National Immunization Program of Nepal

Reaching Every Village

Multi-Year Plan of Action
2007 – 2011

Ministry of Health
Department of Health Services
Child Health Division

ACRONYMS

ADS	Auto-disable Syringes
AEFI	Adverse Events Following Immunization
AFP	Acute Flaccid Paralysis
BCC	Behavior Change Communication
BCG	Bacille Calmette-Guerin
CDR	Central Development Region
CHD	Child Health Division
DFID	Department for International Development
DHO	District Health Office/District Health Officer
DoHS	Department of Health Services
DPHO	District Public Health Office/District Public Health Officer
DPT	Diphtheria, Pertussis, Tetanus Vaccine
DQS	Data Quality Sampling
EDCD	Epidemiology and Disease Control Division
EDR	Eastern Development Region
EWARS	Early Warning and Reporting System
FCHV	Female Community Health Volunteer
FHD	Family Health Division
FSP	Financial Sustainability Plan
FWDR	Far Western Development Region
FY	Fiscal Year
GAVI	Global Alliance for Vaccines and Immunization
GTZ	German Technical Cooperation
Hep B	Hepatitis B
Hib	Haemophilus Influenza Vaccine
HMG	His Majesty's Government of Nepal
HMIS	Health Management Information System
HP	Health Post
ICC	Interagency Coordination Committee
JE	Japanese Encephalitis
JICA	Japan International Cooperation Agency
LMD	Logistics Management Division
MLM	Mid-level Manger
MoHP	Ministry of Health and Population
MoLD	Ministry of Local Development
MMR	Measles, Mumps, Rubella Vaccine

MNT	Maternal and Neonatal Tetanus
MR	Measles and Rubella Vaccine
MWDR	Mid-western Development Region
NFHP	Nepal Family Health Program
NGO	Non-governmental Organization
NHEICC	National Health Education, Information and Communication Center
NHTC	National Health Training Center
NID	National Immunization Day
NIP	National Immunization Program
NPHL	National Public Health Laboratory
NT	Neonatal Tetanus
OPV	Oral Polio Vaccine
PEN	Polio Eradication Nepal
PHC	Primary Healthcare Center
RHD	Regional Health Directorate
SHP	Sub Health Post
SIA	Supplemental Immunization Activity
TT	Tetanus Toxoid
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
VDC	Village Development Committee
VPD	Vaccine-Preventable Disease
WDR	Western Development Region
WHO	World Health Organization

Contents

Chapter 1

Executive Summary

This Multi-Year Plan of Action supercedes Nepal's National Immunization Program 2002-2007 Plan. It covers the fiscal years 2007-11.

The objectives and activities set forth in this Multi-Year Plan of Action 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.

Objectives

1. Achieve and sustain 90 percent coverage: DPT3 by 2008, all antigens by 2010
2. Maintain polio-free status
3. Sustain MNT elimination status
4. Initiate measles elimination
5. Expand VPDs surveillance
6. Accelerate control of other vaccine-preventable diseases through introduction of new vaccines
7. Improve and sustain immunization quality
8. Expand immunization services beyond infancy

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 unimmunized 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.

Chapter 2 provides a general introduction to health services in Nepal and to the National Immunization Program in particular. This chapter addresses the need for supportive government institutions and involvement of private healthcare providers in the National Immunization Program. This Multi-Year Plan suggests ways to improve coverage by making consistent use of quality Behavior Change Communication messages and integrating immunization activities into other health interventions. Further, the Plan draws attention to the need for continuous surveillance of infectious diseases, timely and thorough reporting of immunization coverage and disease burdens and total awareness of safe health practices. Aligned with these factors are requirements for adequate staffing levels and the ongoing training of all immunization-related staff. Potential bottlenecks are identified and are addressed in the Plan.

Chapter 3 explains the country profile covering the geographic, demographic and economic situation of the country.

Chapter 4 deals with the situation analysis and looks at the disease burdens, antigen coverage and current immunization trends. Existing activities and systems are assessed. Although the National Immunization Program has made substantial progress in the last ten years by maintaining high levels of coverage with all routine antigens, still the immunization coverage is not uniform throughout the country. The Ministry acknowledges the importance of introducing strategies that expand the program into the most remote, under-served, disadvantaged and mobile communities so that immunization reaches every person in every village throughout Nepal.

Chapter 5 presents the Plan's goals, objectives, and milestones. The highest priority will be given to assuring that routine coverage achieves and is sustained at 90 percent or greater in all districts and 85 percent or greater in all VDCs, that a polio-free environment is maintained, that maternal and neonatal tetanus is eliminated and that measles mortality is significantly reduced. Financial and technical resources will be directed toward ensuring that these basic healthcare priorities are met before proceeding with additional objectives.

Chapter 6 lays out strategies directed toward eliminating weaknesses. The activities advanced will strengthen functions that support the Program and will lead to the successful attainment of objectives within time lines.

Chapter 7 contains costing, financing and future resource requirements. The Financial Sustainability Plan developed by the government in February 2005 indicates that Nepal can sustain the immunization program for traditional vaccines. However, external support will be extremely critical in introducing new and under-used vaccines such as Haemophilus Influenza, Measles/Rubella and others, as well as for supplemental campaigns directed toward polio and measles eradication. The government recognizes the funding risks and, in addition to exploring various additional funding sources, it is reviewing program efficiency and the impact of slowing down the introduction of new vaccines. Looking toward the future, the Plan foresees an expanded, cost-effective National Immunization Program that reduces child morbidity and mortality and eventually eradicates vaccine-preventable diseases in Nepal.

Chapter 2

Introduction

This Comprehensive Multi Year Plan (cMYP) of the immunization program is a tool to set priorities, mobilize resources and use resources effectively throughout the program. Broadly, this process leads to improvements in health status, contributes to poverty alleviation and eventually results in higher levels of economic development to achieve the Millennium Development Goals (MDG). A financially sustainable Comprehensive Multi-year Plan is needed for Nepal where total pubic health expenditure is low and private out of pocket expenditure is three-fourths of total health expenditures. Public health expenditures were only 6.4 percent in 2006 (government plus grants and loans).

Health indicators show that Nepal still has a long way to go in achieving the levels of health outcomes observed in most countries of the world, including other countries in the region. For example, in 2006, the infant mortality rate was 51 per 1000 live births, child mortality rate 65 per 1000 live births, crude birth rate was 31 and crude death rate was about 9. These health figures are generally below the average for the South Asian Region and are high by international standards.

The government of Nepal acknowledges that the National Immunization Program (NIP) has significantly contributed to improving the health indicators of the population. The NIP has a relatively recent genesis: it started in 1979 and had been discussed in earlier documents such as the Fifth National Development Plan and the First Long Term Health Plan (FLTHP, 1975 – 1990). Since then, there has been a targeted focus in delivery of primary health care services (up from the grass root level) reflected in the 1991 National Health Policy and the subsequent development of the Second Long Term Health Plan (SLTHP, 1997 – 2017). Despite this, there has been a growing concern about not being able to achieve better health outcomes for children at a faster pace and about the efficacy of public health expenditures, especially for sustaining the program.

A strategic analysis to implement the SLTHP was undertaken and a Medium Term Strategic Health Plan (MTSP) logical framework was prepared in 2000. This, along with the concept paper for the Tenth Development Plan embodied in the Interim Poverty Reduction Strategy Paper (I-PRSP), was developed and discussed at the last Nepal Development Forum held in Kathmandu in 2004. Following the guidelines of the I-PRSP, the Tenth Plan (Poverty Reduction Strategy Paper, 2002-2007) has been developed with the long term prospective of Nepal's development. These strategies were translated into the "Health Sector Strategy: An Agenda for Reform," in 2003. Following this, the "Nepal Health sector Program - Implementation Plan" (NHSP-IP, 2004) was prepared in order to apply the strategies.

The first step toward a financial planning exercise for the NIP was taken a year ago, when the country prepared the Financial Sustainability Plan (FSP) and submitted it to GAVI. Since then, the FSP exercise has been dovetailed more effectively into a comprehensive Multi Year Plan (cMYP) based on a tool developed jointly by GAVI-

WHO-UNICEF. Developing a cMYP also gives an opportunity to consolidate existing plans into a single document that addresses national and sub-national immunization objectives, which are broadly consistent with global aims.

Thus, the cMYP has the potential to help the government and its partners identify key financing issues, develop targets for sound financing that are consistent with the program objectives and agree about specific steps to move toward those targets. The methodology of developing the cMYP is based on information and analyses of various plan documents. Critical input and feedback were obtained from a series of discussions and meetings with stakeholders, policy makers, and ICC members.

Chapter 3

Country Profile

Nepal lies in the lap of the Himalaya between latitudes 16.22' and 30.27' north and longitudes 80.4' and 88.12' east. It has its northern boarder with the Tibetan Autonomous Region of the People's Republic of China and eastern, western and southern boarders with India. It covers a total land area of 147,181 square kilometers.

Topographically, Nepal is divided into three distinct ecological zones: the mountain (Himal), hill and plain (Terai). The mountain zone ranges in altitude from 4,877 to 8,848 meters above sea level and covers a land area of 51,817 square kilometers. Only seven percent of the population live there because of the harsh terrain; transportation and communication facilities in this zone are limited. The hill zone, which ranges in altitude from 610 to 4,876 meters, is densely populated, with about 44 percent of the population living in this zone, which covers an area of 61,345 square kilometers with fertile valleys. The southern Terai zone is like an extension of the relatively flat Gangetic plains, and is the most fertile part of the country. This zone covers only 23 percent of the total land area but is home to 49 percent of the population.

Climatic conditions in Nepal vary substantially with altitude. In the Terai, the temperature rises up to 440C in the summer and falls to 50C in winter. The corresponding temperatures for the hill and mountain areas are 410C and 300C respectively in the summer and 30C and far below 00C respectively in the winter. The mean annual rainfall is about 1500 millimeters. (CBS 1996)

For administrative purposes, Nepal is divided into five development regions, 14 zones and 75 districts. Districts are further divided into 3,914, Village Development Committees (VDCs) and 58 municipalities.

The demographic details are presented in the following table.

