WORLD HEALTH ORGANIZATION
ORGANISATION MONDIALE DE LA SANTÉ

SE/WP/72.5

ENGLISH ONLY

INDEXED

INTER-COUNTRY SEMINAR ON
SURVEILLANCE IN SMALLPOX ERADICATION
New Delhi, 30 October - 2 November 1972

TRACING OF THE SOURCE OF INFECTION

by

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Introduction

The tracing of the source of infection of the first smallpox case in an outbreak is of vital importance so that previously unrecognised or unreported foci of infection can be detected and contained. To illustrate, I relate to you a true success story in which I was involved in tracing the source of infection in an outbreak in village TIBBA, in District Hoshiarpur last year.

District Hoshiarpur has 11 blocks, of which Saroa block is the most backward. Its northern part is hilly, covered with forest and with no roads. In this difficult area is situated the village TIBBA in one corner of the block which was the scene of a smallpox outbreak in November-December 1971 (Fig. 1). Himachal Pradesh is visible across the river Sutlej and the towns of Ananpur, Kiratpur and Bilaspur are also visible from here.

The First Case

SHRI NAND LAL lived with his family in house No. S-62 in village Tibba. On 8 November he returned home from a place unknown to the local villagers with a severe rash of smallpox and was confined to his home. He never believed in smallpox prevention by vaccination and so was never vaccinated. Believing in a magic cure for smallpox, he sent for Bawa Bishen Dass, a priest of a temple situated in the forest one mile away from the village (Fig. 2). The Bawa visited daily for 4 days and performed some rites but Shri Nand Lal died of smallpox on 11 November. This Bawa had lived in the temple as a priest for 40 years and had always preached against smallpox vaccination. He himself got infected from Shri Nand Lal and became the fourth case in the outbreak. The simple ignorant hill people believed him and discouraged the health staff from doing vaccinations in the village.

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Secondary Cases

Infection spread from Shri Nand Lal to 9 more persons in the village (Table I). In all 10 cases (one death) occurred, involving 8 houses (7 houses and a temple), in the village of Tibba. The infected houses are clustered along a lane in one part of the village; N.M.E.P. numbers identify the houses. House No. S-62 was the focus of the spread of infection to nearby houses. The residents of the lane are closely related and mix intimately in daily life.

There were no cases under one year of age; one case in the age group 1 - 4 years; two in the age group 5 - 14 years; 6 cases in the 15 - 44 year age group; and only one in the age group 45 and above. Six were male and four female.

The outbreak lasted 25 days, starting from 8 November and ending on 2 December. Notification was greatly delayed by the vaccinator and the health inspector, against whom strict action was taken by D.H.S. Punjab. The Medical Officer I/C P.H.C. Saroa notified the cases on 3 December after an enquiry in the village on 2 December. Of 10 cases, 9 were found by routine notification and one was found by investigation of the other cases by the D.C.M.O.H.

The vaccination status of the villagers was unsatisfactory. Three cases were without primary vaccination scars and only 2 cases had been revaccinated some 8 to 10 years before.

Containment Activity

Village Tibba has a population of 841 living in 156 houses. The villagers are either labourers or serve in the army and so are mostly mobile during the year. By 5 December the staff had done 36 primary vaccinations and 651 revaccinations. The rest of the persons were out of the village. A team of vaccinators was stationed in the village for one-and-a-half months to keep a watch on new-comers who had gone out of the village and thus the entire population was covered by this team.

The initial containment vaccination proceeded slowly after discovery of the first case on 10 November by the vaccinator. He tried to cover the whole village single-handed with gaps of many days without informing the Health Inspector or M.O.I/C P.H.C. Saroa or any officer of the office of Chief Medical Officer Hoshiarpur. Had he notified the cases earlier, many cases would have been prevented. The Health Inspector also was found negligent in his duty as he waited for the monthly meeting of M.O.I/C P.H.C. Saroa on 1 December to inform him of the outbreak and did not take it as a great emergency and did not organise systematic vaccination. Necessary disciplinary action was taken by D.H.S. Punjab against them. Thus the negligence of the health staff delayed notification and speedy 100% coverage by vaccination of the village population.

