WORLD HEALTH ORGANIZATION

SE/WP/72.14

INTER-COUNTRY SEMINAR ON
SURVEILLANCE IN SMALLPOX ERADICATION

INDEXED

New Delhi, 30 October - 2 November 1972

CONTROL OF SMALLPOX IN DELHI MUNICIPAL CORPORATION

by

Dr P. H. Jeswani[1]

1. Introduction

Union Territory of Delhi has three administrative units:

i) Delhi Municipal Corporation (population 37.6 lacs.)

ii) New Delhi Municipal Committee (population 2.96 lacs.)

iii) Delhi Cantonment Board (population 0.85 lacs.)

Delhi Municipal Corporation looks after the implementation of NSEP in the entire Union Territory of Delhi excluding NDMC, the Cantonment areas and railway boundaries. However, a close liaison is maintained with the concerned authorities. The aim is to interrupt the transmission of smallpox as early as possible.

For administrative convenience the Municipal Corporation areas have been divided in 8 zones. This includes the rural zone with a population of 5 95 700 (see Figure 1).

Delhi, being the capital city, attracts large numbers of visitors from different parts of the country as well as from abroad. In addition, expansion and construction work in the capital also attracts large numbers of labour population from the bordering highly endemic states of U.P. (*7 617 cases), Rajasthan (*1 624 cases) and Haryana (*1 501 cases). People from all walks of life visit the capital during the various National and International fairs and Exhibitions and occasions like Independence Day and Republic Day Celebrations. The labourers stay in temporary hutments (at times difficult to locate) in overcrowded conditions, which favour the transmission of smallpox. Because of this particular feature of the capital city, keen surveillance and constant alert must be continuously maintained to detect any infection of smallpox so that prompt epidemiological investigations, tracing of source of infection, cross notification, effective containment and follow-up

*Figures of incidence are provisional and up to August 1972.

---

[1] Medical Officer in Charge, National Smallpox Eradication Scheme, Delhi

activities could be pursued.

Further, there is an I.D. Hospital, which receives cases of smallpox from the neighbouring districts.

There are 138 vaccinators, i.e. one vaccinator per 25 000 population. Each vaccinator has been provided with a recognition card and a map of his assigned area. He is required to vaccinate the population from door to door, and to vaccinate the newborns in maternity and nursing homes in his area. His principal function of course is to be on the 'hunt' to detect any case of 'fever with rash' and report immediately by telephone to his supervisors.

There are 55 birth and death-cum-vaccination centres, where registration of new borns and vaccinations are carried out. These centres also serve as the 'reporting centres' for any case of 'fever with rash'.

Up to the present, we have been able to appoint 32 vaccination inspectors (out of 37 sanctioned posts) to supervise the work of vaccinators. The supervisor/vaccinators ratio comes to 1:4. Their chief responsibilities include inspection of primary vaccinations, active case detection, guidance and supervision of vaccinators under their charge. They also impart health education to the public in respect of early reporting of smallpox. In case of outbreaks, necessary epidemiological investigations, outbreak containment activities and transmission of information to the head office by telephone is also done by them.

Besides this, there is one 'flying squad' comprising one vaccination inspector and 4 vaccinators equipped with one vehicle to work as a 'fire fighting unit' to supplement the efforts of the local staff viz. active detection of smallpox cases, containment and follow up activities. When no case of smallpox is reported, the 'flying squad' is on the move to "HUNT" for even suspected cases of smallpox, particularly in the "problem areas". In the process, they also vaccinate the unprotected children thus discovered. Revaccination is given to those who are due for it. All the above mentioned activities are personally supervised by the Medical Officer in Charge, National Smallpox Eradication Programme.

2. Smallpox Eradication Programme

The National Smallpox Eradication Programme was launched in the Union Territory of Delhi on 1 April 1962 with the "object to vaccinate the entire population of the territory." At that time, little emphasis was given to the surveillance component of the programme.