Table No 3.1 Demographic Situation 2006

Demographic Situation:	
Year of last population census	2001
Total Population	26,239,521
Population Growth Rate	2.24%
Birth Rate	30.10%
Infant Mortality Rate	51 per 1000 live birth*
Maternal Mortality	539/10000
Under 1 year population	747,567
Expected Pregnancy	961,241

*Data Source: HMIS and * DHS Survey 2006*

Economically, Nepal is one of the poorest countries in the world with a per capita GDP of around $250 (2003). The currency is the Nepalese rupee (NRS); in January 2006 US$1 bought approximately 73 Nepalese rupees. Unemployment is a huge problem and many Nepalese although largely unskilled, work abroad, bringing more money into the economy than tourism, foreign aid and exports combined. Current indications show that Nepal is emerging as a remittance economy. Per capita income is NRS 15,162 (equal to US$ 207 in 2005). Inflation has been approximately 5-8 percent. Poverty is pervasive, though it has decreased in recent years (42 percent of the population lived below the poverty line in 1996 (NLSS), dropping to 32 percent in 2004 (NLSS). However, the level of poverty varies widely with the various geographical/ethnic/ecological conditions. Mountain and hill regions are the worst effected with approximately 56 percent of the people there living in absolute poverty. While only 15 percent of households are connected to the electricity grid, 80 percent have access to an improved water supply.

In 2001, the "human development index" for Nepal was 0.49 (follow MDG), which is among the lowest in the region. The government of Nepal attaches great importance to poverty alleviation in its planning documents. To help address the poverty issue, a Comprehensive Poverty Reduction Strategy Paper (PRSP) has recently been developed as part of the Tenth National Development Plan (2002-2007). This presents a vision of a transition toward poverty reduction and bridging the urban and rural dichotomy.

Nepal has a well-developed planning system whereby developmental plans are made every five years. Currently the Tenth Development Plan (2002-2007) is in implementation; this plan includes the PRSP mentioned above.

Total government expenditure in 2005 was approximately $54 per capita, which is about one-fourth of GDP. Two-thirds of that amount is from the regular budget; one-third is

from the development budget. Eleven percent of government expenditures were used for debt repayment. Approximately 60 percent of the government budget comes from domestic revenues, 15 percent from foreign aid and 25 percent through borrowing. The real percentage of foreign aid to Nepal is much higher, as a substantial percentage does not go through the Ministry of Finance and is not accounted for in the comprehensive budget (Red Book). This is particularly high in the health sector (as much as 90 percent), which is one of the reasons for the relatively low government expenditure in the health sector.

The Public Expenditure Review of the Health Sector, Ministry of Health, 2004 gives the detailed breakdown of public expenditure on health, which is useful to keep in mind (although it is only through 2002-03), while looking at financing constraints of programs like the EPI.

Table No 3.2: Summary of public expenditures on health

Sources of Financing	2000/01	2001/02	2002/03
	%	%	%
Government of Nepal	**52.4**	**64.0**	**63.5**
Development	18.2	24.7	20.3
Regular	29.2	35.8	39.8
Earmarked tax	5.1	3.6	3.4
External Development Partners	**35.1**	**24.9**	**32.7**
Direct	26.0	20.4	24.3
Indirect	9.0	4.5	8.4
State-owned enterprises	**10.0**	**9.9**	**2.7**
Autonomous universities	**0.4**	**0.3**	**0.4**
Local bodies	**2.1**	**0.8**	**0.7**
District Development Committees	0.6	0.2	0.1
Municipalities	0.3	0.0	0.1
Village Development Committees	1.2	0.6	0.5
Total public spending	**100**	**100**	**100**
As % of GDP*	1.99	2.04	1.76
Per capita public spending (NRS)	328.9	340.0	303.6
Per capita public spending (US$)	**4.41**	**4.36**	**4.06**

Source: Public Expenditure Review of the Health Sector, Ministry of Health, 2004

Chapter 4

Situation Analysis of Immunization Program in Nepal

The National Immunization Program (NIP) is within the Child Health Division (CHD) of the Department of Health Services (DoHS). The work of the NIP is supported by the Logistics Management Division (LMD). In addition, the National Public Health Laboratory (NPHL), the National Health Education, Information and Communication Center (NHEICC), the National Health Training Center and the Epidemiology and Disease Control Division (EDCD) provide critical support to the NIP.

In 1979 Nepal piloted the EPI in three districts (Bara, Kaski and Bhaktapur) to control VPDs with two antigens (BCG & DPT). By 1989 the program had been expanded to all 75 districts with six antigens. Currently the NIP provides services through the recommended antigens for seven VPDs: oral polio vaccine (OPV), diphtheria-pertussis-tetanus vaccine (DPT), tetanus toxoid (TT), Bacille Calmette-Guerin (BCG) for tuberculosis, measles vaccine, and hepatitis B (Hep B vaccine. Tetravalent vaccine (DPT-Hep B) immunization was started with GAVI assistance in 2005-06.

The immunization program in Nepal is a governmental high priority program. Although immunization services are mainly delivered through the government health network there is an increasing trend of immunization service delivery through the private sector. In the private sector, immunization services are delivered through private clinics, hospitals, nursing homes as well as NGOs. The government supplies all vaccines and immunization-related logistics to these private institutions free of cost. All vaccines under the National Immunization Program are given free of cost or there is no cost sharing/ recovery.

According to the DoHS's 2004-2005 Annual Report, the Department provides basic health services through 89 hospitals, 186 Primary Healthcare Centers (PHC), 697 Health Posts (HP) and 3,429 Sub Health Posts (SHP). The NIP operates about 15,000 immunization static, outreach or mobile clinics per month (three to five clinics per VDC every month), depending on the population size and geography. Basically the vaccination is done by VHW/MHW and AHW supported by Female Community Health Volunteers. In most of the static immunization clinics (hospitals, PHC and other health facilities) immunization services are provided by paramedic staff.

In addition to the health services provided by the DoHS, 58 municipalities are responsible for conducting individualized health programs. For immunization programs, the government provides vaccines and immunization-related supplies; however, there is insufficient systematic coordination among the municipalities and the DoHS's District Health Offices (DHOs) and the District Public Health Offices (DPHOs). Poor immunization coverage in urban area,s especially slums and peri-urban areas where migrant families live, is a major concern because of weak immunization infrastructure within the municipalities. Improving coordination with private practitioners, NGOs, and

urban health staff should be undertaken as a priority to improve immunization services in such areas.

Regular supervision of immunization service delivery, especially the regularity and the quality of the sessions, has been problematic due to the shortage of human resource and lack of resources especially in larger municipalities.

Target Groups

The NIP targets children younger than one year of age (infants) for childhood immunizations and pregnant women for TT immunization. In addition, second opportunities are provided for measles vaccination through campaigns for children nine months to 14 years in 2004/2005 and OPV for children younger than five year during SIAs. As Nepal achieved maternal and neo-natal tetanus elimination in 2005, the School Immunization Program has been initiated in a phased manner with TT vaccination targeted to grade 1, 2, and 3 children to sustain achieved elimination status.

Gap:
As there is no proper recording/reporting of birth at VDC level, the projected population does not match with the exact population.

The table below provides a schedule for immunizations at different ages.

Table No 4.1 Immunization Schedule

Immunization Schedule		
Type of Vaccine	Number of Doses	Recommended Age
BCG	1	At birth or on first contact
OPV	3	6, 10, and 14 weeks of age
DPT - Hep B	3	6, 10, and 14 weeks of age
Measles	1	9 months of age
TT	2	Pregnant women
JE	1	12-23 months (proposed)

The NIP has a lead role in all immunization-related activities at the national level and coordinates actions with other divisions of the DoHS. The Regional Health Directorate (RHD) acts as a facilitator between the central and the district levels. It is the responsibility of the D(P)HO to ensure that a successful immunization program is implemented at the district level. The District health office, EPI section, looks after district-level immunization programs. Each district is staffed with at least one EPI supervisor and one cold chain assistant. Primary Health Centers (PHCs), Health Posts (HPs), and Sub-Health Posts (SHPs) implement immunization programs in their Village Development Committees (VDCs).

Gaps:
Coordination of immunization strategies and services among all MoH&P divisions, municipalities, and NGOs is critical to the success of the National Immunization Program. Participation of private healthcare providers would improve immunization coverage.
To effectively and efficiently control childhood VPDs, sufficient skilled staffing is essential. Staff at all levels and in all immunization-related units need increased training opportunities.

Delivery of Services

The NIP tackles VPDs through routine immunization and through supplemental immunization programs.

Routine Immunization

The DoHS delivers routine immunization through fixed health facilities, outreach programs and mobile teams.

- Fixed facilities: Immunization services are provided at hospitals, primary healthcare centers, health posts and sub health posts. Some health facilities equipped with refrigerators provide immunizations daily and some provide them weekly.
- Outreach services: Outreach services provide access to people who have difficulty reaching health facilities due to distance and travel issues; three to five immunization sessions a month are conducted at several locations in each VDC. The frequency of outreach services is based on village setting, population density, and seasonal variations. These sessions account for more than 90 percent of immunization coverage.
- Mobile teams: Mobile teams serve geographically remote areas with difficult access, areas where there are limited or no health workers and where there is poor access for the target population to routine immunizations. These areas are identified and appropriate strategies developed during micro planning. To address these issues, at least four visits per year from mobile teams should be implemented.

Supplemental Immunization Activities (SIA)

Supplemental immunization activities are designed to control and eradicate childhood diseases. These are measles and JE, MNT and polio respectively. In addition to health workers, political leaders, volunteers, social workers, and civil society are mobilized to support SIAs.

Human Resources Involved in Immunization

Many institutions are involved in immunization with contributions ranging from small to large, but the leading role for immunization at the national level lies with the Immunization Section, CHD. However considering the rapid expansion of introduction of new vaccines and programs, the Immunization Section in CHD is under-staffed.
At the service delivery level presently, there are two vaccinators assigned for one VDC without considering the size of the VDCs or the population of the community. Depending

on the density of the population, districts should have a plan to conduct mobile immunization session (at least four visits per year) in remote areas and areas with a sparse population.

