 9,033   | 2,827              |
| 1954 | 4,320   | 1,300              |
| 1957 | 1,631   | 269                |
| 1958 | 3,161   | 687                |
| 1959 | 3,453   | 622                |
| 1960 | 829     | 147                |
| 1961 | 2,357   | 507                |
| 1962 | 2,386   | 583                |
| 1963 | 559     | 145 (up to August) |