Assistant Unit Officer (smallpox) rushed to the village when he received the notification wire from M.O.I/C P.H.C. Saroa on 3 December. He made the village his headquarters for a month and ensured organisation of containment measures in the village and in surrounding villages in a 5 mile belt along the borders of Himachal Pradesh. Three teams of Health Inspectors and vaccinators later covered the whole block with mass vaccination. He could not trace the source of infection and, similarly, Medical Officer I/C P.H.C. Saroa could not trace the source of infection by 11 December.

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Tracing of the Source of Infection

Dr Ishar Singh, D.C.M.O.H. Hoshiarpur, was on National Emergency Duty at that time, organising National Emergency Transit Camps in the western part of the district. He completed his duty on 10 December and on 11 December immediately proceeded to the village to assess the efficacy of containment measures and to trace the source of the infection. He conducted a thorough enquiry over a 4 day period and succeeded in tracing the source of infection. As if by telepathy, on 14 December Dr MAHENDRA SINGH, D.A.D.G., communicated to the C.M.O. Hoshiarpur stating - "it will be most interesting if the D.C.M.O.H. Hoshiarpur himself investigates this outbreak to pinpoint the source of infection and also to confirm the earlier observations." Dr Ishar Singh had already traced the source of infection by that time and sent his enquiry report to Dr Mahendra Singh on 21 December.

When I visited village Tibba on 11 December I started enquiring of the people, beginning with the family members of Shri Nand Lal, the first smallpox case. His wife would not disclose anything as she was too grieved to reply to any queries. The neighbours were also ignorant of movements of Shri Nand Lal. Some said that he had gone to a village 40 miles away but the name of the village was unknown. The Chowkidar was also quiet on the subject. Then I went to the residence of Sarpanch Hamira Ram, who was resting after lunch. At first, he would not tell anything about the previous movements of the first case. Later, he offered a cup of tea which I accepted. As we were taking tea, he became friendly and came out with the information I required. He confessed that he did not notify the case for fear that higher officers might visit with consequent harassment and wasting of time, or that they might take some action against him for letting smallpox spread in the village. Moreover, he feared Bawa Bishen Dass would get angry as he does not want health people to work in the village and interfere with his hold over the people. I assured him that the matter would be kept in confidence and no blame would come to him.

Sarpanch Hamira Ram disclosed that on 11 December one Shri JOGINDER SINGH, Jat, of village BHANGLAN, Tehsil Anandpur, District Rupor, a truck driver, visited village Tibba and met him in the forenoon and was still present in the village. That was my first day of enquiry. He was the person who transported in his truck, Shri NAND LAL, to village Samarkot, Tehsil Rohru, District Mahasu, Himachal Pradesh on Diwali Day, as Shri Nand Lal desired to work as a labourer to fill the potatoes in the bags (Fig. 3). Later, this same person brought him back to village Tibba on 8 November in a very serious condition as he was very badly infected with smallpox. The driver visits the village at times to recruit labourers for this trade. I sent for the driver and requested him to state the truth about the movements of Shri Nand Lal before he returned and died. He gave his statement in writing, in his own language, which was attested by the Sarpanch and reads: "I work in village Samarkot, Post Office Samarkot, Tehsil Rohru, District Mahasu. Shri Nand developed smallpox in Samarkot where smallpox is sufficiently spread. There doctors refused to give him injections etc. and forced me to transport Shri Nand back to the Punjab. I brought him by truck via Bilaspur, Kiratpur, straight to village Tibba and left here on 8 November. He died on 11 November. He came to me nearabout Diwali days. There in Samarkot, the house owner also forced me to remove the case from the house; then I was forced to arrange for his transport to his village." On getting this information, I informed telegraphically D.H.S. Simla, D.H.S. Punjab and Dr Mahendra Singh, D.A.D.G., New Delhi.