At present, some of the vaccinator (VHW) posts are vacant and some VHWs are physically disabled. There is neither a plan for early retirement nor a provision for recruitment of new vaccinators to replace them. There are many health institutions where MCHW is not in place due to their promotional study program. In the absence of MCHWs and VHWs, health facilities' in-charge or other technical staff are supposed to conduct immunization sessions. This is not happening on a regular basis, and therefore every year there is a gap in the number of sessions planned and the number of sessions actually conducted.

Impact of Immunization

The decline in morbidity due to immunization is evident from the next table.

Table No 4.2 VPDs morbidity data in Different Fiscal Years

Reported Morbidity from vaccine preventable diseases (VPDs):						
Fiscal Year	AFP*	Measles	Diphtheria	Whooping cough	Neonatal Tetanus	Tetanus
2000/01	211	10849	390	5908	327	440
2001/02	186	6749	108	4683	92	241
2002/03	197	13344	173	4479	51	114
2003/04	192	12074	81	3708	27	77
2004/05	231	5,023	46	2,170	29	83
2005/2006	323	2,845	72	1,097	42	198

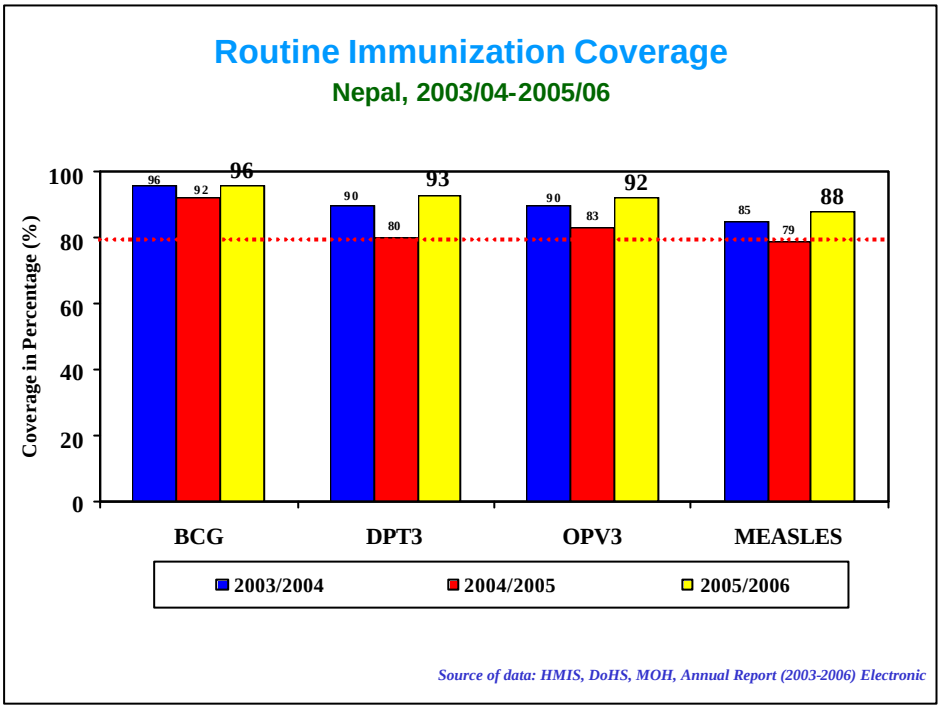
** Source: WHO/IPD. Other data are from HMIS.*

Gap: Traditional VPDs seem to be decreasing; however the burden of other vaccine-preventable diseases is not known.

Three indicators are taken into consideration for the monitoring of the National Immunization Program: coverage, drop out rates and vaccine wastage rates. These are calculated by districts and monitored. The districts will monitor VDCs wise performance. The following tables and graphs show the status of the monitoring of the NIP.

Nepal has achieved a level of >80 percent coverage for almost all antigens. This is evident from the following figure.

Figure No 4.1 Routine Immunization Coverage, Nepal



Gaps:

- Though the coverage level of 80 percent has been achieved, a significant number of infants remain unvaccinated.
- Coverage is not uniform in all the districts and even in the VDCs.
- Poor coverage in municipalities.

Table No 4.3 Immunization Coverage (Percent), by Region, FY 2059/60 to 2062/63

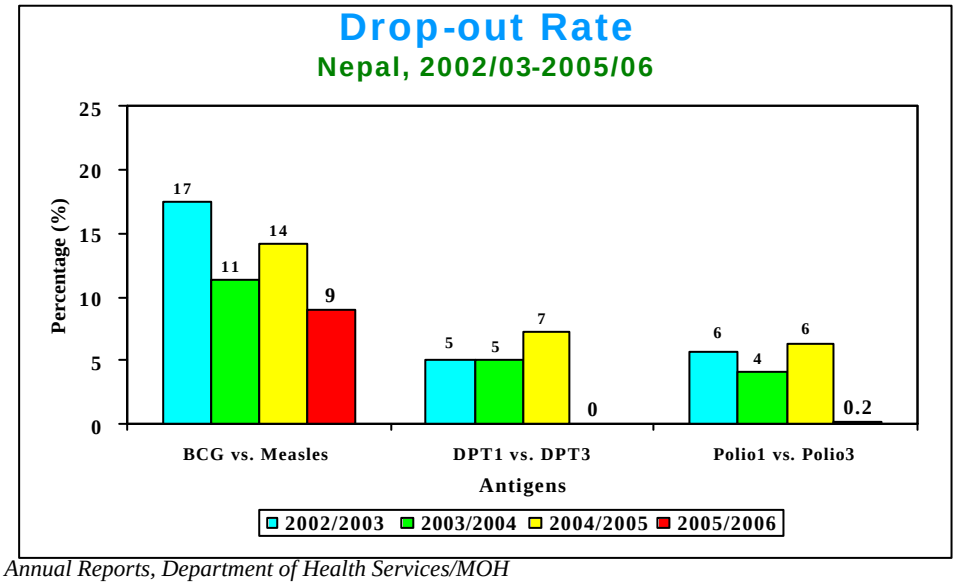
Indicators	Year		Region					National Total
			EDR	CDR	WDR	MWDR	FWDR	
BCG (<1 year)	2059/60	2002/03	95.8	110.7	88.1	89.8	85.9	97.0
Coverage	2060/61	2003/04	97.3	106.1	88.5	92.9	85.0	96.3
	2061/62	2004/05	94.3	102.5	86.1	86.3	79.7	92.4
	2062/63	2005/06	97.3	103.5	87.6	96.9	86.7	96.1
DPT3 (<1 year)	2059/60	2002/03	86.9	97.2	79.9	78.8	74.5	86.2
Coverage	2060/61	2003/04	94.0	97.5	85.5	85.3	77.5	90.3
	2061/62	2004/05	82.6	83.2	80.9	73.8	72.8	80.0
	2062/63	2005/06	95.8	98.0	84.4	91.3	84.8	93.0
	2059/60	2002/03	83.0	86.2	76.5	78.6	71.0	84.0
Polio3 (<1 year)	2060/61	2003/04	93.5	97.7	85.4	85.8	77.3	90.2
Coverage	2061/62	2004/05	87.9	87.1	81.0	77.2	73.4	83.0
	2062/63	2005/06	94.5	96.1	84.4	91.1	84.5	91.9
	2059/60	2002/03	80.9	86.3	74.4	77.2	75.5	80.2
Measles (<1 year)	2060/61	2003/04	87.7	89.9	81.5	84.5	76.4	85.4
Coverage	2061/62	2004/05	84.4	81.2	77.4	76.3	71.2	79.3
	2062/63	2005/06	89.6	91.1	80.0	88.9	81.1	87.5
TT2 Coverage	2059/60	2002/03	35.5	29.5	29.7	25.6	25.9	30.0
(Pregnant women)	2060/61	2003/04	45.8	44.2	40.0	36.8	39.9	42.3
	2061/62	2004/05	50.9	45.0	43.1	41.0	39.1	44.9
	2062/63	2005/06	56.4	49.4	49.2	52.3	48.1	51.3

Source: HMIS/MD, DoHS

Drop Out Rates

Drop out rates are gradually decreasing over the years as shown below.

Figure No 4.2 Drop out Rate



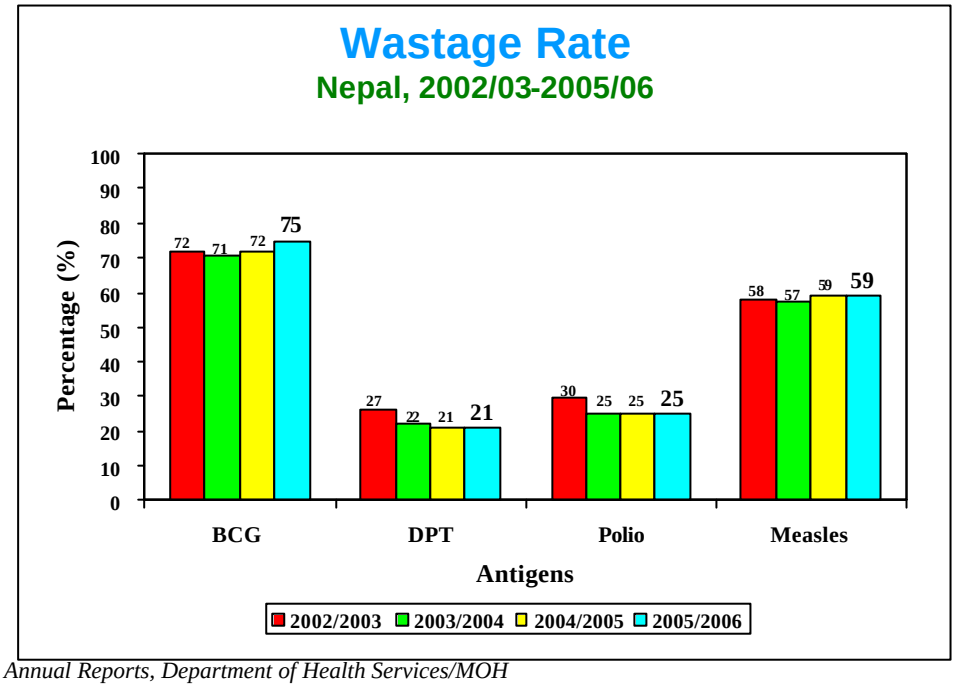
Source: Annual Reports, Department of Health Services/MOH

Gap**:** Drop out at lowest possible level.