2.1 Vaccination Coverage

From Table 1, which indicates the year-wise vaccination performance from 1962 to 1972 (up to August), it will be observed that every year more than 4% of the population, which, incidentally, is the annual estimated birth rate, are receiving primary vaccinations. In 1972 also, it is expected that about 5% of the total population will be covered for primary vaccinations. The revaccinations figures also range from 16% to 49% of the total population. Multiple puncture technique of vaccination employing bifurcated needles and potent thermostable freeze-dried smallpox vaccine is being utilized. This has ensured almost 100% success rate in primary vaccinations. The inspection rate, however, oscillates between 60% to 70%.

2.2 Immunity status of the population

Table II indicates the results of the scar survey carried out in the representative permanent resident population in the eight zones of the Corporation during 1970 and 1972. From this table, it will be observed that both in 1970 and 1972, there had been more than 90% vaccination coverage in 0-14 years age group in all the eight zones.

The comparative study of the figures of percentages of unprotected in the age group 0-14 years in 1970 and 1972 does not indicate any significant difference in the majority of the zones. However, vaccination status of the vulnerable age group viz. 0-14 years has improved significantly in New Delhi South Zone.

2.3 Trend of smallpox incidence

The following table indicates the year-wise reported cases and deaths of smallpox, 1967 to 1972 (up to September). The proportion of the 'imported' to the 'local' cases has also been indicated.

Year	Cases		Proportion of imported to local cases	Total
	Imported	Local		
1967	276	176	1 to 0.6	452
1968	22	48	1 to 2	70
1969	19	9	1 to 0.5	28
1970	40	56	1 to 1.4	96
1971	104	213	1 to 2	317
1972 (up to Sept.)	47	70	1 to 1.5	*117

*4 cases confirmed 'negative' by laboratory tests have been deleted.

2.4 Observations on the incidence of smallpox in 1972

The rise in the trend of incidence from 1969 onwards is obvious.

In 1972 (up to September), 117 cases have been reported as against 305 cases reported in the corresponding period in 1971.

It is interesting to observe that out of 47 imported cases in 1972, as many as 17 (36%) were direct admissions into I.D. Hospital, Delhi, from U.P. (16 cases) and Rajasthan (1 case). In 1972, all the eight zones were smallpox infected (Figure 1).

The majority of cases, however, were reported from the following zones:-

Shahdara Zone (7 outbreaks, 25 cases)

Rural Zone (11 outbreaks, 19 cases)

Karol Bagh Zone (7 outbreaks, 17 cases)

Sadar Pahar Ganj Zone (5 outbreaks, 14 cases)

City Zone (6 outbreaks, 10 cases)

New Delhi South Zone (7 outbreaks, 9 cases)

In the remaining two zones, the position is as follows:-

Civil Line Zone (3 outbreaks, 4 cases) and

West Zone (2 outbreaks, 2 cases).

In all, 53 areas in 8 zones were affected, resulting in 100 cases. In 30 instances, the source of infection was traced to the neighbouring states viz. 23 from U.P. (Bullundshahar 6, Hamirpur 5, Morabadbad 3, Badaun 2, Aligarh 2, Azamgarh 2, one each from Gorakhpur, Pratap Garh and Etah); 4 from Haryana (3 from Gurgaon and 1 from Hissar), 2 from Rajasthan (2 from Kotah and 1 from Jaipur) and one from Himachal Pradesh (Dist. Kangra). In all instances, cross notification was done with the concerned health authorities, but 5 replies - 2 from Rajasthan (regarding Kotah and Jaipur), one each from Hissar (Haryana), Kangra (H.P.) and Azam Garh (U.P.) - were received. In all instances, the source of infection as traced by us was not confirmed.

In 33 outbreaks (out of 53, 62%) the delay in notification was under one week; in 11 outbreaks, it was between 1 and 2 weeks. In 6 outbreaks, the delay in notification was between 2 and 3 weeks. In only two outbreaks, the delay was between 3 and 4 weeks. In the remaining one outbreak the delay in notification was 40 days.