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Dr Mahendra Singh, D.A.D.G., wrote in comment: "Regarding the source of infection, I must congratulate you that you have very nicely traced it to village Samarkot, Tehsil Rohru, District Mahasu, Himachal Pradesh. There were 8 cases with 2 deaths in Samarkot. The Himachal authorities have not been able to locate the source of infection for the Samarkot outbreak very precisely. It is rather distressing to note that Shri Nand Lal developed smallpox in Samarkot which was already known to the local health authorities as a smallpox affected area. It seems that this patient was also seen by local doctors in the affected areas who refused to treat him and forced Shri Joginder Singh, the driver, to transport Shri Nand Lal back to village Tibba. The local authorities in the affected area in Himachal Pradesh would not have forced the driver to transport him to village Tibba because thereby the infection must have disseminated to other areas."

Recommendations for Prompt Tracing of the Smallpox Infection

The objective of this inter-country Seminar on Surveillance in Smallpox Eradication is to interrupt transmission of smallpox in the critical year of 1973 and, in view of that, I would like to make the following recommendations for prompt tracing of the smallpox infection (Fig. 4):

1) WHO/DGHS Level

My request is that after this Seminar is over, quick action should be taken by all concerned on a war footing. It is hoped that the current excellent guidance and support will continue on emergency footing in order to eradicate smallpox from India.

2) State Health Directorate Level

Intense Smallpox Education Programme should be started immediately, in each village of the country and men and materials should be provided in the field as needed without delay.

3) District Health Authorities Level

Create Emergency Vaccination Squad at each District Headquarter, comprised of a Health Inspector and some vaccinators. In case there is an outbreak of smallpox in any part of the district, this squad will be sent immediately for quick containment measures in addition to the P.H.C. staff already working there. At other times, this squad will help the medical officers of the P.H.C.'s to accelerate the coverage of difficult areas thus completing vaccination in whole of the block every 3 years.

Create FEARLESSNESS in reporting smallpox cases and deaths among health staff and local village leaders all over India. Prompt notification should be appreciated. The vaccinator or Health Inspector must inform his Medical Officer and Chief Medical Officer of the District as soon as possible on coming across a definite or suspected case of smallpox. He should cancel all other engagements until containment measures are over. This quick notification will help quick tracing of the source of infection and so previously unrecognised or unreported foci of infection can be detected and contained. Also, let us organise the training of medical officers and their health staff at P.H.C. level, demonstrating to them the techniques of investigation of the cases and of tracing the source of infection.

Primary Health Centre Level

Medical Officer I/C P.H.C. must at once notify a smallpox case after his enquiry. Without waiting for any instructions from higher authorities, he should at once organise containment measures on a war footing under his supervision. Also he should conduct a scar survey of the block in December yearly and take necessary action to raise the herd immunity.

Medical Officer I/C P.H.C. should be allowed to attend a monthly meeting with the Medical Officer I/C P.H.C. of the adjacent block of the same district and the block of the neighbouring State to discuss matters of mutual interest in order to interrupt transmission of smallpox. Cross notification by M.O.I/C P.H.C. very promptly will help trace out the source of infection in many cases.

Village Level

Intensive Smallpox Education should be started immediately in each village by giving film shows, distributing pamphlets in the local language, by holding discussions and seminars, and by individual education by all types of health staff of the P.H.C. on a personal level. People are used to old beliefs based on religion, and priests, like Bawa Bishen Dass of village Tibba, have been exploiting the ignorant villagers for their own ends, thus preventing vaccination of the masses. Let us free the villagers from them so that they will voluntarily be vaccinated regularly and so that they will readily come forward to give information to any enquiry officer about the movements of a smallpox case and thereby the source of infection.

The Sarpanch is the key man in a village. In addition to creating friendship with Showkidars, Priests, Teachers and other department workers, the Sarpanch and the panchayat members of a village should be specially attended to and Medical Officer I/C P.H.C. should win his confidence. Let the Sarpanch be the first man to notify a smallpox case to the Medical Officer or Chief Medical Officer of a district. His cooperation is most essential for containment measures and for tracing the source of infection.

