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SURVEILLANCE IN SMALLPOX ERADICATION

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CONQUEST OF SMALLPOX IN MAHARASHTRA STATE  
CONTAINMENT AND FOLLOW-UP MEASURES  
FAILURES AND ACHIEVEMENTS

by

Dr R. V. Aphale<sup>1</sup>



Maharashtra State is still regarded as endemic for smallpox. In the year 1967, 27 61 cases and 5 113 deaths were reported. Five years later, in 1972, 230 cases and 44 deaths have been reported to date. Our vigorous and concerted efforts to effectively control smallpox have certainly yielded some tangible results. At the same time, it has to be conceded that much remains to be done to control a few pockets of infection in some urban areas of the State where foci persist. However, plans are under way to combat these and to bring them under effective control. Smallpox incidence in the State has been appreciably reduced mainly on account of systematic epidemiological surveillance and stringent containment measures.

This paper discusses the epidemiological findings of one of the recent outbreaks in Thana City of Thana District which was later transmitted to the rural areas in Poona District.

POONA DISTRICT

Epidemiological Surveillance

Late in the afternoon of 18 February 1972, the District Health Officer, Poona, communicated by phone the details of a suspected case of smallpox detected by a vaccinator in the field in the village Vadu, under the Primary Health Centre, Kendur, in Sirur Block of Poona District. We rushed to the village and confirmed that it was a case of smallpox, the patient being a 6 year old unvaccinated boy. His twin brother showed no marks of primary vaccination, though the mother emphatically stated that both had been vaccinated previously. This family stays in their farm house, on the outskirts of the village Vadu; four other houses are located in the immediate neighbourhood.

<sup>1</sup> Maharashtra State

### History of Infection

On enquiry it was elicited that this woman had gone with her two children to her father's place at Pabal. Her other two sisters had also gone to Pabal with their children.

To gather further information, we rushed to Pabal village, where the father of these three sisters was staying in a farm house, away from the village Pabal. Our pursuit was fruitful as one more case of smallpox was detected in this very house - a child belonging to one of the three sisters staying with their father.

### Area of transmission

It was learnt on enquiry that the daughter-in-law of this old man had come to Pabal from Thana on 25 January to attend a local Mela festival and that she was pregnant. The three sisters joined her subsequently at Pabal for the festival on 27 January.

### Attack Proper

The daughter-in-law of this old man had fever on 27 January and was treated by a local doctor the same day. She developed rash on 31 January, aborted on 5 February and died two days later. During this entire period, the other sisters continued to stay at Pabal. After a time, two of them left for their village and the third remained behind with the father. The village from where this third daughter had come was immediately visited and we succeeded in detecting one more case of smallpox, thus making a total of four cases including one death.

Additional information was collected from the old man to assess the source and extent of infection. It was revealed that:

- 1) His son - the husband of the deceased woman - had come to perform the last religious ceremonies after the death of his wife. He furnished the exact postal address of the deceased woman in Thana, which led us to surmise that the infection may probably have been lingering in that particular locality.
- 2) During the Mela, 26 persons from different villages had visited the affected family. The parents of the deceased woman had also visited her during her illness. A list of their names and addresses was prepared for further enquiry.

### Institution of Measures

By the time the information was precisely compiled, 3 vaccinators and one Sanitary Inspector were detailed for a vaccination programme, which was carefully chalked out. To speed up work, 9 more vaccinators were summoned for duty.

Next morning, the District Health Officer, Thana, was telephoned to check up at his end. In the afternoon he rang back confirming the existence of infection in that locality and stated that 8 cases had so far been detected and a search for more cases was in progress. The DGHS, New Delhi, was informed telegraphically on 19 February.

### Containment Measures

I. An expeditious vaccination drive was launched in the 3 affected villages - Vadu, Pabal and Pachwad (Kendur) - where the cases were located. As soon as the additional nine vaccinators reported for duty, vaccination was begun in 5 additional threatened villages.

II. All 26 persons who had visited the affected family were contacted to ascertain if any additional cases had occurred. Intensive vaccination work was also undertaken in these villages.

III. The village of the parents of the deceased woman was also visited.

IV. Regular daily surveillance was continued in these villages for one month. Simultaneously, the vaccination work was also going on.

No fresh cases were reported from Pabal and Pachwad (Kendur) villages. However, 3 additional cases occurred in Vadu in March followed by one more case on 2 April.