Vaccine Wastage

Despite various initiatives, the wastage rates of BCG and Measles are still high; DPT and OPV are still above targeted acceptable level.

Figure No 4.3 Vaccine Wastage



Source: Annual Reports, Department of Health Services/MOH

Gap: T-series vaccine wastage should be minimum level possible.

Vaccine management

Vaccine and logistics procurement: Vaccine and logistics needs are forecast at the national level by the immunization section based on the projected target population, wastage rate and targeted coverage rate. For lyophilized vaccines, forecasting is done on the basis of the number of EPI session to be conducted each month.

Currently, the government of Nepal fully funds the purchase of traditional vaccines (BCG, DPT, TT, oral polio and measles) and the related logistics for routine immunization. The Global Alliance for Vaccines and Immunization (GAVI) has started supporting the tetravalent DPT-HepB vaccine in the form of a commodity grant. A portion of the cost of OPVs used at polio SIAs is provided by the Japanese International Cooperation Agency (JICA) and UNICEF. At the time of government financial shortfalls

for vaccine and logistics, WHO, AusAID and USAID has also supported the National Immunization Program by providing vaccine and related logistics.

Procurement of vaccines and logistics takes place centrally through the Logistic Management Division of DoHS. Competitive bidding for the procurement of vaccine takes place once a year, usually in July. It is time consuming and usually delayed.

Gaps:
- Adequate and timely forecast and procurement of vaccines to avoid stock shortages/over-stock situations.
- Delay and lengthy processing of bidding has influenced vaccine reception in time.
- There was a stock shortage of DPT3 and BCG for about 3 months in 2005.

Quality: All vaccines used in Nepal are in line with the basic quality standards established by the World Health Organization (WHO). The Department of Drug Administration is the national control authority responsible for monitoring the quality of purchased vaccines.

The national policy is that all vaccines used in Nepal must be with vaccine-vial monitors (VVM). Nepal has implemented the use of AD syringes and safety boxes in all immunization activities.

Inventory: The National Immunization Program (NIP) monitors the distribution, storage and transport of vaccines and immunization logistics. While the actual management of these systems is undertaken by the Cold Chain Section under the Logistics Management Division (LMD), the NIP advises the LMD about vaccine needs and their technical requirements. The Logistic Management Information System is in place to give information on available vaccines, cold chain equipment and syringes to guide the NIP; however, the information is always inconsistent and is not useful for immediate action, as the information is available only every 3-4 months.

Gaps:
- The existing Logistics Management Information System needs to be strengthened to ensure that CHD receives accurate and timely up-to-date information on the quantity of vaccines in stock and the status of cold chain equipment.
- Monthly logistics reports would ensure that sufficient supplies are available for routine and supplemental immunization and that equipment is in good-operating conditions.

Vaccine storage: When vaccines arrive in Nepal, they are stored at a central store under optimum temperatures. From the central store they are distributed to six Regional Cold Stores and from there to the country's 75 district cold stores. The existing policy is to store vaccines at the central level for six months, at regional medical stores for four months and at districts stores for one to two months. As vaccines are temperature-sensitive, a cold chain system is maintained during storage and transportation.

With the support of the government of Japan, cold chain capacity has been expanded to match the national need. The existing cold chain capacity for routine immunizations currently seems adequate; however there is some limitation of storage during mass campaigns. The present system of cold chain inventory and expiration date monitoring is incomplete and not regularly updated; proper inventory records and regular maintenance and timely replacement are very crucial to the quality of the cold chain system.

Storage of syringes, icepack, cold boxes, vaccine carriers and safety boxes is usually inadequate at the district and sub-district levels causing damage and lose of immunization logistics, although the vaccine is stored in a cold room/defined area. This has lead to confusion while implementing the program.

Table no 4.4: Existing Cold Chain Capacity

Central cold room	Regional cold rooms	District cold room	Remarks
1. Walk in freezer – 34 cu meter 2. Walk in cooler- 19.9 cu m 3. Walk in cooler 18 cu. m 4. Walk in cooler – 30 cu .m	1. Birat Nagar Walk in coolers 9.1 cu m – old and 15 cu .m 2. Nepalganj (9.4 cu m-old and 15 cu m 3. Dhangadhi (9 cu.m –old and 15 cu m 4. Pokhara – 8.86 cu m- old 5. Hetauda – 9.1 cu.m –old. 6. Butwal –15 cu m 7. Pathlaiya – 15 cu m	All 75 districts have 600 to 800 litres cold chain capacity depending on the size of population	Each cold room contains cold boxes, ice-packs, and vaccine carriers to transport vaccines

An irregular electricity supply is a continuous threat to maintaining the cold chain system in most of the cold room. In times of interrupted electricity, many districts lack adequate back-up systems such as a functioning generator and an adequate stock of kerosene. Since government allocations for electricity are not sufficient to run cold rooms throughout the year, many regional stores and districts have pending electricity bills.

In districts where the cold room freezers are run by kerosene, the budget allocated for kerosene is not enough for the whole year as the price of kerosene has increase more than three times in the last three years. The government budget for kerosene has only increased marginally. Kerosene prices are still higher in remote districts and sub-centers due to high transportation costs.

Gaps**:**

- Expansions and replacement plans need to address current and future cold storage capacity along with appropriate equipment for remote location
- Qualified cold chain assistants and refrigeration technicians are needed to ensure that equipment is maintained at optimum levels to keep vaccines at the correct temperature.
- Insufficient government funding for kerosene and electricity.
- Local governments are not involved in maintaining fuel for refrigerators.

Solar freezers: There are ten solar freezers within the country for the feasibility study, which are functioning well except for regular, skilled maintenance. Use of solar/hybrid energy systems to run freezers will be the most sustainable and cost effective way of maintaining the cold chain if regular maintenance and minor repairs can be insured.

Vaccine distribution system: Although there is a vaccine distribution plan in place, many times the cold rooms do not follow the plan developed. Most of the time, there is inconsistency in the demand for vaccines from the districts leading to mismatches of vaccine distribution with surplus vaccines in some districts and shortages in others. Vaccine distribution and supply must be bundled with other related logistics like diluents, syringes, and safety boxes. The supply and distribution systems are not well coordinated.

Gaps:

- There is no bundling of vaccine and immunization related logistics.
- A two-way system of supply and distribution needs to be implemented.

Preventive maintenance and replacement plan for cold chain equipment: For the last three decades, maintenance of the cold chain system has been done at the time of crisis. There is a lack of preventive maintenance/replacement plans for cold chain equipment. There are posts for refrigerator technicians at central and regional medical stores and for cold chain assistants at district levels; however, trained maintenance staff is under utilized, and some do not have updated skills.

Cold chain equipment including different types of freezers, cold boxes, vaccine carriers, and icepacks and wicks are supplied from the central level. In the year 2005, the government of Japan provided new cold chain equipment as a commodity grant, and almost all the cold rooms in the country now have new equipment. After regularly scheduled inventories, old and non-functioning equipment should be replaced as needed.

Gaps:

- Preventive maintenance plan at each level.
- Regular training for preventive maintenance of cold chain equipment.
- Cold chain replacement plan for each level.
- Regular supporting supervisory visits.

Contingency plan: A contingency plan for vaccine and cold chain equipment does not exist at the district level. A plan should be developed to respond to emergencies; its absence leads to crises at the central and at the district level in managing supplementary as well as routine immunization.

Vaccine wastage: Vaccine wastage, the portion of vaccine that is supplied but not administered, is somewhat predictable and acceptable. Recent figures show Nepal's wastage rates vary from about 20 percent for DPT vaccines to 72 percent for BCG vaccines. Nepal's target is to reduce wastage to less than 15 percent for OPV, DPT-HepB, and TT. For reconstituted vaccines (such as BCG and measles) the wastage target is about 50 percent.

Gaps:
- A multi-dose vial policy is in place and it needs to be followed to decrease wastage.
- Vaccine wastage rates have to be separately monitors at storage level and service delivery level.

Injection safety and waste disposal

Injection safety: The MoH&P has an injection safety policy. Auto-disable syringes (ADS) are used for all injectable antigens in routine immunization and SIAs.

Gap:
Operational guidelines and vaccinator refresher training will improve injection safety.

Waste disposal: Used syringes and needles are collected in safety boxes. While some sites dispose of waste through incineration, disposal primarily is through open-pit burning and burying.

Gap:
Additional waste disposal methods need to be explored. The incineration method needs to be expanded into all health facilities.

Adverse events following immunization (AEFI): The AEFI surveillance system started in 2004 with 31 sentinel sites. Expansion of sentinel sites by 20 is planned for 2006. AEFI field guides were developed and plans are in place to establish sentinel sites in all 75 districts. Overall, the quality of immunization services is satisfactory. However, there is no functional AEFI reporting system.

Gap:
As new vaccines are added to the immunization program, it is vital that a well-functioning AEFI system be incorporated into the HMIS reporting system.

Behavior Change Communication (BCC), Social Mobilization, and Advocacy

BCC is a very important aspect of the immunization program for the creation of service demand in the community and in families. Currently the NIP gets support from NHEICC for the BCC's activities, i.e. production of IEC materials, leaflets, brochures, posters and use of electronic media (radio, TV, FMs). In addition, the IPC is a major component in motivating the parents. Health workers and female community health volunteers interact with the parents and women to discuss the immunization program.

District health offices also carry out various activities such as rallies and demonstration campaigns that involve other line officers, NGOs, CBOs, and local human resources. In the School Immunization Activities local teachers and DWO are also actively involved.

Gap:

- Different messages are needed for different audiences. For example,
  - messages for health workers might focus on job aids,
  - messages for community leaders might focus on gaining the involvement of a broad range of groups,
  - messages for mothers might provide information about the importance of immunization and about routine immunization schedules.
- As international and local non-governmental agencies also produce and disseminate health messages, coordination among all agencies is vital.
- Messages need originality and variety to captivate and maintain audience interest.
- New mothers need to be made aware of the benefits of immunization.
- Promises for new services including use of new vaccines and safety immunizations are often not fulfilled.

