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PRESENT STATUS AND FUTURE PLANS FOR THE
SMALLPOX ERADICATION PROGRAMME IN NEPAL

by

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Introduction

Nepal is a landlocked Himalayan Kingdom sandwiched between India and China. With an area of 54 717 square miles and a population of 11.3 million, Nepal extends for 500 miles along the Himalayas. The flat terai districts and adjoining India comprise 17% of the total area and account for 30% of the total population. Two-thirds of the terai population is concentrated in the eastern half where the population density is 700 persons per square mile. The central hill districts have an average population density of 125 persons per square mile. The northern Himalayan districts are sparsely populated with a population density rarely exceeding 25 persons per square mile. The 218 square miles of Kathmandu Valley with 5% of the total population has a population density of over 2 000 persons per square mile.

The movement of population into China from the northern border is greatly restricted, while there is virtually free movement of people to and from India, particularly from the terai districts.

The country is administratively divided into 14 zones, 75 districts and about 4 000 panchayats. The Panchayat, the basic unit, has a population of about 2 500 and is further divided into 9 wards.

Development of the Eradication Programme

A Pilot Control Project was established in 1962 for the Kathmandu Valley. The eradication programme commenced in fiscal year 1967-68 in 15 districts. Every year additional districts were included in the eradication programme and this year (1972-73) all 75 districts were included.

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In the development of the programme, priority was given to the districts in those zones where zonal health offices were established and also to the terai districts. The districts in far-western Nepal were included only in the fiscal year 1971-72. Although it was originally planned to include the remaining 17 hill districts over a period of the following 3 years, the discovery of a major endemic focus in Kailali District in the far-western Nepal in December 1971 and the fact that these 17 districts are comparatively sparsely populated, led to the decision to include all these districts in the programme during the current fiscal year.

Organization

The Smallpox Eradication Programme (SEP) is a special project in the Department of Health Services. There is a Senior Supervisor in the zones. Wherever the Zonal Health Offices have been established, the Senior Supervisor is attached to the Zonal Health Office. Vehicles have been provided to Senior Supervisors for field supervision but these are useful only in the terai districts and in the valleys.

Each district has one district supervisor, one assistant supervisor and a varying number of senior vaccinators depending on the size of the population in the district. Prior to July 1971, when a district was included in the eradication programme, temporary vaccinators were utilized for a period of 3 months and thereafter senior vaccinators carried out routine vaccinations throughout the year. Each senior vaccinator was assigned a certain number of panchayats and he maintained a household register for the families in the panchayat. However, experience showed that household registers were cumbersome and were not maintained properly by the vaccinators and hence could not be utilised. Further, it was found that people accepted vaccinations only during the winter months and consequently the vaccination output during the rest of the year was very poor.

Hence, the organizational pattern in the districts was changed in July 1971. The vaccination programme was limited to only four winter months. The number of permanent (senior) vaccinators was reduced and temporary vaccinators were utilized in 38 districts (8 new districts and 30 old districts including all terai districts). One temporary vaccinator was recruited locally from each panchayat for a period of one month. The temporary vaccinators visited all houses for vaccination and also carried out an active search for cases. The senior vaccinators supervised the temporary vaccinators. Although this programme in each district could have been completed in one month, in view of the difficulty involved in training and in order to ensure adequate supervision, only one quarter of the district was taken up each month.

In the remaining 20 hill districts, senior vaccinators were utilized for the vaccination programme during four winter months. They also carried out an active search for cases. The household registers were scrapped and simple recording forms were introduced.

During the remaining eight months of the year, the senior vaccinators were utilized only for active search and reporting of suspect cases. All panchayats in the district are visited by senior vaccinators once a month in the terai districts and once every two months in the hill districts for active search for cases.

Four containment teams were recruited in July 1970, but due to certain financial and administrative problems they did not function effectively and soon became defunct due to resignations, etc. During the last two years, the field investigation of outbreaks and containment action have been carried out by district SEP staff under the guidance of SEP HQ staff and the Zonal Supervisor. In September 1972, four surveillance teams were again formed after solving the financial/administrative problems. Development of the reporting system is discussed in a separate paper.

Morbidity Trends

Due to the scarcity of basic health services in Nepal and due to the fact that smallpox

cases hardly ever visit health institutions, the reports of smallpox cases are invariably received only from those districts where smallpox eradication offices function. Thus the number of cases reported in the different years has relevance only to those districts under the SEP (Table 2). Data prior to 1963 are not available.

Since 1971, surveillance activities have been stressed and all reported outbreaks have been investigated fully. There has been more complete reporting of cases since 1971 from the districts under SEP. Since 1968, there have been no smallpox cases in Kathmandu Valley. In 1971, the outbreaks mainly occurred in the eastern terai districts adjoining Bihar State, India. The initial sources of the outbreaks were suspected to be from the border districts of Bihar. Basically, the terai districts of Nepal and the border districts of Bihar and Uttar Pradesh states of India comprise one epidemiological entity.