TABLE 1

INVESTIGATION OF CASES AND DEATHS

STATE - PUNJAB
DISTRICT - HOSHIARPUR
VILLAGE - TIBBA
OUTBREAK NO. - 1
POPULATION - 841
HOUSES - 156

SURVEILLANCE OFFICERS

1. Dr Baldev Raj
   MO I/C PHC, Saroa
2. Dr Ishar Singh
   DCMOH, Hoshiarpur

DATES OF INVESTIGATION

2 Dec. 1971

11, 12, 13, 14 Dec. 1971

Case No.	Name	Village and house No.	Age	Sex	Date of onset of rash	Vaccination before exposure
1.	Nand Lal (s/o Sunder)	Tibba (S-62)	30	M	?3.11.71	P/V - nil R/V - nil
2.	Sada Ram (s/o Puran)	Tibba (S-58)	27	M	18.11.71	P/V - yes R/V - 10 years ago
3.	Ram Lok	Tibba (S-115)	30	M	18.11.71	P/V - yes R/V - 8 years ago
4.	Bawa Bishen Dass (priest of temple)	Jungle one mile from Tibba	60	M	18.11.71	P/V - nil R/V - nil
5.	Charno (d/o Sunder sister of Nand Lal)	Tibba (S-62)	20	F	18.11.71	P/V - yes R/V - nil
6.	Jogindro (d/o Mansa)	Tibba (S-68)	20	F	21.11.71	P/V - nil R/V - nil
7.	Gurdev (s/o Lachman)	Tibba (S-56-B)	10	M	30.11.71	P/V - yes R/V - nil
8.	Pawan Kumari (d/o Gurdial)	Tibba (S-56)	4	F	1.12.71	P/V - yes R/V - nil
9.	Toshi (d/o Ram Kishen)	Tibba (S-56-C)	7	F	2.12.71	P/V - yes R/V - nil
10.	Joginder (s/o Puran)	Tibba (S-115)	22	M	2.12.71	P/V - yes R/V - nil