Reporting

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 unimmunized 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 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.

Introduction of new vaccines and research

A Japanese encephalitis vaccination in campaign and routine in endemic districts is already planned. Other new vaccines that may be considered for introduction in Nepal include Hib, MMR/MR and possibly rotavirus and pneumococcal vaccines. Surveillance for the above-mentioned diseases and availability of accurate information on the disease burden of VPDs will be a prerequisite for decision-making. Surveillance for Hib, rubella and pneumococcal disease has already been initiated. There is need for more disease burden studies to quantify problems so that policymakers can make informed decisions about the introduction of new vaccines.

Health system weakness affecting immunization

- 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). As there is no established health structure for preventive and promotional health and no FCHVs in municipal areas, there is inadequate access to the urban poor to immunization and to other preventive and promotional services.

- 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.

- 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.

- 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.

- 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.)

- 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 lead to poor motivation for quality supportive supervision. Transportation cost allocated by the government is not adequate.

- Present literacy rates, especially among women, and awareness of health and healthy practices are low.

- 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.

Chapter 5

Goal, Objectives and Milestones

Goal

To reduce child morbidity, mortality and disability associated with vaccine-preventable diseases.

Objectives

The objectives of the NIP are to:

1. Achieve and sustain 90 percent coverage of DPT3 by 2008 and all antigens by 2010.
2. Maintain polio free status.
3. Sustain MNT elimination status.
4. Initiate measles elimination.
5. Expand VPDs surveillance.
6. Accelerate control of other vaccine-preventable diseases through introduction of new vaccines.
7. Improve and sustain immunization quality.
8. Expand immunization services beyond infancy.

Milestones

Table No 5.1: Milestones

Objectives	2007	2008	2009	2010	2011
Objective 1: Achieve and sustain 90% coverage: DPT3 by 2008. All antigens by 2010	***For DPT3*** • 90% coverage in 50 districts. *For all antigens:* • 90% in 20 additional • 80-90% in 50 districts, and • 60-80% in 5 districts • 85% in all VDCs and municipalities in these 30 districts	***For DPT3*** • 90% in 75 Districts • For all antigens: • 90% in 20 more districts (total 40 districts) • 85% in all VDCs and municipalities in these 20 districts	***For DPT3*** • >90% in 75 Districts • For all antigens: • 90% in 15 more districts (total 55 districts) • 85% in all VDCs and municipalities in these 15 districts	***For DPT3*** • >90% in 75 Districts • For all antigens: • 90% in 10 more districts (total 65 districts) • 85% in all VDCs and municipalities in these 10 districts	***For DPT3*** • > 90% in 75 Districts • For all antigens: • 90% in 10 more districts (total 75 districts) • At least 85% in all VDCs and municipalities in the all districts
Objective 2: Maintain Polio free status	No wild polio cases	Eradicate Poliomyelitis			
Objective 3: Sustain MNT elimination status	Sustain elimination status				

Objectives		2007	2008	2009	2010	2011
Objective 4: Initiate Measles elimination		90% in 80 percent of districts	90% in 90% of districts	>90% mortality reduction compare to 2003	Initiative Measles Elimination	
Objective 5: Expand VPDs surveillance		Continue with the Integrated VPD surveillance of AFP, Measles, NT, JE. Diseases burden study of Rubella, CRS and Haemophilus influenza B				
Objective 6: Accelerate control of other vaccine preventable diseases	MR	Continue with diseases burden study		75 districts		
	JE	24 Districts				
	Hib (DPT-HepB-Hib)	Continue with diseases burden study		75 districts		
Objective 7: Improve and sustain immunization quality		- Continue with AD syringes in routine immunization - Safe disposal of immunization waste - Using safety boxes - Promote low cost incinerator in each health facilities and bigger incinerator in big municipality				
Objective 8: Expand immunization services beyond infancy		JE Campaign 18 districts School Immunization in 24 districts	JE Campaign 3 endemic School Immunization in 48 districts	School Immunization in 75 districts		

Performance indicators

- Percentage of districts with coverage rates for all antigens.
- Percentage of VDCs with coverage rates for DPT3 and measles.
- Percentage of districts with drop-out rates less than 10 percent for BCG-minus-measles immunization and DPT1-minus-DPT 3.
- Reported numbers of stock-outages at districts level.
- Number of indigenous wild poliovirus cases.
- Number of AFP cases with collected stool specimens greater than 80 percent.
- Percentage of TT2+ coverage for pregnant women.
- Number of NT cases reported.
- Number and percentage of measles cases and related deaths.
- Number and percentage of districts with new vaccine introduction in routine immunization program (JE, School Immunization, MR, Hib).
- Percentage of districts having integrated expanded VPDs surveillance for the Hib, Rubella and CRS.
- Percentage of children vaccinated with TT in school immunization program (grades 1, 2, and 3).
- Number of districts with micro planning.
- Number of districts with stock-out of vaccine.
- Number of districts with adequate functioning cold chain system.

- Number of districts with stock-out of AD syringes.
- Number of districts with regular reporting system of AEFI.
- Percentage of vaccinators vacant at district level.
- Number of health facilities having low cost incinerators and number of municipalities with high-tech incinerators.
- Number of supervision visits conducted as per plan.

Chapter 6

Strategies and Key Activities 2007-2011

Table No 6.1 Strategies and Key Activities 2007-2011

Objectives	Components	Strategies	Key Activities	Time Lines					Remarks
				2007	2008	2009	2010	2011	
Achieve and sustain 90% coverage: DPT3 by 2008.All antigens by 2010	**4A. Service Delivery**	Strengthen routine immunization through RED strategies	Conduct micro planning workshops in all districts, phase-wise for strengthening immunization services specially focusing on un-reached population	15	30	30			
			Initiate enumeration of target population						
			Provide Complete Immunization Certificate						
		Monitor quality of immunization services	Review coverage of municipalities two times a year						
			Conduct performance review meetings: • Central Level – once a year • Regional Level – twice a year • District Level – two times a year • Health Facility Level – monthly • Categorize, prioritize and take corrective action in low performing and hard to reach areas • Provide monitoring feedback to Health Facility and community levels						
			Conduct supportive supervision and monitoring for: • A minimum two supervisory visits a year from central office to regions • At least three supervisory visits a year from the regional headquarters to the districts • At least one supervisory visit from district headquarters to all VDCs, and at least two to low-performing VDCs each year • Use of Immunization Monitoring Chart at all level • Cold chain equipment maintenance by refrigerator technician and cold chain assistant						

Objectives	Components	Strategies	Key Activities	Time Lines					Remarks
				2007	2008	2009	2010	2011	
	4.B Advocacy and Communication	Intensify social mobilization activities	• Strengthen Social Mobilization Activities • Support Immunization Committees at District and VDC levels • Develop district-specific social mobilization strategies and implement them • Widely use both electronic & printed communications and advocacy materials • Collaborate with NIP partners in social mobilization activities • Design and develop interpersonal communication materials for wide-range of audiences • Conduct NIP Week						
		Build partnership for sustainable financing	Expand partnership through: • Joint annual planning and periodic review with major partners including ICC • Conduct briefing meeting with higher authorities • Collaborate with local government and CBOs/NGOs						
			Advocate for sustainable financing: • Lobbying to increase national budget allocation for immunization • Obtain Local Government's commitment for local resource mobilization (especially for fuel and vaccine transport) • Review and update sustainable financing plan with partners						
	Surveillance	Initiate surveillance of additional VPDs	Surveillance of Diphtheria and Pertussis (with AFP Surveillance)						
			Continue surveillance of Polio, Measles, NT, JE						
	4.D Vaccine supply, Quality and Logistic	Improve vaccine management system	Reactivate Vaccine Management Sub-committee (Comprising of CHD, LMD, DDA and NIP partners)						

Objectives	Components	Strategies	Key Activities	Time Lines					Remarks
				2007	2008	2009	2010	2011	
			Update vaccine management system: • Assess vaccine management system • Revise the policy for forecasting, procuring, storing, and distributing vaccines and related logistics • Maintain regular and timely supply of vaccines and related supplies • Updating inventory of vaccine, cold chain equipments and immunization logistics (at all levels)						
Achieve and sustain 90% coverage: DPT3 by 2008. All antigens by 2010			Develop periodic replacement plan for: • Cold Chain equipments/spare parts • Repair and maintenance of cold chain equipment						
			Procure: • A refrigerator van to transport vaccines • Generators for cold chain equipments • Cold Chain tool kits for new sub-centers • Solar/hybrid energy equipment for cold chain sub-centers						
		Initiate MDVP up to PHC and health posts with freezers Ensure safe vaccine storage	Implement a multi-dose vaccine vial policy Develop infrastructure for safe vaccine storage in remote areas						
	4E. Program Management	Ensure availability of immunization resource materials at health facility level	Develop/Update, Print and Distribute: • Micro-planning guidelines • Immunization field Guide • Case management of VPDs • Vaccinators Diary • Program review guidelines including forms & formats • School based immunization program • Guidelines on introduction of MMR/MR • Guidelines on introduction of Hib • Guidelines on introduction of JE • Guidelines on Lab diagnosis of VPDs						

Objectives	Components	Strategies	Key Activities	Time Lines					Remarks
				2007	2008	2009	2010	2011	
			• Guidelines on vaccine management • Safe Injection and waste disposal • Guidelines on surveillance of Diphtheria, Pertussis, JE, Hib and Rubella						
Achieve and sustain 90% coverage: DPT3 by 2008. All antigens by 2010	**4E. Program Management**	Increase knowledge and skill of health workers	Conduct Training: • MtoT • MLM • NIP Refresher every five years • Repair and maintenance of cold chain equipment • Collaboration with Bio-medical institute • Data analysis for supervisors and statistical assistants DQS/DQSA • Case Management of VPDs • Laboratory Staff on diagnosis of VPDs • Basic Immunization Training for new vaccinators • Job Aid for Health Workers • Health staff on AEFI surveillance	2007 2007 2007 2007 2007 2007 2007 2007 2007 2007	2008 2008 2008 2008 2008 2008 2008 2008 2008	2009 2009 2009 2009 2009 2008 2009 2009 2008	2010 2010 2010 2010 2010 2010 2010	2011 2011 2011 2011 2011 2011 2011 2011 2011 2011	
		Develop and updates strategies	Printing of policy and strategies on: a) National Immunization Program b) School Immunization Program c) Measles Second Opportunity (Follow-up Campaign) d) New and underused vaccine (MR/MMR, JE, Hib, Rubella, Pneumococcal) e) Lab procedures f) Municipality Immunization Service	2007 2008 2007 2007 2007	2008				
			Conduct National Immunization survey						

