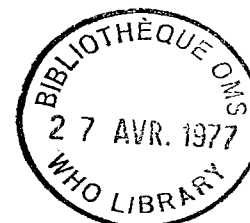SURVEILLANCE AT WEEKLY MARKETS IN THE
SMALLPOX ERADICATION PROGRAMME IN INDIA

by

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INTRODUCTION

The strategy of the intensified campaign for smallpox eradication in India, launched in 1973, was based on active surveillance to identify smallpox outbreaks, and on the epidemiological investigation and rapid containment of any outbreaks detected.[1]

Week long village-to-village searches by the workers of all health programmes were carried out at intervals of three to six weeks in four endemic states from September 1973, and at longer intervals of every two to three months in other states of India. In the period between these periodic searches secondary surveillance methods were widely introduced. One of these was active surveillance for smallpox at places of periodic public congregation such as weekly markets, melas, festivals, etc.

Weekly markets, as points of trade and social transaction are known throughout the country. However, they are a more popular and permanent feature in the central and eastern parts of India, particularly in the states of Madhya Pradesh, Bihar, West Bengal, Assam, Meghalaya and the eastern parts of Uttar Pradesh.

Before September 1973, surveillance at markets had been sporadically carried out in some states. In 1972-73, efforts were made in Rajasthan to determine the status of weekly markets in representing the population of the rural areas.

During the latter months of 1974, a team detailed solely to weekly market searches, was assigned for Chaibasa area, Bihar, to develop the search technique and to determine its effectiveness in reporting smallpox and in disseminating knowledge of the reward. Further research on weekly market surveillance was also conducted in the states of Assam and Meghalaya, during the period of November 1975 to March 1976, in order to identify the catchment areas of the markets, to improve surveillance techniques in the market and to determine their effectiveness and utilization of resources in comparison with the well-developed technique of house-to-house surveillance.[2,3,4] Since smallpox incidence had apparently reached zero by that time, detection of other diseases with fever and rash appearance was used as a criteria to assess surveillance efficiency. Three blocks of different districts were selected for these studies representing different geographical and demographical areas. Plain areas were represented by Tamalpur and Laharighat blocks of Assam with many inhabited river islands being present in the latter. Songsak block of Meghalaya State is a forested hill area in the eastern part of the state.

The population consisted of different tribes and religions and its density ranged from 26 to 389 persons per square kilometre.

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Experience accumulated by these studies and the practical implementation of surveillance during the past two years allow us to outline some important points about weekly market searches.

PLANNING

Planning includes the selection of markets according to their location and catchment areas plus the composition of the surveillance teams.

District level administration is the point where planning starts. The district census book and the Revenue Department help to identify to what degree the weekly markets play a part in the habits of the local population and which are the major markets involved in the congregations of local people. Usually there are 50-200 markets in each district. Therefore, definitive planning actually starts at the block level with a number of markets varying from four to fifteen. The geographical location of the markets in a block and the number of persons attending form the initial criteria for their selection for surveillance.

The number of persons attending the market was usually estimated by questioning market managers or traders at the site.[2,3] Dr R. S. Sharma[4] used some additional sources of information, such as the area of the market, the amount of tax collected by the Government, and the sum total of crops such as paddy or jute, for sale.

According to initial trials, a searcher was able to interrogate 50-80 market visitors within an hour. Continuing these calculations, we estimate that 300-500 market visitors may be questioned by a searcher during a working day. One senior supervisor is able to organize the work of several teams at a single market.

METHOD OF SEARCH

Half an hour before transactions start, the search team begins distribution of publicity material. Posters and leaflets showing the appearance of a smallpox patient and others announcing the reward, are fixed at entry points and at other places such as tea and snack shops where they attract attention. By the time visitors start to arrive, two workers are located at each major entry point. One of the workers shows the recognition card to the people arriving, describes the picture and announces the reward. As soon as a group of 10-15 people collect around him, he turns from making these announcements to individual questioning. The main questions concern knowledge of the disease, its presence in the village, name and address of any patient, and address of the visitor. However, all researchers have laid stress upon the fact that the question concerning the informant's name and address is the last query, since this question can cause unwillingness to hold further discussion. Meanwhile, the second worker records all the information. This prevents the crowd from dispersing as can happen if only one worker is questioning and recording the data. Later, as market transactions reach their peak, the teams move to the market area itself and continue questioning among the groups resting at tea shops or relaxing in the shade.

Verification of reports received starts at the market itself. The searchers pose leading questions to the residents of the villages reported to be affected earlier in the day. This gives additional details and helps in confirming or disproving the previous report.

In the evening, or the next day, the teams compile their results and submit them to the PHC medical officer. The catchment areas of the markets are identified from the list of villages recorded by the searchers. This forms the basis for the revision of markets initially selected for searching. After considering the catchment areas of the markets in Tamalpur block of Assam, for example, the number of markets selected for search was reduced from seven to three.[3]

OBSERVATIONS

In the three studies conducted, a better village coverage was achieved in the plain areas in Assam where 98% and 95% of the villages of the block were represented by market visitors (Table 1). A lower coverage in Songsak block (73%) was obviously due to the omission of two markets visited by less than 1000 people. Nineteen to twenty-two per cent. of the block population was found to visit the markets every week, representing 35% to 66% of the families residing in the block villages. On average 1% to 2.7% of the members of a family visited a market each week.