In most of the outbreaks i.e. 43 out of 53, the first information regarding the occurrence of smallpox was received from I.D. Hospital, Delhi. Nine outbreaks were detected by the area vaccinator himself. In one instance, the information was conveyed by the Chief Medical Officer, Gurgaon, Haryana. From this, it will be observed that the concept of active surveillance utilizing recognition cards is not well developed. The contribution of the field staff of NMEP, who are expected to visit every house once in a fortnight is nil. Likewise, no information about the occurrence of smallpox was received from the public and their leaders. The sweepers of the Corporation who visit most of the houses every day did not report.

The epidemiological investigations, tracing of source of infection, containment and follow-up were not carried out as was expected. In as many as 30 outbreaks, the source of infection was labelled as "LOCAL", which really means nothing. Out of these 30 outbreaks, as many as 20 were 'single case outbreaks', which again emphasizes the need for proper epidemiological investigations, detection of additional cases and tracing of EXACT source of infection.

The recently introduced weekly smallpox epidemic reporting system has been established. All the 32 Vaccination Inspectors have been instructed to submit weekly smallpox epidemic reports of their areas regularly, and in time. Even 'NIL' reports are being insisted upon. The Medical Superintendent of the I.D. Hospital, Delhi, is contacted by telephone daily regarding any admission of a smallpox case.

ACKNOWLEDGEMENT

I am deeply grateful to Lt. Col. O. N. Tyagi, Municipal Health Officer, Delhi for permitting me to participate in the Seminar. His keen interest in the programme and day to day guidance is gratefully acknowledged.

FIGURE 1
Map of Delhi Municipal Corporation
Indicating the various zones & zone-wise number of smallpox cases reported in 1972