Objectives	Components	Strategies	Key Activities	Time Lines					Remarks
				2007	2008	2009	2010	2011	
		Human Resource Development	Obtain services of a) Refrigerator technicians *Contract out* a) Five Immunization Officers b) One Computer Assistant c) Two Supporting Staff (Peon, Driver etc) d) One Lab Technical Staff e) One Logistician						
		Strengthen immunization monitoring system both quantitative and qualitative	Collect and analyze immunization data for action: 1. VDCs at districts level 2. District at central level						
Maintain Polio free status	**4A. Service Delivery**	Ensure polio eradication strategies implemented	Provide 3 doses of OPV to all children by the age of 12 months through RI						
			Conduct supplemental immunization activities as needed						
			Convene periodic meetings of the National Certification Committee (NCC), Expert Review Committee (ERC) and Lab Contentment Task Force						
	4B. Advocacy and Communication	Maintain high level of awareness	Develop social mobilization plan for SIAs (NID, SNID, Mop-up, Cross Border Polio SIAs)						
	4C. Surveillance	Sustain WHO standard AFP Surveillance	Sustain high-quality AFP surveillance						
	4D. Vaccine supply, quality and logistics		Ensure timely supply of vaccine and logistics for routine and SIAs						
	4E. Program Management	Programme review	Carry out review of Polio Eradication Activities						

Objectives	Components	Strategies	Key Activities	Time Lines					Remarks
				2007	2008	2009	2010	2011	
Sustain MNT elimination status	**4A.Service Delivery**	Ensure high immunization coverage among pregnant women	Provide TT vaccines for all pregnant women during antenatal check-ups (PHC outreach)						
			Conduct risk-assessment for NT and provide TT vaccination						
	4B. Advocacy and Communication	Increase demand for TT	Develop BCC materials to increase demand for TT immunization						
	4C Surveillance	Initiate CB surveillance	Initiate community based surveillance for NT in phase wise manner						
	4D. Program Management	Develop MNTE validation TT vaccination policy	Implement post-validation TT vaccination policy						
		Promote safe delivery practice	Collaborate with the Family Health Division (FHD) to promote safe delivery practices						
Initiate Measles elimination	**4A.Service Delivery**	Sustain high immunization coverage with Measles vaccine	Provide measles vaccination to all children by the age of 12 months						
			Conduct Measles Follow-up Campaign						
			Conduct measles immunization response as appropriate to epidemiologic situation						
		Control Measles outbreaks	Conduct training on measles case management						
	4C. Surveillance	Investigate all measles like outbreaks	Track and investigate all measles-like outbreaks with serological confirmation (Measles and Rubella)						
Expand VPDs surveillance	**4A Service Delivery**	Sustain and expand quality surveillance	Study the disease burden of other VPDs (Hib, Rubella, Pheumo, Rota)						
	4C.Surveillance	Initiates surveillance of others VPDs	Include surveillance of other Vaccine Preventable Diseases (JE, Hib, Pneumococcal Pneumonia, Rotavirus)						

Objectives	Components	Strategies	Key Activities	Time Lines					Remarks
				2007	2008	2009	2010	2011	
			Train health staff on integrated surveillance activities						
	4E. Program Management	Initiate CRS study	Conduct a disease-burden study for Congenial Rubella Syndrome						
Accelerate control of other vaccine preventable diseases	**4A.Service Delivery**	Introduce new and underused vaccine	Introduce Rubella, MR, or MMR vaccine						
			Introduce Hib vaccine						
			Introduce JE vaccine : In routine immunization • Through campaign in endemic districts	2007 2007	2008	2009	2010	2011	
			Initiate Pneumococcal vaccine introduction						
		Initiate rubella immunization in child bearing age of women	Provide rubella vaccine to women of child bearing age						
	4C.Surveillance	Formulate surveillance guidelines	Develop materials to integrate surveillance of new diseases in coordination with EDCD eg EWARS						
	4E.Program Management	Strengthen lab based surveillance	Strengthen the ability of selected laboratories to test for new VPDs. • Training on Rota virus and Pneumococcal pneumonia detection • Procure and provide laboratory supplies and equipment for VPD surveillance						
Improve and sustain immunization quality	**4A.Service Delivery**	Improve quality of immunization	Integrate AEFI reporting into the HMIS reporting system						
			Procure safe injections equipments / items (AD syringes and safety boxes)						

Objectives	Components	Strategies	Key Activities	Time Lines					Remarks
				2007	2008	2009	2010	2011	
	4C.Surveillance	Improve monitoring of immunization quality	Carryout surveillance of AEFI (by developing, printing and distributing training materials and forms)						
	4D Vaccine Supply, Quality and Logistics	Ensure safe immunization practice	Initiate safe dispose of immunization waste (incinerator) through use of Incinerator in municipalities						
	4B. Advocacy and Communication	Develop strategy for integration of other health intervention	Combine immunization with other health interventions in the context of Health Sector Reform (HSR) Continue technical support of NIP partners including human resources						
	4E. Program Management	Sharing of knowledge, skills and experience on immunization	Provide learning opportunities to immunization related health workers through study abroad						
			Support for developing "model districts" for enhancing skills of health workers from other districts						
		Ensure quality data	Conduct DQSA in both high- and low-performing VDCs and utilize the information for further improvement.						
			Facilitate HMIS to include VDC level data collection at districts level.						
Expand immunization services beyond infancy	**4A. Service Delivery**	Expand School Immunization with Diphtheria and Measles Vaccine	Provide dT vaccine in all 75 districts through School Immunization Program						
			Initiate Second Opportunity for School Children with Measles Vaccination through School Immunization						
	4B. Communication and Advocacy	Strengthen communication	Continue mass media communications activities						
			Mobilize advocacy for immunization through school children and teachers						
	4E.Program Management	Strengthening of districts health office	Procure and supply computers and maintain them in operational condition in the districts for effective MIS						

Chapter 7

Future Resource Requirements and Program Financing, Gap Analysis

This section projects future costs (based on assumptions about the input required) and estimates and analyses the gap between future resource requirements and available financing.

The cMYP examines the current status of funding for the NIP and projects the future need. As mentioned earlier, the baseline scenario is for the year 2005. The future projections are done for five years, 2007-2011.

Currently the NIP focuses on seven primary series antigens: BCG, DPT-HepB, OPV, Measles for under one year old children and TT for women and school-going children in grades 1, 2, and 3. Tetravalent (DPT-Hep B) was introduced in Feburary/March 2006 in routine immunization in all 75 districts with the support of GAVI, and the vision is to replace tetravalent by pentavalent (DPT- Hep B-HiB) vaccines from 2009. For school children, TT was introduced in a phased manner from 2005, for grades 1-3 and will cover the entire country in the coming years.

JE vaccination was started in four endemic districts as a mass campaign to all population from one year of age and above, in two districts from one year up to 14 years of age and will be continued in 18 endemic districts as a campaign; that will be followed by the introduction of JE vaccination in 24 districts in routine immunizations in 2007. Additionally, MR will be started in 2009 after assessing the burden of congenital Rubella syndrome. There was a measles campaign in 2005, in addition to the on-going polio campaign. In 2008, there is a plan to have another measles follow-up campaign.

Before turning to the costing and financing results, it is important to mention the various partners of the government of Nepal in immunization activities.

Historically, the main multilateral agencies active in the NIP are UNICEF and WHO. The World Bank also has a significant presence in Nepal by way of IDA loans. The bilateral external development partners are JICA, USAID, DFID, GTZ, and Rotary International. In addition, various NGOs and INGOs are also supporting immunization program activities at the district level. At present over 90 percent of EDP funds for health go directly to the MoH or are self-executed by partners; the government has mandated that all the funds should be routed through the MoH, so this proportion is likely to increase even further. The Interagency Coordinating Committee (ICC) for NIP has been operational since 2001. Altogether nine External Development Partners (EDP) are included in the ICC and participate in the regular ICC meetings.

The ICC has regular meetings, chaired by the Director General of Health Services. The Nepal Development Forum (NDF) is another forum for donors/developmental partners. Support is mostly organized in project/program form, in some cases by several donors

jointly. As part of its commitment, the World Bank has contributed to the pooled funding under a Sector-Wide Approach (SWAP) for a period of five years (2005-2009), and DFID has agreed to join this SWAP. The JICA has supported refurbishing the cold chain system and also provided polio vaccines for the polio campaign in the past. Currently, all the donors are involved in joint reviews of the annual health sector performance and developing annual joint plans of action.

As long-term partners, WHO, UNICEF and JICA will continue to support the NIP. GAVI is expected to continue its support with underused and new vaccines since Nepal has achieved the commitments expressed in the first phase.

