

## ■ Short Communication

# Vaccinating children against diphtheria, pertussis, tetanus and poliomyelitis in Nepal

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Nepal is a landlocked country lying at the lap of Himalayas, sandwiched between two populous countries of world; China from north and India from west, south & east. The country total land area is 147,181 square kilometers with densely populated just over 23 million. Administratively, the country has been divided into five regions: eastern, central, western, mid-western and far-western with 14 zones, 75 districts and finally the smallest unit called village development committee (VDCs) and municipalities. Topographically, it is divided into three ecological zones; mountain, hill and terai (or plains). Among these zones, terai is the heavily populated and is occupies 23 percent of total land area of Nepal.<sup>1</sup>

The national health policy for Nepal was adopted in 1991 to bring about improvement in the health conditions of the people of Nepal, emphasizing on preventive health services, promotive health services, curative health services, basic primary health services, ayurvedic and other traditional health services, community participation, human resources for health development, resource mobilization, decentralisation and regionalization, drug supply, and health research.<sup>22</sup> Annual Report, Department of Health Service 2007/

**Table: National Immunization Programme (EPI) in Nepal**

| Name of Vaccines | Prevents against                       | Time of vaccination                                                |
|------------------|----------------------------------------|--------------------------------------------------------------------|
| BCG              | Tuberculosis                           | Birth or as soon as possible                                       |
| DPT              | Diphtheria, Whooping cough and Tetanus | 1st dose at 6 weeks, 2nd dose at 10 weeks and 3rd dose at 14 weeks |
| OPV              | Poliomyelitis                          | Along with DPT                                                     |
| Measles          | Measles                                | 9 months of age                                                    |

*Nepal Paediatric Society Guidelines for Childhood Immunization*

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The existing EPI programme of Nepal delivers the following vaccination free of cost in different health facilities (hospitals, health centers, health posts and sub health posts) including the private sector health delivery institutions. These vaccines are BCG, DPT, Polio, Measles and Tetanus. These vaccines are termed as essential vaccines. NEPAS recommends that these essential vaccines be given to all infants before the age of one year as per National Immunization schedule shown below ( in cases where these are not completed before the age of one year, they should be completed at the earliest opportunity there after:

The objectives and activities set forth in this Multi-Year Plan of Action<sup>3</sup> provide the framework required to meet the previously stated goal of “reducing infant and child mortality and morbidity associated with vaccine -preventable diseases (VPD).” Further, this Plan addresses new challenges and expands the previous Plan by providing guidelines for the introduction of new vaccines.

## Districts of CORE Polio Eradication Initiative in Nepal

Household Survey for CORE Group Polio Project Baseline Assessment – Nepal,<sup>4</sup> was conducted in 2008. It was carried out in eight districts of terai region categorised into three program area. The survey

respondents were household mothers having children of age 12-23 months. The survey adopted self-weighting 30 cluster sampling in each program area with the sample size of 300 household per program area with total 900 samples. Among 900, 843 samples matched the respondent criteria (mother of children age 12-23 months). The study results have shown majority of mother were in the age group 25-29 years. Respondents' ethnic classification was dalit/disadvantage. Almost half of the mothers were found literate; however the completed grade of education to primary, secondary and higher education is low.

Female Community Health Volunteer (FCHV) acquaintance to respondents seems good; thence FCHV as source of information on polio vaccination was comparatively higher than other source option. One quarter of respondent know appropriate time of first dose of polio vaccine.

Mothers' ever having immunization card percentage was almost 90% but, card containing respondents on the date of interview was one fourth (22%). Almost all respondent's child had ever received polio vaccination during campaign. Majority of respondent administered polio vaccine for more than five times. The vaccination coverage of DPT/Hepatitis B was 97%, but the percentage of DPT/Hepatitis B third dose administration was 70%. Half of the respondents had heard/seen acute flaccid paralysis and knows that child cannot walk on sudden AFP.

Regarding Polio campaign awareness and reach, seven in ten respondents know the last polio campaign dates. Largely it was FCHV and radio that was mentioned as source of information for last polio campaign. The volunteer involvement in household visit was considerably high i.e. >80%. Almost all respondents expressed that polio vaccine can be given repeatedly to their child and it does not harm to their child irrespective of number of vaccination. But, respondents specifically mentioned sick children should not receive the polio vaccine. This shows there is still need to provide health education among the mother.