All three studies were carried out simultaneously with the active house-to-house search in the blocks surrounding those under study. This allowed comparison of the effectiveness of the two different surveillance techniques.

The number of reports received through the markets usually represented the prevalence of the disease found in the surrounding blocks by the house-to-house search.

The same correlation was found in the study in Chaibasa district of Bihar, where during nine days of searching in 13 markets, 43 out of 45 reported smallpox outbreaks occurring in the previous 11 weeks were reported at the markets.[6]

Another study in 1976 was aimed at detecting the occurrence of smallpox in three blocks of Meghalaya during previous years.[5] The blocks had been affected during 1973-75. A week long search at seven major markets of the three blocks was carried out by 4-11 searchers. All 13 villages known to be affected in 1975 were reported by the market visitors. Fifty-three per cent. of the smallpox outbreaks recorded at the District Health Office in 1974 and 31% of those in 1973 were also brought to the attention of the market searchers.

Urban markets were also utilized as a means of assessment of house-to-house search in Calcutta in 1975.[7] While carrying out the assessment at a house, the assessor questioned family members about whether they had seen a search worker, or a recognition card, whether they know about the Rs. 1000/- reward and where they should report any smallpox cases. Visitors to markets located in the same area as the "at-house" assessment, were asked the same four questions. The results of the market assessment were uniformly one-third to one-half lower than those obtained by the at-house assessment, however, the assessment at the market was able to detect the same areas of poor surveillance, as reported by the at-house assessors.

Apart from these studies, weekly market searches were introduced on a wide scale in a number of states. In August 1974 continuous market searching was launched in Madhya Pradesh with monthly reporting from primary health centres through to the state level. The same system was established in West Bengal, Assam and Meghalaya and, in 1976, in Bihar and Orissa. In other states, implementation and reporting varied from district to district, depending upon the market system and upon the initiative of the District Health Officer. In spite of this late implementation of the system at a time when smallpox had practically disappeared from the country, some smallpox outbreaks were detected by the market search: three in West Bengal and one, the last in that state, in Uttar Pradesh.[8,9]

After achieving zero smallpox status, much stress was placed on reporting of other diseases with rash for two main purposes:

to assure that no smallpox case similar to chickenpox or any other disease was left undiagnosed and unreported;

to have an indication of surveillance efficiency.

Weekly market searches were continued as a part of this surveillance. Training sessions for epidemiologists and state surveillance team medical officers in the market search technique were carried out at the end of 1975 and the beginning of 1976. These sessions were followed by field briefing for PHC medical officers and their supervisory staff. Table 2 shows an increasing productivity of the market search in 1976. Less satisfactory results were

reported from the four north-western states of India. In the southern states, surveillance at the markets was found by the National Smallpox Assessment Commission to be unproductive and was not recommended for future use.[10]

Although it was tried in a number of states, widespread surveillance at weekly markets did not match the encouraging results obtained during the special studies quoted in this paper. The reasons for this disparity were analysed and found as follows:

(1) The recognition card used for surveillance, presents a picture of a smallpox patient and not a case of chickenpox or measles, which were the diseases being sought.

(2) During these special studies, one search worker was assigned for every 500 market visitors, while as a routine only one and certainly not more than two searchers were being used to carry out searches at the markets of any size. Supervision was usually confined to giving instructions at the PHC office.

(3) The reward of Rs. 1000/- for reporting smallpox was not expanded to other diseases and the population, being aware that no available measures exist to prevent chickenpox or measles, were not unduly anxious to report these diseases.

CONCLUSION

Searches at weekly markets proved to be an efficient method of surveillance for smallpox although not as effective as the house-to-house method.

Reasonably good results were obtained when the search was planned in advance and closely supervised by a medical officer or a special search team.

The market search involves one-fourth to one-third of the manpower required for the house-to-house active search in the same area.

The market search technique may be recommended for a rapid but not precise evaluation of disease prevalence in a limited area, presence of disease in the past, or for assessment of the efficacy of other surveillance techniques and publicity.

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TABLE 1. CATCHMENT AREA OF MAJOR MARKETS
IN THREE DIFFERENT BLOCKS OF ASSAM AND MEGHALAYA STATES

Block (District)	Density of population (per km^2)	No. of villages in selected block	No. of markets searched	No. of villages represented by persons			Total
				1-9	10-29	30 and above	
Tamalpur (Kamrup)	71	204	8	13	55	131	199 (98%)
Laharighat (Nowgong)	382	226	5	NA	NA	NA	215 (95%)
Songsak (Garo Hills)	26	244	7	58	121	NA	179 (73%)

TABLE 2. CONTRIBUTION OF THE WEEKLY MARKETS
TO SURVEILLANCE FOR RASH WITH FEVER DISEASES, 1976

Month	Percentage of rash with fever cases reported at the weekly markets to total cases reported during month			
	Assam	Bihar	Madhya Pradesh	Orissa
January	5.0	19.3	12.4	2.4
February	10.1	23.6	20.8	3.9
March	3.3	8.9	14.8	1.5
April	9.9	17.7	4.9	10.8
May	11.4	29.4	15.9	18.4
June	11.4	34.8	30.0	21.3
July	23.4	37.8	41.5	23.4
August	16.1	NA	18.4	16.4

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