FIGURE 1

DISTRICT HOSHIARPUR - BLOCK SAROA

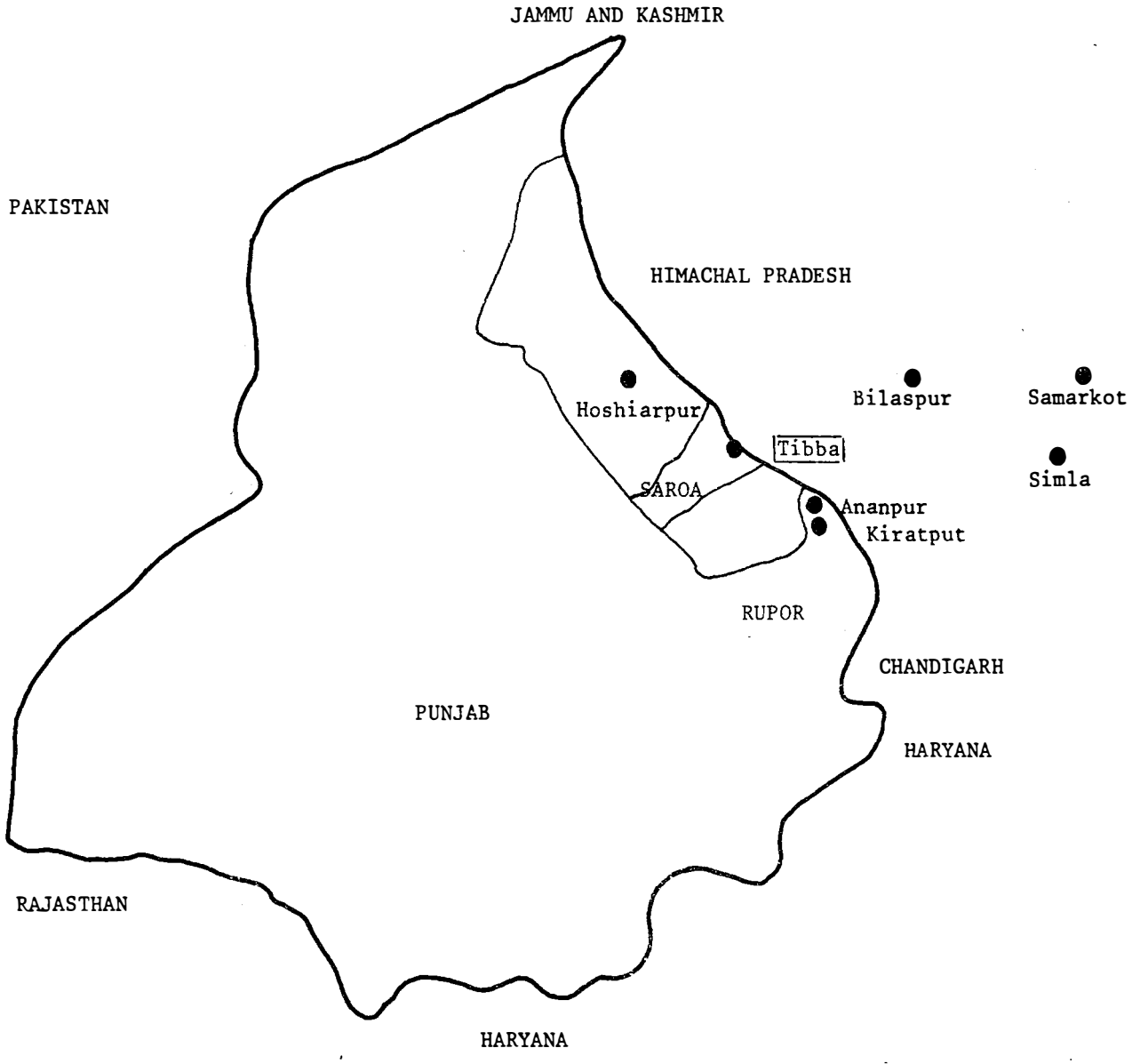


FIGURE 2

VILLAGE TIBBA

