

Measles surveys*

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Abstract

The authors present background data indicating that there is a close correlation between serological findings and children's measles histories obtained from parents. They conclude that interrogative surveys can yield reliable epidemiological information even though the sample of the survey population checked serologically may be small.

It has been stated in previous communications (Mehta et al., 1972; Shah et al., 1972) that subclinical

cal check on 8% of the survey population has recently been reported (Shah et al., 1972). It should be noted that certain prerequisites set forth in that communication must be satisfied if such surveys are to be reliable. If these are neglected, the information obtained is likely to be erroneous and misleading.

For the information of interested workers, the background data on which the study of Shah and associates was planned, with additional material obtained subsequently, is presented here in tabular form.

Table 1. Location, number, and age distribution of children serologically assessed for measles in India

Serial no. of study	Place	Year	Category (see text)	No. of children	Age in years			
					½-1	1-3	3-5	>5
1	Bombay	1967	A	200 ^a	50	50	50	50
2	Bombay	1969	B	56 ^b	17	27	12	—
3	Aurangabad	1969	A	79 ^b	31	42	6	—
4	Aurangabad	1970	A	61 ^c	11	32	18	—
5	Indore	1969	A	348 ^b	140	176	20	12
6	Indore	1971	B	106	15	66	25	—
7	Poona	1970	B	40	—	1	11	28
total				890	264	394	142	90

^a Data of Mehta et al. (1972).

^b Prevaccination serum samples collected during a measles vaccine trial conducted by the Indian Council of Medical Research.

^c Data of Shah et al. (1972).

infections of measles do not occur in the nonimmune child to an appreciable extent. This view was based on the close correlation found, in tests of over 600 sera obtained from different sources, between the history given by the parents and the serological findings in the child. It was therefore suggested that information on the epidemiology of the disease might be obtained by interrogative surveys, and a test survey of this nature including a serologi-

It will be seen from Tables 1-3 that the evidence is convincing in spite of certain obvious defects. Many of the sera were collected for a vaccine trial, so that there was a selection for children without a history of measles. Further, the necessary pre-conditions and planning are known to have been adhered to only in the studies in category A—studies 1, 3, 4, and 5—whereas in the remainder, in category B, we have no knowledge of the conditions. It may be a coincidence that these are the groups where the greatest discrepancy between histories and serological findings was noted.

It should be emphasized that to avoid any possi-

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Table 2. Correlation of serological results and history taken from parents

Serial no. of study	No. of children serologically assessed	No. of children with history of measles				No. of children without history of measles			
		Seropositive ^a		Seronegative		Seropositive ^a		Seronegative	
		No.	%	No.	%	No.	%	No.	%
1	200	68	34.0	—	—	3	1.5	129	64.5
2	56	—	—	—	—	4	7.1	52	92.9
3	79	2	2.5	—	—	—	—	77	97.5
4	61	26	42.6	1	1.6	1	1.6	33	54.2
5	348	6	1.7	—	—	—	—	342	98.3
6	106	48	45.3	2	1.9	15	14.1	41	38.7
7	40	30	75.0	—	—	—	—	10	25.0
total	890	180	20.2	3	0.3	23	2.6	684	76.9

^a Sera with an HI titre of 1 : 20 or above were taken as positive (Mehta et al., 1972).

Table 3. Correspondence between history and serological results

Serial no. of study	No. of children serologically assessed	History corresponded with serum antibody results		History did not correspond with serum antibody results	
		No.	%	No.	%
1	200	197	98.5	3	1.5
2	56	52	92.9	4	7.1
3	79	79	100.0	—	—
4	61	59	96.7	2	3.3
5	348	348	100.0	—	—
6	106	89	84.0	17	16.0
7	40	40	100.0	—	—
total (A studies only)	688	684	99.4	4	0.6
total	890	865	97.2	25	2.8

bility of bias (other than stated above) the serological tests in each study were performed without any knowledge of the survey data, and the correlation was made only after the tests had been completed.

These data are presented to indicate the background information for the hypothesis that such surveys may be useful, and also to sound a warning against undertaking them without the necessary planning and preparation. The findings do not rule out the possibility of subclinical infection in measles

(Stocks & Karn, 1928; Bech, 1960; Snyder et al., 1962; Krugman et al., 1965). However, this appears to be a phenomenon of older children who are partially immune or with waning immunity, as suggested by Mehta,¹ and does not seem to be of relevance in infants or young children at first exposure to the disease.

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REFERENCES

- Bech, V. (1960) *Acta path. microbiol. scand.*, **50**, 322-330
 Krugman, S. et al. (1965) *J. Pediat.*, **66**, 471-488
 Mehta, N. A. et al. (1971) *Ind. J. med. Res.*, **60**, 661-669
 Shah, U. et al. (1972) *Bull. Wld Hlth Org.*, **46**, 130-138
 Snyder, M. J. et al. (1962) *Amer. J. Dis. Child.*, **103**, 250-251
 Stocks, P. & Karn, M. V. (1928) *Ann. Eugen. (Lond.)*, **3**, 361-398

¹ Mehta, N. A. (1970) *Seroepidemiology of measles*, Ph.D. Thesis, University of Bombay, India.