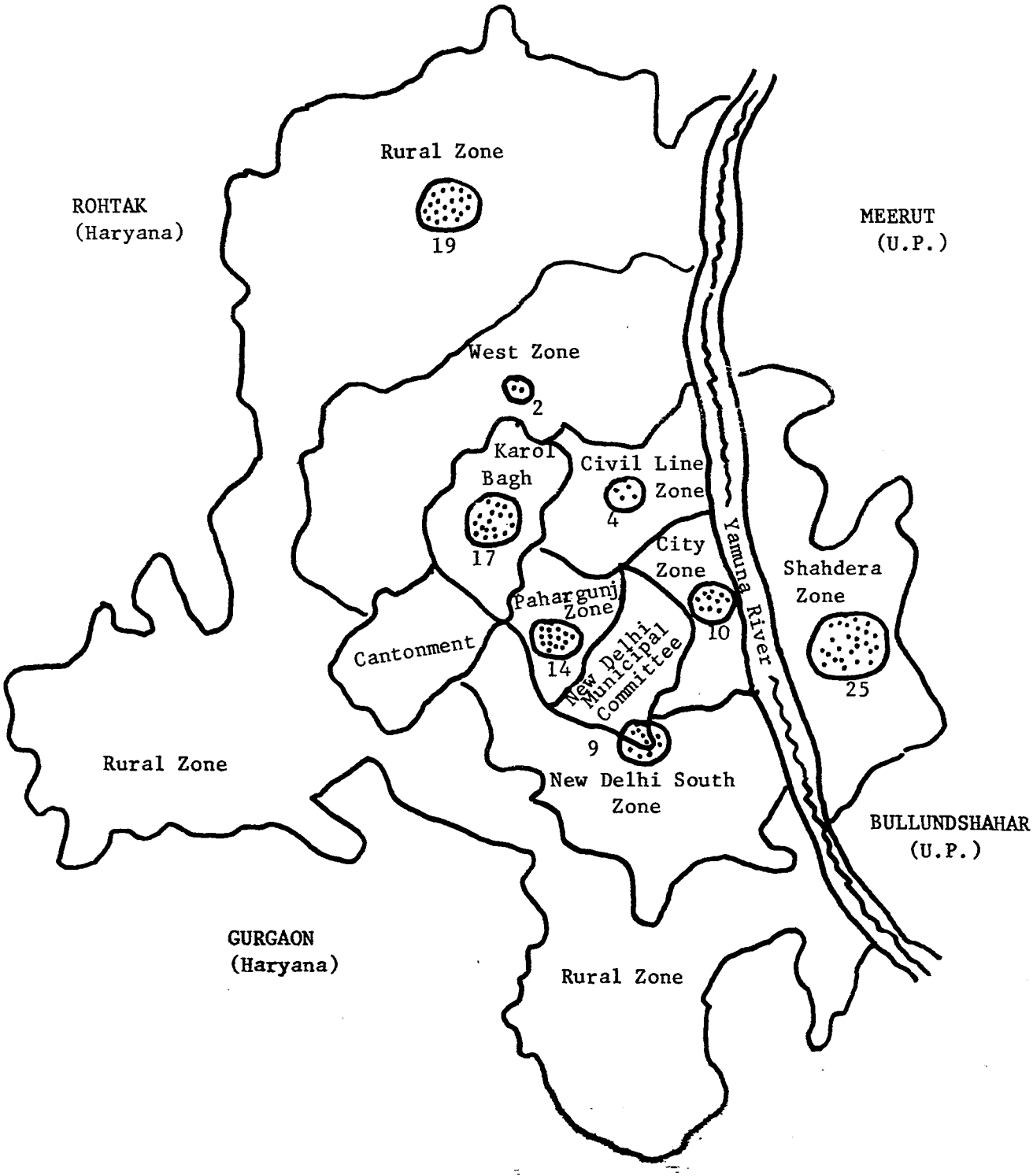

TABLE I

Indicating the year-wise vaccination coverage from 1962 to 1972 (up to August)

Year	Population	Primary vaccination	Percentage	Revaccination	Percentage
1962	24 69 149	1 19 800	4.9	7 94 980	32.0
1963	25 50 298	1 14 956	4.5	11 34 407	44.0
1964	26 31 429	1 34 229	5.1	8 72 257	33.0
1965	27 12 569	1 36 680	5.0	6 87 547	25.3
1966	27 93 708	1 61 266	5.8	6 47 362	23.2
1967	28 74 849	1 40 830	4.9	14 07 150	48.9
1968	29 55 989	1 39 965	4.7	7 32 060	24.8
1969	30 37 129	1 50 100	4.9	9 67 997	31.8
1970	31 18 269	1 34 053	4.3	5 25 032	16.8
1971	36 94 451	1 73 751	4.7	6 30 249	17.0
1972 (Aug.)	37 96 580	1 40 092	3.8	9 17 582	24.1
TOTAL		15 45 722		93 16 623	

TABLE II

Indicating the vaccination status by zone and by age group of the permanent resident population

S. no.	Name of zone	Population	Percentage of the population unprotected in the various age groups							
			0-1 yr.		1-4 yr.		5-14 yr.		0-14 yr.	
			1970	1972	1970	1972	1970	1972	1970	1972
1	Karol Bagh Zone	4 89 000	21.0	13.4	1.0	0.9	nil	0.12	2.0	2.5
2	Rural Zone	5 95 700	11.6	11.6	2.2	3.0	nil	0.3	3.2	2.6
3	New Delhi South Zone	5 57 000	19.0	8.7	1.1	1.3	0.3	0.3	8.0	1.7
4	West Zone	4 47 500	12.0	12.0	2.0	0.9	0.7	0.4	2.4	1.7
5	City Zone	4 90 000	15.2	11.5	4.4	1.3	0.7	nil	4.0	2.2
6	Shahdara Zone	4 71 000	12.0	8.0	0.8	1.5	2.4	0.27	1.2	1.8
7	Sadar Pahar Ganj Zone	5 38 800	10.1	16.3	1.2	3.5	2.3	1.6	3.0	4.0
8	Civil Line Zone	3 07 500	6.0	14.0	0.2	2.6	nil	1.2	0.67	3.2