Population - 841
Houses - 156

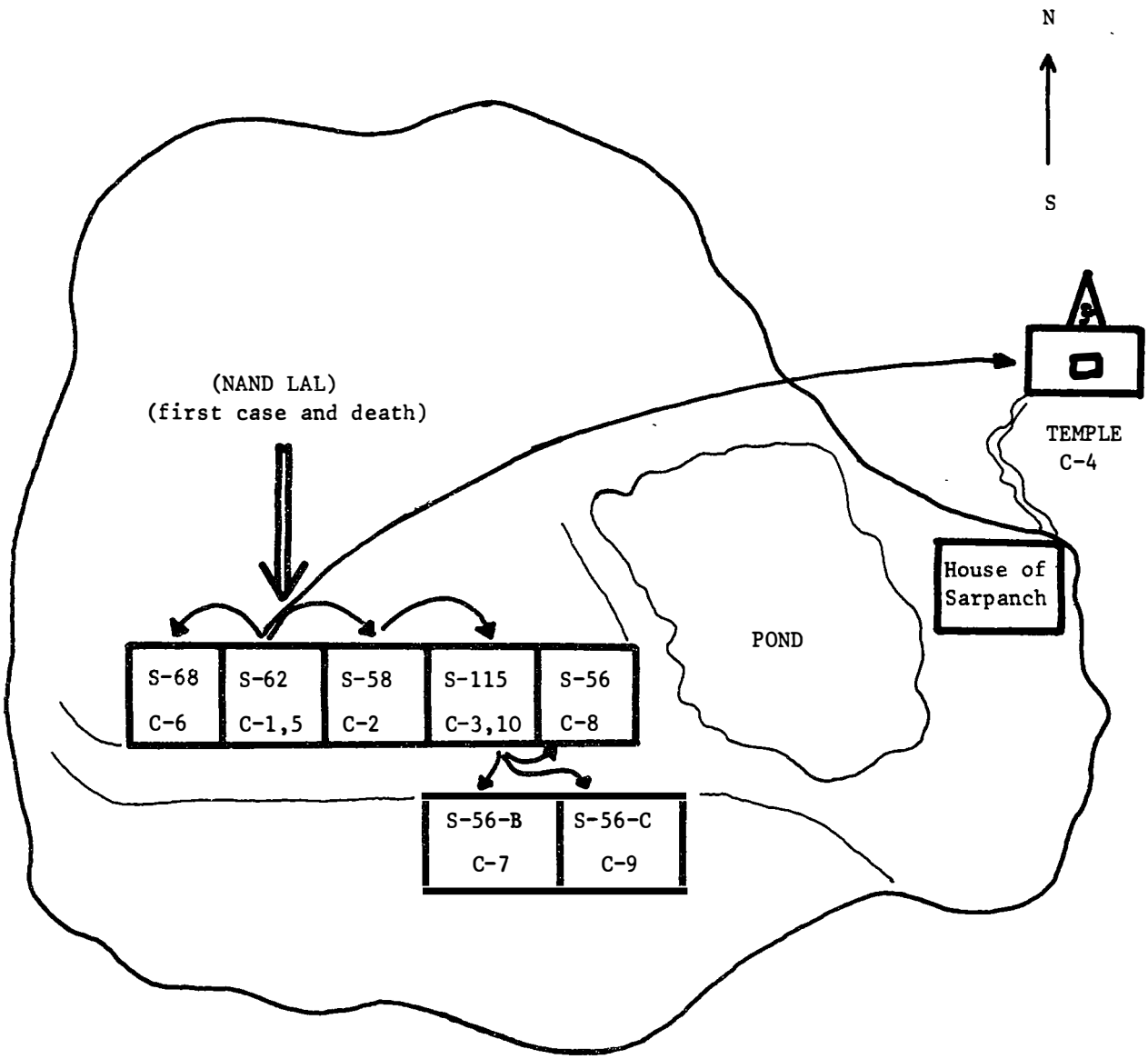
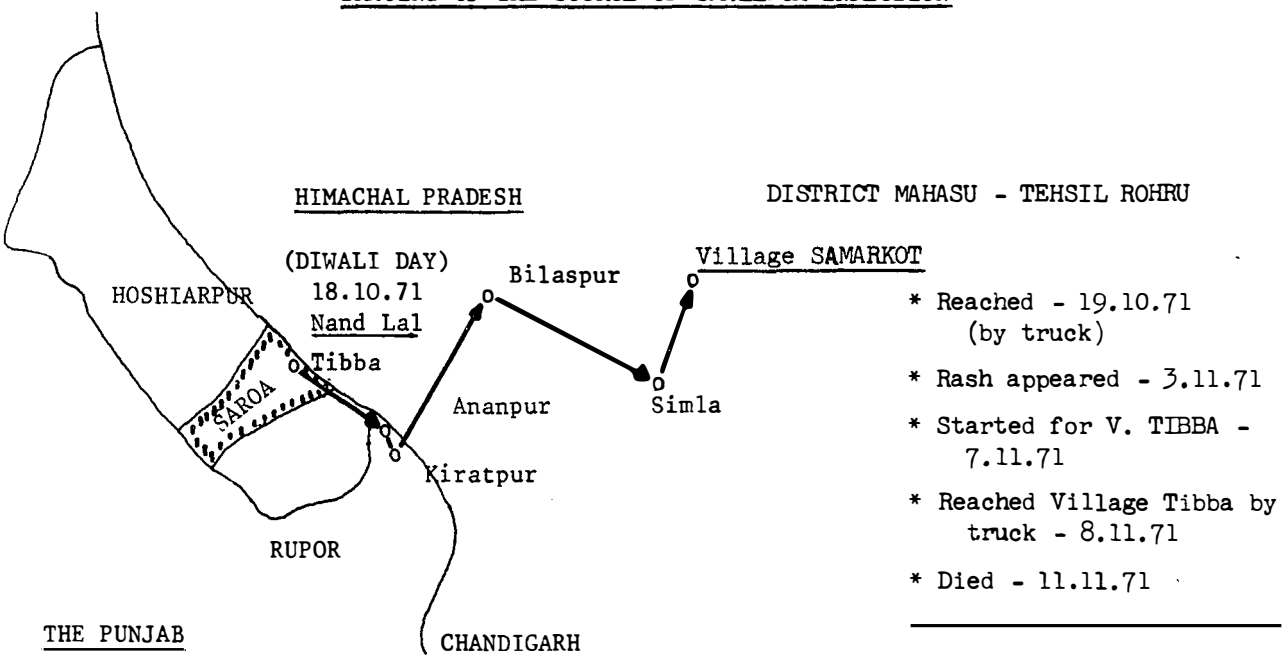