The containment measures were supervised by the Epidemic Medical Officer, Medical Officer i/c, Primary Health Centre, Kendur and District Superintendent of Vaccination.

#### Follow-up

In this episode, there were 8 cases and 5 deaths. A tremendous back-log of primary vaccination was noticed in village Vadu (population 2 254). Stray episodes of refusal of vaccination were also noticed in this village and the progress of work was a little slow. Hence, containment measures were maintained even during April. In the rest of the villages, the containment measures were completed in March.

In the three affected villages (population 14 836), 328 primary vaccinations and 8 703 revaccinations were performed from 18 February to 31 March. Similarly, in the five threatened villages (population 8 804) 227 primary vaccinations and 4 839 revaccinations were performed. During April, 11 primary and 440 revaccinations were performed in village Vadu.

#### Conclusion

It was felt that the lingering focus of infection in the village Vadu for about 2 months was directly attributable to lack of aggressive containment measures.

### THANA DISTRICT

#### Epidemiological Surveillance

As discussed above, the District Health Officer, Thana, confirmed on 19 February the existence of a focus in Thana City (population 170 167) and continued house-to-house search for cases in that locality. The affected locality is a vast hutment area. Within the first three days, 19 old and new cases were detected of 24 cases which had already occurred by that date. From 19 February to 7 March, (date of last attack) 11 more cases occurred, bringing the total to 35 cases and 3 deaths.

#### Containment Measures

On the very first day, on detecting the focus, the District Health Officer, Thana, made available 12 vaccinators to institute expeditious control measures and to locate additional cases. Within the next three days, 25 additional vaccinators and seven Sanitary Inspectors were also detailed for duty and an intense vaccination drive was undertaken in the affected locality.

Our immediate epidemiological scrutiny showed that the infection had been lingering in that locality for about two and a half months, the first case dating back to

4 December 1971. By the time the outbreak came to be noticed, it had already built up to epidemic proportions. Therefore, it was of paramount importance to effectively curb the spread of infection by immunizing all susceptibles within as short a time as possible.

The containment operation was planned in stages. In the first stage, in the first week, 30 of 37 vaccinators were concentrated in the affected area and other adjoining hutment areas to cover the target population of 30 000 of a total population of 170 167 in Thana City. They concentrated on house-to-house search for fresh cases and intensive vaccination work. The remaining seven vaccinators were saddled with the responsibility of a rapid case-finding programme in other wards of Thana City.

In the second stage, 15 vaccinators were detailed for one more week in the same area to undertake case-finding work and perform vaccinations. All the rest of the vaccinators undertook vaccination work and case-finding work in different municipal wards.

During a period of 17 days from 19 February to 7 March (date of last attack), 1 538 primary vaccinations and 18 885 revaccinations were performed in the target population of 30 000.

In the third stage, eight vaccinators were kept in the affected area and the remainder worked in separate municipal wards. This period lasted up to 31 March. During this period, the total primary vaccinations rose to 1 734, with 54 565 revaccinations. No fresh cases were reported during this period. All the industrial establishments in and around Thana were also visited. On 31 March, our concentrated containment measures came to a close. In the last stage, in April 1972, mopping up work continued. All additional vaccinators who were pooled for intensive work were withdrawn in two batches, and at the end of April only eight vaccinators were working. In the month of April, 696 primary vaccinations and 12 682 revaccinations were performed.

From 19 February to 30 April, 2 430 primary vaccinations and 67 247 revaccinations were performed in all.

#### Follow-up

Because of the inordinate delay in detecting the focus of infection, it was assumed that the infection might have spread to the adjoining areas. It was also a little difficult to determine the contacts of the patients within this period. Our epidemiological investigations led us to adjoining slums and different villages in rural areas where cases of smallpox were detected.

- 1) As soon as the focus of infection was detected, the Executive Health Officer, Bombay Municipal Corporation, was alerted. The District Health Officer, Kolaba-Pen, was informed of the onset of the epidemic by telephone from Thana. The Municipal authorities of Kalyan, Ehiwandi, etc., were personally contacted and apprised of the grave situation.
- 2) As soon as the source of importation of infection was suspected, the Programme Officer, U.P. was told.
- 3) Absence of surveillance activity delayed the detection of the focus. However, a massive vaccination drive accomplished by pooling a large number of vaccinators, succeeded in interrupting the transmission of infection.
- 4) Some of the smallpox cases were shifted by the Municipal Council authorities to Kasturba I.D. Hospital, Bombay, which ought not to have been done.

