

A Cluster Survey for Determination of Regular Vaccination Coverage among Children

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ABSTRACT

One of the objectives of the Expanded Program of Immunization (EPI) is to achieve and sustain vaccination coverage to >90%. The coverage is not uniform within the districts, some of the areas showing more than 100% while others are far behind. The objective of the survey was to determine the coverage of immunization among children 12-23 months of age in Rautahat District of Nepal.

A cross-sectional method was applied with the 30-cluster sampling method followed by taking a sample of 210 children. The structured questionnaire requesting information about socio-economic characteristics, vaccination, history of vaccination, doses of vaccines, and vaccination records were used for collecting data.

The coverage responses according to history from mothers for BCG, DPTHb-3, Polio3 and Measles immunizations were 96.7%, 90.0%, 97.6% and 78.1% respectively. By analyzing the records of the sampled Village Development Committees (VDCs), the coverage for the same vaccines was 88.1%, 78.1%, 79.0, 73.8% respectively. The drop-out of BCG versus measles was also very high. The District Health Office (DHO) reports were remarkably higher than the coverage of immunizations obtained by the survey, showing additional number of the target children.

Key words: coverage; cluster survey; immunization; vaccination

INTRODUCTION

The Expanded Program on Immunization (EPI) is a priority public health program of the Government of Nepal. Since immunization is one of the most cost-effective health interventions, the Government of Nepal is committed to reduction of morbidity and mortality due to vaccine preventable diseases (VPD).¹ To be fully immunized, a child should receive the following vaccinations: one dose of Bacillus Calmette-Guerin (BCG), three doses of Diphtheria, Tetanus, Pertussis and Hepatitis B (DPTHb), polio and one dose of measles vaccine. The national coverage of vaccination of the final year showed that overall coverage for BCG vaccination was 96.1%,

Diphtheria, Tetanus, Pertussis (DPT3), 93.0%, Polio-3, 91.9%, and Measles 87.5 %.²

The trend of regular vaccination coverage of EPI of Rautahat District was very high (Table 1) and has always been maintained higher than the targets set by the Departments of Health Services.³ However, the coverage was not uniform within the district, some of the area showing more than 100% while others were far behind. The drop-out of BCG versus measles was also very high (19.87%). Rautahat should be categorized as a problematic district in category-2 with high drop-out (>10%) and high coverage (>80%).⁴ Immunization coverage estimates are used to monitor

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immunization services, to guide disease eradication and elimination efforts, and are a good indicator of health system performance.⁵

The objectives of the study were to assess the coverage of immunization among children 12-23 months of age in the district, to determine the proportion of immunized children by respective health institutions and to determine the factors associated with low immunization coverage.

MATERIAL AND METHODS

A cross-sectional study by the 30-cluster sampling method recommended by the WHO was conducted in Rautahat District. A sample of 210 individuals, seven per cluster, was randomly selected. In the first stage, 30 clusters of villages were sampled with probability proportionate to the size of the population from a total of 96 Village Development Committee (VDCs) and one Municipality. The study population consisted of children of age 12-23 months and their mothers or care takers. The structured questionnaire requesting information about socio-economic characteristics of parents, immunization of the children and immunization records of health institutions of clustered VDCs were used for interviews for collecting data.

RESULTS

From a total of 210 mothers, 203 (96.7%), replied that their children had been vaccinated with BCG and non-vaccinated were 7 (3.3%). The children vaccinated with oral polio-3 was 205 (97.6%), and non-vaccinated were 5 (2.4%). Whereas 90% children received DPTHb-3 vaccine and 64 (78.1%) with measles vaccine. A total of 46 (21.9%) children were not vaccinated the measles (Table 1). Only 65 (31.0%) out of 210 respondents had vaccine card while 145 (69.0%) hadn't.

The HMIS records kept by the village health workers or maternal child health workers and records of the vaccine cards kept by the mothers showed the status of routine vaccination of the sampled children as BCG 185 (88.1%), DPTHb-3 164 (78.1%), Polio-3 166 (79.0%) and measles vaccine 155 (73.8%). The drop-out rate of BCG versus measles was 30 (14.28%) in the records of the health institutions (HI), less than that found in the District Health Office reports.

DISCUSSION

In the surveyed children according to the history from the mothers, the coverages of BCG, Polio-3 and DPTHb-3 vaccines are similar with the national coverage, except for measles. These are also identical with DHS as well as with the aggregate records of the health institutions of the clustered VDCs.² Measles immunization didn't reach the national standard level (95%). The coverage

of complete immunization for the children by the survey was 78.1%.

The coverage of all routine vaccines according to the survey was slightly higher than the records of the coverage of vaccines of the health institutions. The complete immunization coverage of the survey and of the DHS is similar. The coverage of vaccinations either by the survey (78.1%) or obtained from the records of the health institutions (73.8%) or by the DHS (80.1%) was noticeably lower than the reports of coverage sent by the district (99%). The district records included the additional number of target children who received immunization and were from outside of the district, from Bihar, India. Though a separate record was maintained for Indian children, it didn't cover all of them. Many might have escaped registration. The coverage of BCG of the district reports shows 123.3% with a big defaulter (19.87%). The average difference between the coverage of immunizations of the survey and the record of the DHO was 14.1, showing a lack of consistency. This shows inclusion of children not stable with the regularity of immunization. These children could be from outside of the district. On the other hand, the projection of the target population may not be adequately matching with the current population growth (2.75%) of the district.⁶ The vaccination service of the district may have attracted the people from parts of Bihar, India. The lower coverage of immunization of Bihar and U.P. States, 33% and 23% (11 October, 2007) respectively, may have compelled mothers to receive services from EPI centers of the district. The coverage of vaccination of Nepal is far better than that of India (44%) but very much similar with that of Bangladesh, being 81% and 88% for measles and DPT-3 respectively, as well as with that of Sri Lanka (99%) for the same.^{7,8}

Only 31.0% of mothers had vaccination cards. Not having the vaccination card was also an important factor for the high defaulter rate.

CONCLUSION

This study on immunization coverage will be useful for monitoring and evaluation of the EPI services and for meeting the challenges in improving the quality of services.

The excess or more than 100% coverage of immunization in children was due to the additional number of children coming from parts of Bihar of India, and also, to some extent, due to errors in estimating the target population.

ACKNOWLEDGEMENT

I gratefully acknowledge the constructive guidance of Dr. Sapon Iamsirithaworn, Department of Disease Control, Ministry of Public Health, Thailand.

Table 1. Immunization coverage (%) of children 12-23 months of age

Immunization (1)	Cluster survey by mothers (2)	HI records (3)	HMIS of DHO (4)	DHS (2006) (5)	Difference (4-2) (6)
BCG	96.7%	88.1%	123.3%	93.2%	(26.6)
DPTHb-3	90.0%	78.1%	109.5%	88.0%	(-2)
Polio-3	97.6%	79.0%	108.8%	90.5%	(-7.1)
Measles	78.1%	73.8%	98.8%	80.0%	(20.7)
Complete	78.1%	73.8%	99%	80.1%	

DHO = District Health Office, DHS = District health service

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