#### **Progress towards elimination of DPT in Nepal**

DPT refers to Diphtheria, Pertussis and Tetanus which are vaccine preventable diseases of childhood. Diphtheria is an acute bacterial disease involving primarily tonsils, pharynx, larynx and nose of the non-immunized children below 15 years of age. Pertussis

is also an acute bacterial disease involving the respiratory tract and Tetanus is another disease induced by an exotoxin of the bacteria, characterized by painful muscular contractions, primarily of the masseter and neck muscles, and secondarily of the trunk muscles.<sup>5</sup> It has been reported in the country report, the incidence rates of DPT were 14.5, 436.6 and 5.9 per 100,000 populations respectively in Nepal. The incidence rate of Neonatal tetanus was 21.9 per 1000 live births.<sup>6</sup>

The incidence of pertussis and diphtheria for all age has shown constant decrease for both diseases.

However, pertussis cases were seen maximum in 1995 and 1997. This might be due to epidemics in those years. But in many cases, case definition has not been used in the diagnosis of the disease, on the other hand, system for laboratory confirmation may be lacking due to untrained health workers, which results difficulties in true estimation. . Reported data has shown a decline in pertussis cases from 63/10,000 in 1998 to 26/10,000 population in 2002 and similarly overall incidence rate of diphtheria declining from 2.2/10,000 in 1998 to 1.6/10,000 in 2002.<sup>7</sup>

#### **Immunization and its coverage**

One of the most cost-effective programmes in reducing infant and child morbidity and mortality is Universal immunisation of children under one year of age against the six vaccine preventable diseases (tuberculosis, diphtheria, pertussis, tetanus, poliomyelitis, and measles). The expanded programme of immunisation is a priority programme for the Government of Nepal.

Major objectives of the programme are (i) to achieve and sustain 90% coverage for DPT3 by 2008 and of all antigens by 2010 (ii) to maintain polio free status (iii) to sustain MNT elimination status (iv) to initiate measles elimination (v) to expand vaccine preventable diseases surveillance (vi) accelerate control of other vaccine preventable diseases (vii) to improve and sustain immunization quality and (viii) to expand immunization services beyond infancy.<sup>7</sup>

The National Immunisation Day is observed annually every year with broader participation of local communities, NGOs and volunteers. A high level inter-agency coordination committee has been formed for coordination of immunisation programmes with representatives of the World Health Organisation (WHO), the UNICEF, the JICA and NGOs and private

philanthropic organizations. The coverage and achievement made are shown in the table 2. Vaccine coverage has slightly decreased in fiscal year 2007/08 years. It is mainly due to strengthening of programme management and monitoring measures at various levels.

Ending the transmission of wild polio virus is polio eradication and certification is the process, which verifies that a region and eventually the entire world is polio-free. In 1991, last case was found in the America. The region was certified in 1994 as a polio-free region. The government of Nepal is on the process to make the country a polio-free nation. This is not only the responsibility of government, but also has equal responsibility of all sectors i.e. private, non-governmental and semi-governmental agencies, without active participant of all sector it is not possible to declare it.

Disease surveillance to find and investigate every newly paralyzed child, laboratory containment of the virus, and certification activities need to continue every where until anticipated global certification in 2005. During this period, consensus for a strategy for stopping immunization will be developed. Stopping immunization against polio is the ultimate objective of the eradication initiative and will yield annual savings of US dollar 1.5 billion. WHO anticipates that it will be possible to stop immunizing against polio once the virus is eradicated and safely contained in laboratory.<sup>8</sup>

Nepal's immunization program targets children under one year of age for childhood immunizations and targets pregnant women for tetanus immunization. The Child Health Division, through the National Immunization Plan, aims to reach all children through routine and supplemental immunization sessions. Special emphasis will be given to reach un-immunized children through effective district micro planning. Further, second opportunities for immunization will be provided to children in grades 1, 2 and 3 through school-based immunization programs.