The containment operation was supervised by the District Health Officer, Thana, Municipal Health Officer, Thana, and District Superintendent of Vaccination, Thana.

#### CONCLUDING REMARKS

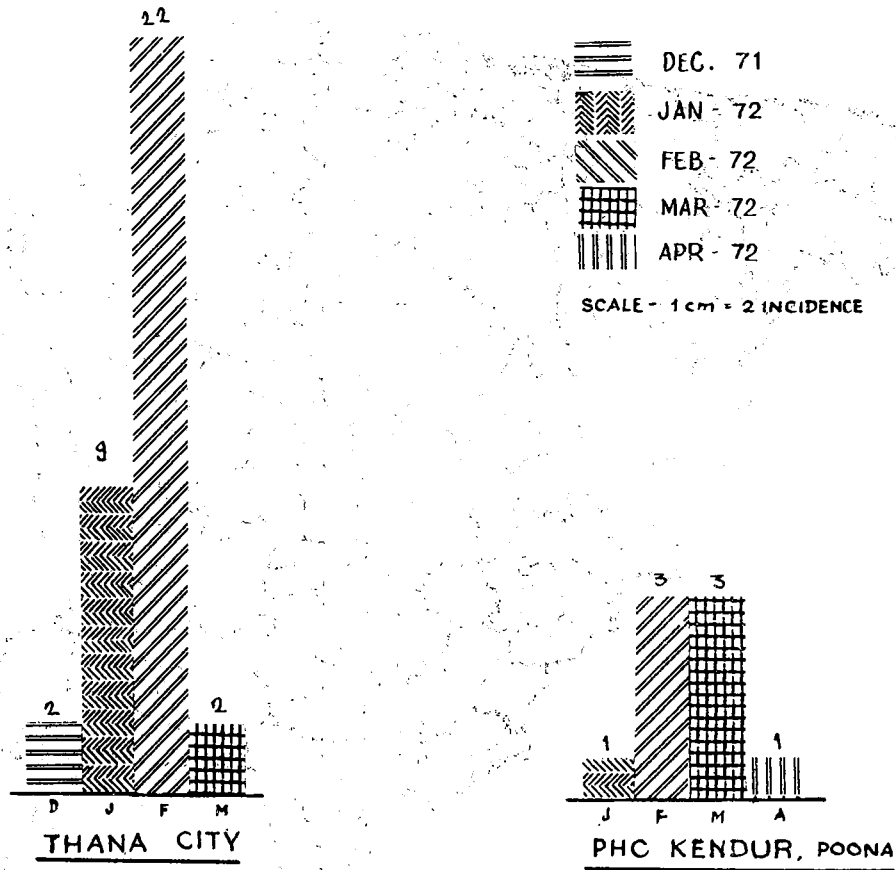
It was in fact only one episode affecting two districts simultaneously and at a distance of about 130 miles. Active surveillance and prompt reporting effectively helped in arresting the further spread of the epidemic in rural areas. However, the slow progress of vaccination work often results in a lingering focus, as was observed in the paper under study. A massive vaccination drive in the affected area in an urban town, could arrest the infection immediately even though it was noticed a little late.

The discussion on this episode is restricted to the focal outbreak of smallpox in Thana City only, and not beyond that.

THANA

Age-group	Male	Female	Total	Vacci- nated	Non- vacci- nated	Total	Deaths
Years							
0-1	-	3	3	-	3	3	-
1-4	10	4	14	-	14	14	2
5-14	6	10	16	-	16	16	1
15-29	-	1	1	-	1	1	-
30 & above	-	1	1	-	1	1	-
TOTAL	16	19	35	-	35	35	3
POONA							
0-1	-	1	1	-	1	1	1
1-4	1	1	2	-	2	2	1
5-14	2	-	2	1	1	2	1
15-29	-	2	2	2	-	2	2
30	1	-	1	1	-	1	-
TOTAL	4	4	8	4	4	8	5

## SMALLPOX INCIDENCE (MONTHWISE)



FIRST CASE — 4-12-71

ACTION STARTED - 19-2-72

LAST CASE — 7-3-72

FIRST CASE — 31-1-72

ACTION STARTED-18-2-72

LAST CASE — 6-4-72

