

SENSITIVITY OF NEONATAL TETANUS SURVEILLANCE SYSTEM IN INDIA

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Objective: To estimate the sensitivity of neonatal tetanus (NNT) surveillance in India. **Design:** A comparison of two sets of data obtained from NNT mortality surveys and routine surveillance system. **Methods:** NNT mortality surveys were undertaken in 1981, 1989 and 1992 using 30 cluster sampling technique. The data on reported incidence of NNT through routine surveillance system was taken from the published documents of Health Ministry and WHO. **Results:** In 1981, the incidence of disease in a national survey was estimated to be 4 and 16.4 per 1000 live births in urban and rural areas, respectively. Follow up surveys in 1989 and 1992 estimated the overall incidence as 4 and 1.74 per 1000 live births, respectively. Comparing the cases reported and estimated by surveys, around 10% of NNT cases were reported. **Conclusions:** There is an urgent need to strengthen the routine surveillance system which at present grossly under-reports the NNT incidence in India.

Key words: Neonatal tetanus, Surveillance.

INDIA has adopted two complementary strategies to achieve the goal of elimination of neonatal tetanus (NNT), *i.e.*, passive protection of newborns by active immunization of their mothers with aluminium-adsorbed tetanus toxoid (TT) during antenatal period, and safe delivery practices including appropriate cord care at the time of birth. The reported coverage levels for TT in pregnant women increased from 40% in 1985-86 to about 82% in 1993-94(1). Consequently, the reported annual incidence of NNT decreased from 22,588 (60% of tetanus in all age groups)(2) in 1985 to 6,606 in 1993(1).

Assessing the effectiveness of the

programme to prevent NNT requires effective surveillance to document trends in disease incidence, assess vaccine efficacy, and identify high risk individual and groups for special attention. The current reporting system is felt to underestimate the true incidence of NNT. This paper evaluates the current completeness of NNT reporting by comparing the reported number of NNT cases with the number estimated to be occurring by sample surveys carried out in 1981(3,4), 1989(5) and 1992(6).

Methods

The routine surveillance system collects data on vaccine preventable diseases from

all states in India. We took these data from the reports of Health Ministry(1) and World Health Organization (WHO)(7). Tetanus cases reported in 1981 pertained to all age groups.(7). We assumed that NNT constituted 60% of total tetanus cases(2).

The methodology used in NNT mortality surveys was based on a simplified cluster sampling method, developed and widely used to determine immunization coverage in children(8). In each NNT mortality survey, a sample of 2000 live births was sought in 30 randomly selected clusters. All deaths within one month of birth were investigated to determine the cause of death which provided the estimates of NNT mortality. Assuming 80% fatality of NNT(3), the disease incidence rates were calculated. The details of methodology and the results obtained in NNT surveys have been described elsewhere(4-6).

We compared two data sets to estimate the sensitivity of NNT surveillance. Since NNT mortality surveys were conducted in only 5 states in 1992, the surveillance data from these 5 states and the whole country

were separately compared with the survey data.

Results

Neonatal mortality surveys were carried out in 1981, 1989, and 1992. Details of these surveys are described in *Table I*. A total of 27, 41 and 10 NNT mortality surveys were carried out in 1981, 1989 and 1992, respectively. We averaged (mean) the results to estimate the NNT incidence in the country. The sensitivity of NNT surveillance was estimated by comparing the cases reported with that estimated by the survey; about 8-13% of NNT cases were officially reported.

Discussion

Baseline NNT surveys carried out in 1981 showed NNT was a major public health problem before the Expanded Programme on Immunization was started in India in 1978. As shown in *Table I*, the incidence was very high, especially in rural areas, and about 3,22,803 NNT cases were estimated to occur in 1981. Commensurate with the increase in TT coverage levels in

TABLE I-Sensitivity of NNT Surveillance in India, 1981-92.

Year	Incidence per 1000 live births*	Estimated cases	Reported cases	Sensitivity of surveillance (%)
1981	3.98 (urban)	322,803	24,697 ^{\$}	8
	16.39 (rural)			
1989	4.01	99,498	11,114 [@]	11
1992	1.74	12,532	1,665 [@]	13
(5 states)**				
1992	1.74 ⁰	44,079	6,687 [@]	15

* Mean incidence, assuming 80% NNT fatality.

\$ Source Reference 7, assuming NNT as 60% of total tetanus cases.

@ Source Reference 1, and Central Bureau of Health Intelligence.

** Haryana, Madhya Pradesh, Orissa, Maharashtra and Tamilnadu.

⁰ Incidence estimated in 5 states taken as national incidence.

pregnant mothers, a decline of about 86% was recorded in NNT cases during 1981-1992. Nevertheless, the sensitivity of routine surveillance system did not improve during this period; only around 10% of the cases were continued to be reported through routine surveillance system. It is a matter of concern and needs urgent attention because accurate incidence rates are necessary to guide immunization priorities and targets. The use of specialised NNT mortality surveys to estimate the incidence is very expensive and time consuming. Moreover, each NNT case reflects several failures of the maternal and child care services and therefore, should serve as an alarm, stimulating specific action to prevent future cases(9). In addition, since there are large differences in immunization coverage levels and NNT incidence rates within the states and districts, identification of high risk areas is essential for area specific intensification of preventive measures for maximizing impact. An effective surveillance system is necessary to identify high risk areas.

Completeness of reporting primarily depends upon two elements(2). First, the public must have access to health services and use them. Second, the health system must report cases accurately and regularly to the appropriate public health authorities(2). It is known that many cases of NNT, especially in rural areas, suffer and die without being taken to a health center because a high risk of death within first weeks of life is accepted as inevitable in many traditional rural communities in India. Even if taken to and seen in a health facility, NNT cases may not be reported. This loss of information within the health system may be a problem in both rural and urban areas.

It may be argued that in 1992, the surveys were carried out in two randomly

selected districts each in only five states, and therefore, the 10 district case studies can not be averaged to estimate the incidence of NNT in the country. However, since these 5 states were situated in different geographical regions of the country and were in different stages of programme implementation, they may give us a general idea of the NNT status in the country(6). Nevertheless, the sensitivity of surveillance in these 5 states was also found to be around 10%.

In conclusion, there is an urgent need to strengthen the routine surveillance system which at present grossly under-reports the NNT incidence in India.

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