### **Reporting system in Nepal**

Data from all outreach session and static clinics are recorded and collected in immunization registers of the local health institutions such as SHP, HP and PHC. The compiled records are then forwarded to DHOs. DHOs categorize VDC data by coverage, dropout rates and numbers of non-immunized children to

identify high- and low performing VDCs. DHOs are responsible for ensuring that overall coverage meets the targeted objectives. DHOs compile, analyze, and send coverage reports to the Health Management Information System (HMIS) and the RHD every month. At each level, coverage data are entered into immunization monitoring charts; the charts have to be completed every month and displayed for the use of health workers and community people for monthly monitoring<sup>3</sup> purpose.

There is an existing system to review data produced by the districts at the regional and central levels; the district health staff have been oriented for LQAS and DQSA to validate their own data. A DQA, conducted in 2003 by external auditors with the support of GAVI, observed that the reported data on immunization was not much different from what was verified. Hence, Nepal was selected as an eligible country for reward money from GAVI.

### **Linkages with the private sector**

All private agencies providing vaccinations should give family-retained immunization cards and also maintain appropriate records in the immunization register that must be retrievable on demand. As vaccines are collected from government sources, a regular utilization report should be submitted. Health functionaries should be provided these documents on demand using HMIS format. All immunization-providing organizations should be included to assist in building public-private partnerships.

### **Health system weakness affecting immunization**

1. Although there are well-established policies, strategies and priorities for immunization, implementation has not been equitable; there are large disparities in coverage among ethnic groups, geography and gender (DHS 2006).
2. Although the government has a high priority for decentralization, there is still poor capacity and resources available at district levels for planning and implementation. There is a need to develop district-level micro planning for EHCS (not only immunization micro planning) that can address the issue of equity and target integrated services delivery to disadvantaged communities.
3. The HMIS system is well established and functioning well, but data at the district level and below are manually entered and tabulated. This

has resulted in delayed reporting and inconsistency in data reporting. District level managers and supervisors need to be trained in computer and data management.

4. There are 48,000 female community health volunteers who serve as a most important link between the health system and communities in rural parts of Nepal. They are regarded as the backbone of the health system in Nepal. But, there are no FCHVs in municipalities. There is also a challenge to sustain volunteers over time.
5. The quality and skill of HRH who deliver services at the lowest levels of HP and SHP are low; they need more intensive training and regular updating. Frequent and high turnover of higher-level staff hamper service delivery (especially in BEOC and CEOC.)
6. Forty-three districts out of 75 do not have adequate physical infrastructure such as storage, maintenance systems for infrastructure and equipment. Supervision and communication systems with health facilities are weak. The remuneration given for supervision is very low and is not enough to cover the minimum cost of living while conducting supervision. This has led to poor motivation for quality supportive supervision. Transportation cost allocated by the government is not adequate.
7. Present literacy rates, especially among women, and awareness of health and healthy practices are low.
8. Nepal's terrain and difficulty in transportation and communication is a big constraint to service delivery. Many districts do not have IT facilities. Due to the lack of telephones in most of the HPs and SHPs, there is a problem with communication and timely reporting for action. Lack of communication has led to the isolation of these facilities, problems in communication and the timely supply of vaccine and essential drugs.

In context of Nepal, FCHVs are doing better jobs in their level. They should be provided further training to enhance their skill and motivate them to the health awareness, preventive and the basic health treatment among the mother. There is no doubt EPI is a priority program in the country and it is successfully running in Nepal and also has significant contribution towards reduction of infants and child mortality. However, for

the polio-free world, every child counts. We can assist the polio eradication initiative by ensuring that the polio vaccine reaches every single child in our neighborhood and community, and by making sure that any new paralysis case among children in the community is promptly reported to the health authorities for diagnosis. We should also insure in the national immunization days that volunteer and community leaders are actively involving in identifying houses with young children so that every single child is reached.

The published literatures and reports are more focused on DPT immunization coverage rather DPT diseases. The striking reduction in deaths and in the incidence of these diseases has been closely associated with the introduction of specific vaccination program. Effective and efficient surveillance system and strengthening the routine immunization against DPT are the key steps for elimination of DPT disease.

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