FIGURE 3

TRACING OF THE SOURCE OF SMALLPOX INFECTION

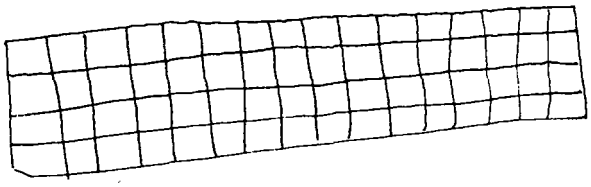


* TRANSPORTED BY - SHRI JOGINDER SINGH, DRIVER
* TRACED FROM - SARPANCH HAMIRA RAM (V. TIBBA)
* TRACED BY - DR ISHAR SINGH, D.C.M.O.H. HOSHIARPUR
* TREATED BY - BAWA BISHEN DASS (Temple priest V. Tibba) (by magic - that failed)

FIGURE 4

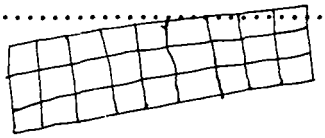
RECOMMENDATIONS FOR PROMPT TRACING OF THE SMALLPOX INFECTION

DIRECTORATE GENERAL OF HEALTH SERVICES, INDIA (New Delhi).



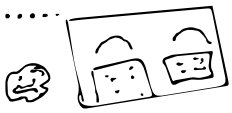
WORLD HEALTH HOUSE S.E.A.R.O. New Delhi

1. W.H.O. Inter-country Seminar, be followed by quick action by all concerned.
2. Current guidance & support to eradicate smallpox from India be continued on emergency footing.



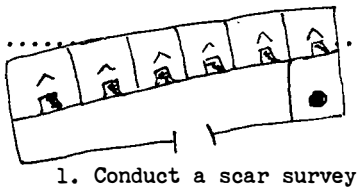
DIRECTOR HEALTH & F.P. PUNJAB (CHANDIGARH).

1. Intense Smallpox Education Programme be started immediately in each village of the Punjab.
2. MEN & MATERIALS be provided in the State as needed.



DISTRICT (C.M.O. OFFICE)
Chief Medical Officer.
Deputy Chief Medical Officer A.U.O. (smallpox)

1. Create Emergency Vaccination Squad.
2. Create Fearlessness in Reporting in staff.

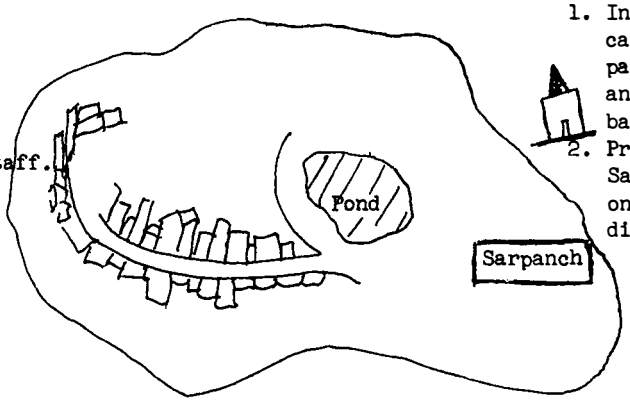


PRIMARY HEALTH CENTRE -
M.O.I/C PHC.
Health Inspectors.
Vaccinators.
Other staff of PHC.

1. Conduct a scar survey of block in December yearly and take necessary action. Organise Vaccination and containment and notify.
2. Attend monthly meeting with M.O.I/C PHC of the nearby block and nearby State to discuss matters of mutual interest.

VILLAGE SCENE

Sarpanch.
Chowkidar.
Priest.
Teachers.
Other Dept. Staff.



1. Intensive Smallpox Eradication - by film, pamphlets, discussions, and by staff on individual basis.
2. Promote notification by Sarpanch and others at once to M.O./CMO of the district.