In 1972 (till 30 September), a total of 373 cases have been reported. These cases occurred in Seti and Bheri zones of western Nepal. Included are 98 cases in Kailali District (Seti Zone) which occurred in 1971 but were discovered during epidemiological investigations in 1972 and hence were reported in 1972. The SEP commenced in Kailali in December 1971 and major endemic foci were detected there. Thus among 275 cases which actually occurred in 1972, the Kailali District focus accounted for 198 cases in addition to the 98 old cases. The spread of smallpox from the focus in Kailali District to neighbouring Bardia District accounted for 42 cases and the neighbouring Doti District accounted for 10 cases. There were 17 more cases in Bheri Zone (western Nepal). The remaining 8 cases were reported in September 1972 from a panchayat in Kailali District near the Indian border. The source of this outbreak was suspected to be an Indian border village in Kheri District, Uttar Pradesh.

During 1972 as well as in previous years, reports of smallpox cases are not received in the months of July and August (Fig. 1). This is mainly due to the monsoon season when swollen rivers and the muddy tracks in the terai districts and landslides in the hill districts make the movement of people, including senior vaccinators (who go for active search of cases), very difficult and sometimes impossible. In 1972, the problem of smallpox has been only in two zones of western Nepal, mainly in the terai districts. The eastern terai districts (which were mainly affected in 1971) have not been affected so far.

Vaccinations

Table 3 shows the number of vaccinations done since 1962. The change in strategy in regard to the use of temporary vaccinators has been described above. During 1971-72, in the eight new districts the mass vaccination programme has achieved a total coverage of 76.4% of the population (Table 4). Vaccination of the remainder will be carried out from December 1972. In the 30 old districts where temporary vaccinators were used, there was a primary vaccination coverage of 9.6% and a total vaccination coverage of 70.8% of the population compared to 5.7% and 37.2% respectively in the 19 old districts (excluding Kaski) where the temporary vaccinators were not utilized. During 1970-71, the vaccination programme was carried out throughout the year in the 41 old districts (excluding 9 new districts) without utilizing temporary vaccinators and there was a primary vaccination coverage of 4.5% and a total vaccination coverage of 22.7% of the population.

Thus the change in the strategy in limiting the vaccination programme to four winter months and in utilizing temporary vaccinators has produced better results in terms of higher primary and total vaccination coverage.

Future plans

All 75 districts are included in the SEP during this fiscal year. Temporary vaccinators will be utilized in all 75 districts during the four winter months of the vaccination programme. Stress is on primary vaccination. Temporary vaccinators will also carry out a search for cases during their house-to-house vaccination. This will help to reveal any undetected foci particularly in the remaining 17 hill districts. Previous experience, however, indicates an extremely low probability of finding endemic foci in these districts.

All SEP personnel in the districts will be mainly involved in active search and reporting of cases. Cooperation is also being sought from malaria house visitors, health institutions and panchayat leaders. Four surveillance teams have been recruited in September 1972. Apart from their function in outbreak areas, the surveillance teams will carry out an active search for cases in the vulnerable terai districts. The reporting system has been greatly strengthened since July 1972.

Pilot projects dealing with the integration of health services are in operation in two districts. Preliminary reports indicate that active search and reporting of cases are strengthened in the pilot project areas.

Smallpox transmission is expected to be interrupted in all districts except 19 terai districts within the next 12 months. The problem of smallpox in the terai districts of Nepal is inseparably linked with the problem of smallpox transmission in the border districts of Bihar and Uttar Pradesh States of India. With the strengthening of the surveillance mechanism (including active search and reporting of cases) in the districts on both sides of the border and with inter-border coordination of SEP officials and prompt cross notification of cases, it should be possible to interrupt smallpox transmission in the terai districts also within the next twelve months.

TABLE 1

NUMBER OF DISTRICTS INCLUDED IN THE SEP

Fiscal year	Number of New Districts	Cumulative Total
1967-68	15	15
1968-69	14	29
1969-70	12	41
1970-71	9	50
1971-72	8	58
1972-73	17	75

TABLE 2

NUMBER OF SMALLPOX CASES REPORTED EACH YEAR SINCE 1963

Year	Number of Districts in SEP	Number of Districts Reporting Cases	Number of Cases Reported
1963	3	3	1 105
1964	3	3	135
1965	3	3	70
1966	3	NA	164
1967	3	NA	110
1968	15	8	249
1969	29	7	163
1970	41	1	76
1971	50	6	215
1972 (Till Sept)	58	6	373*

(*includes 98 cases which occurred in 1971 but were discovered in 1972)

TABLE 3
NUMBER OF VACCINATIONS DONE EACH YEAR

Fiscal year	Number of Districts in SEP	Number of Vaccinations
1962-67	3*	643 699
1967-68	15	1 246 033
1968-69	29	2 195 942
1969-70	41	2 136 468
1970-71	50	2 823 098
1971-72	58	6 162 478

(* Pilot Control Project in Kathmandu Valley)

TABLE 4
VACCINATION COVERAGE DURING THE YEAR 1971-72

Number of Districts	Population	Primary Vaccination	Total Vaccination
8 new*	891 662	213 639 (23.9)	681 900 (76.4)
30 old*	5 842 309	566 695 (9.6)	4 143 924 (70.8)
19 old**	3 013 406	172 156 (5.7)	1 122 547 (37.2)

Figures in paranthesis are percentages of total population

(* with temporary vaccinations; ** without temporary vaccinators)

Fig.1. INCIDENCE OF SMALLPOX IN NEPAL