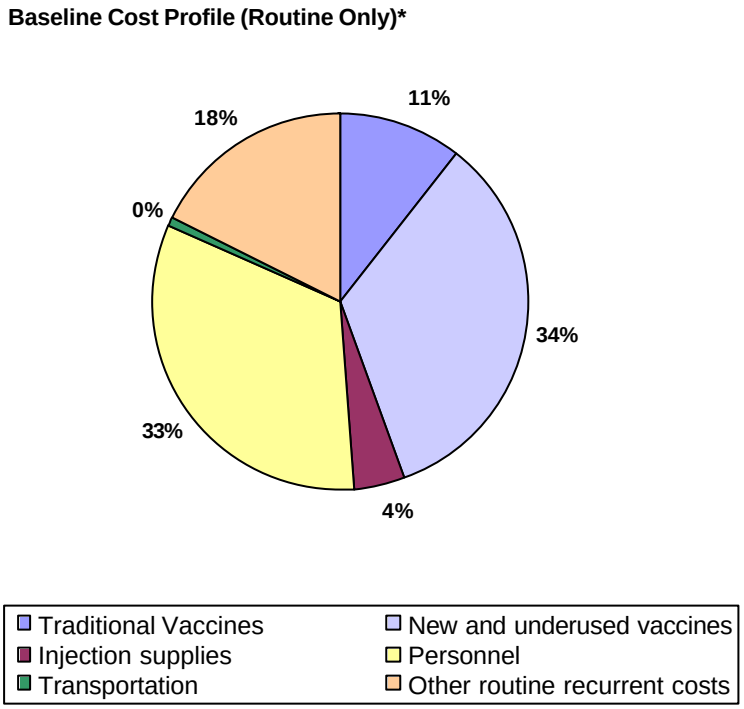
Baseline cost scenario

Costing of baseline as well as projections are undertaken using the cMYP tool after taking into account the cost of salaries, allowances, campaigns and program goals with proposed new and underused vaccine introductions. The overall cost in 2005 was $25,106,173 of which 36 percent was for routine immunization and about 33 percent for campaigns. Campaigns conducted in 2005 were the measles campaign together with the single dose polio campaign. The rest of the costs were for shared activities within the government. If one considers only immunization expenditures leaving out shared costs, the cost per capita is about $0.4, and the cost per DTP3 per child was about $14.9 in 2005. The table below presents the baseline indicators for 2005.

Table No 7.1 Baseline Indicators

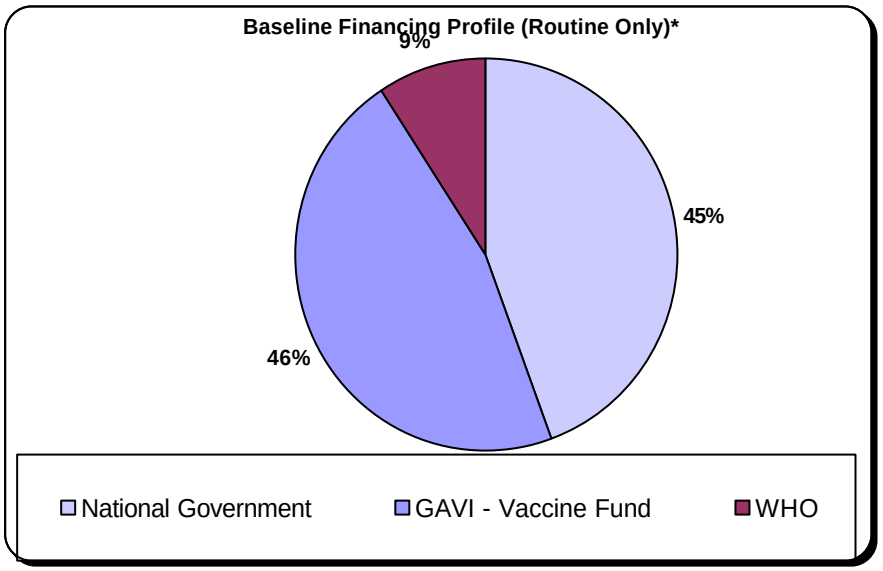
Baseline Indicators	2005
Total Immunization Expenditures	$17,302,581
Campaigns	$8,285,156
Routine Immunization only	$9,017,425
per capita	$0.4
per DTP3 child	$14.9
% Vaccines and supplies	48.5%
% National funding	42.7%
% Total health expenditures	1.2%
% Gov. health expenditures	8.7%
% GDP	0.11%
Total Shared Costs	$7,803,593
% Shared health systems cost	31%
TOTAL	$25,106,173

Graph 7.1 Baseline Cost Profile (Routine Only)



The pie chart presented above breaks down the total cost by items: as can be seen the bulk of the expenditure is for new vaccines (34%) and personnel costs (33%), followed by other routine recurrent costs (18%). Traditional vaccine costs were 11 percent of the total routine immunization costs.

What were the sources of financing of immunization expenditure in 2005? The following pie chart indicates the major sources.



Graph No 7.2 Base line financing profile (routine Only)

Currently, the GAVI vaccine fund remains the major contributor to immunization with 46 percent coverage, with an almost equal contribution from the government of Nepal (45%). WHO contributes the remaining 9 percent of the total expenditure.

Future resource requirements, financing and gaps

Based on the NIP objectives on traditional vaccines and new vaccines for the next five years, detailed costing was done using the cMYP tool. The table below gives the resource requirements, sources of funding, and the division of the funding sources between secure and probable funding. The graph shows the costs by strategy as well.

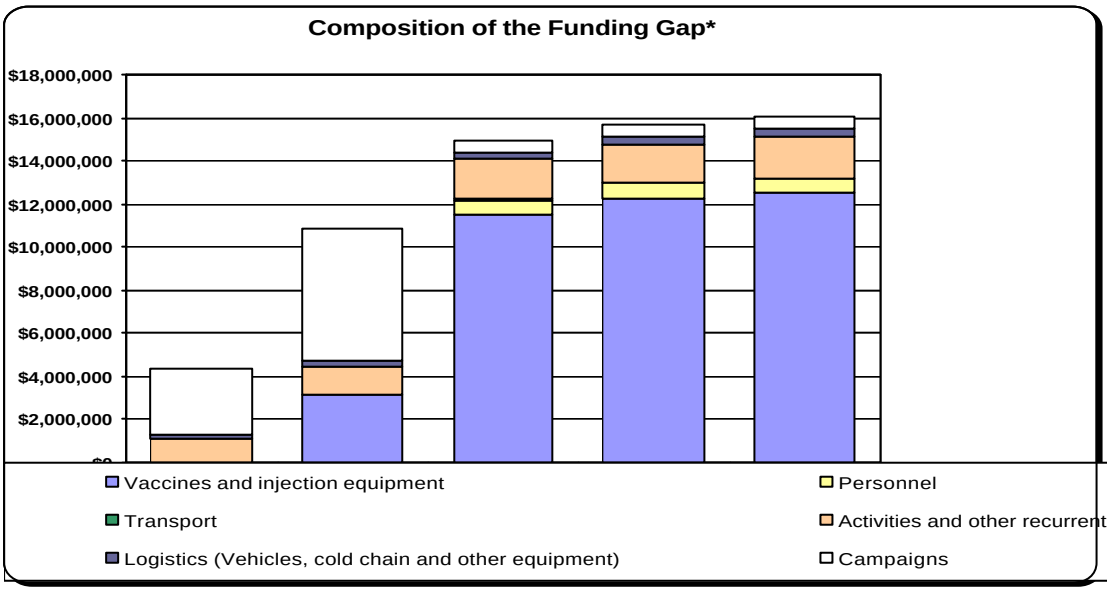
Table No 7.2 Future resource requirements, financing and gaps

Resource Requirements, Financing and Gaps*	2007	2008	2009	2010	2011
Total Resource Requirements	**$17,268,008**	**$19,234,673**	**$20,489,785**	**$20,916,041**	**$22,151,803**
Annual growth rate	0%	10%	6%	2%	6%
Total Resource Requirements (Routine only)	**$11,080,262**	**$12,655,299**	**$19,752,436**	**$20,152,070**	**$21,357,920**
per capita	$0.4	$0.5	$0.7	$0.7	$0.7
per DTP targeted child	$16.7	$17.9	$26.5	$25.4	$25.6
% Vaccines and supplies	46%	42%	65%	67%	68%
Total Secured Financing	**$12,949,632**	**$8,361,404**	**$5,515,306**	**$5,223,565**	**$6,091,300**
National Government	$4,017,252	$5,010,767	$5,515,306	$5,223,565	$6,091,300
Sub-national Gov.	$0	$0	$0	$0	$0
GAVI - Vaccine Fund	$4,086,945	$703,546	$0	$0	$0
WHO	$3,000	$0	$0	$0	$0
UNICEF	$155,946	$0	$0	$0	$0
JICA	$146,394	$844,689	$0	$0	$0
Pool Fund (DFID + World Bank)	$4,540,094	$1,802,402	$0	$0	$0
GAVI 2					
Funding Gap (with secured funds only)	**$4,318,376**	**$10,873,269**	**$14,974,478**	**$15,692,476**	**$16,060,503**
% of Total Needs	25%	57%	73%	75%	73%
Total Probable Financing	**$4,139,187**	**$10,637,492**	**$13,695,849**	**$14,270,738**	**$14,634,591**
National Government	$0	$0	$0	$0	$0
Sub-national Gov.	$0	$0	$0	$0	$0
GAVI - Vaccine Fund	$0	$0	$0	$0	$0
WHO	$2,824,091	$4,613,319	$1,399,716	$1,257,229	$1,389,871
UNICEF	$1,315,096	$2,859,468	$691,294	$716,001	$742,832
JICA	$0	$0	$0	$0	$0
Pool Fund (DFID + World Bank)	$0	$0	$0	$0	$0
GAVI 2	$0	$3,164,705	$11,604,838	$12,297,507	$12,501,889
Funding Gap (with secured & probable funds)	**$179,189**	**$235,777**	**$1,278,629**	**$1,421,738**	**$1,425,912**
% of Total Needs	1%	1%	6%	7%	6%

The following points emerge from the tables and the various graphs:

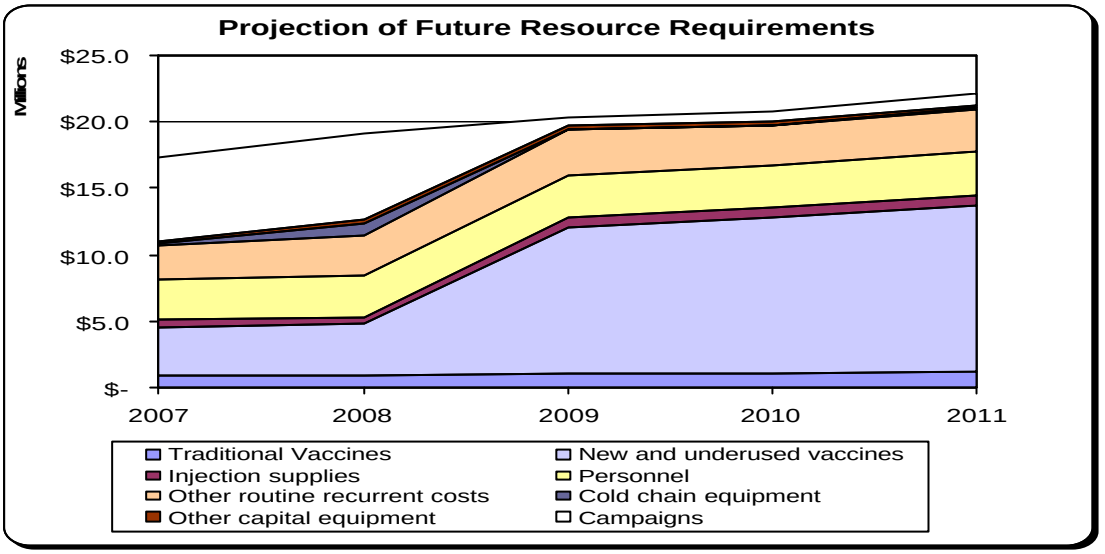
1. The total resource requirements increase steadily until 2009, decrease somewhat in 2010, and then show a modest increase of six percent in 2011. The largest rate of increase is in 2008, after which the growth in requirements slows due to the end of the polio and measles campaigns.
2. The per capita resource requirements increase until 2009, and then remains almost the same; the average for the five years is $0.6.

3. Routine outreach activities comprise the biggest source of costs, especially from 2009 onwards.
4. The secured funding sources are the government of Nepal, GAVI, pooled funds or SWAP money, and UNICEF & JICA to a certain extent. (Comment: WHO is a source of secure funding for 2007, for only US$3,000. This looks unlikely given that the other contribution is termed as 'probable'. Pl confirm)
5. Taking into account secured funds only, the funding gap as a percentage of total needs increases from 25 percent in 2007 to 73 percent in 2009, and then stabilizes at 72 percent in 2011. On an average, over the five years, the funding gap, based on secured resources, is 62 percent of total needs.
6. If both secure and probable sources are taken into account, the funding gap reduces to an average of five percent over the five years.
7. As the figures on the composition of the funding gap indicate, the main source of shortfalls is vaccines for 2009-2011, as expected.

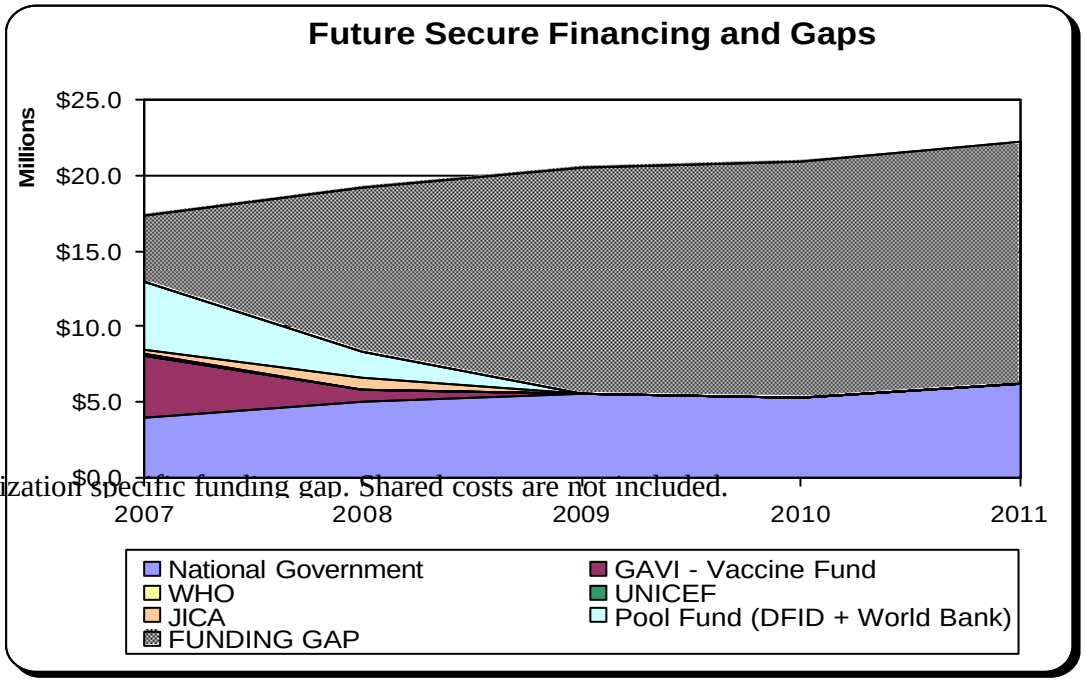


Graph No 7.3 Composition of the Funding Gap

The three following graphs indicate the projections for future resource requirements, future secure financing gaps and future secure plus probable financing gaps.

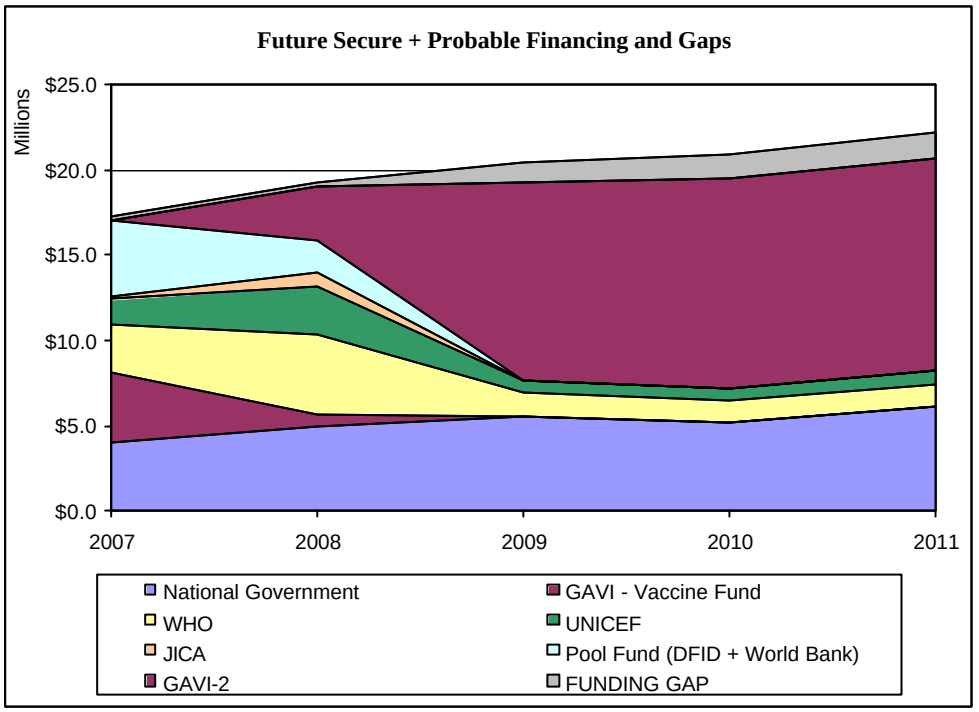


Graph No 7.4 Projection of Future Resource Requirements



Graph No 7.5 Future secure Financing and Gaps

* Immunization specific funding gap. Shared costs are not included.



Graph No 7.6 Future Secure + Probable Financing and Gaps

From the analysis it can be concluded that Nepal can sustain the program with traditional vaccines. However, external support will be extremely crucial in initiating new or underused vaccines (MR, JE, Pentavalent) and for conducting Supplemental Immunization Activities for polio eradication and measles mortality reduction. The overall size of the gap increases over time starting in 2009, as the contributions from other partners are no longer defined as probable and long-term projection and commitment is difficult to obtain. Also the cost of vaccines increases quite sharply post 2009 with the introduction of newer vaccines such as pentavalent vaccines (DPT- HepB-Hib), MR and JE). From the year 2009, vaccine costs become the largest component of the NIP expenditures, overtaking personnel costs and accounting for more than two-thirds of total immunization costs.

The options for dealing with these funding risks are: a) reviewing objectives and possibly reducing the speed in which improvements are introduced; b) accelerating the potential improvements in program efficiency; and c) exploring various additional funding sources such as development loans.

The analysis of the cost of immunization services undertaken suggests that the total cost is much beyond the official NIP budget. NHSP-IP has received budgetary support from the World Bank of $40 million in grants and $10 million in soft loan money from FY 2004/5 to 2008/9, fundamentally to deliver EHCS. DFID has already committed to HMG to provide a grant of $54 million for the same period for implementing NHSP-IP by a budgetary support modality under a pooled funding mechanism with HMG funds. These

two sources of funding under the SWAP mechanism have been a significant help to Nepal in its immunization activities.

The Eleventh Five Year development plan is expected to start in the year 2007/8 and MoH&P anticipates significant increases in the Health Sector allocation of seven percent, as agreed to by the concerned EDPS. The government also has a plan to increase per capita health expenditure (from about US$7 to $9 in a period of five years (2004-2008) as expressed in the Nepal Health Sector Program - Implementation Plan (NHSP- IP). The next major source of probable funding is UNICEF, followed by GAVI, JICA and WHO. The government is confident of continued support from WHO and UNICEF in the coming years. There is also a good possibility of continued support from the government of Japan in the area of cold chain strengthening. The government of Nepal expects continued support from GAVI for initiating new vaccines like MR and new and under used vaccines like Hib. If GAVI-II approves support for pentavalent (DPT+ Hib+ Hepatitis B) vaccines and MR, it will give ample opportunity for the sustainability of the program.

Although the analysis suggests some real risk to the financing of immunization services, part of the risk is simply due to the long length of the forward time commitment covered by the analysis. Nevertheless, the projected funding gap does suggest that there is a definite need to mobilize more funding for immunization services and to realize any efficiency gains that will lower costs. This is particularly so if the ambitious objectives in introducing newer vaccines are to be realized. Clearly, the government of Nepal will have to explore other possibilities from the various EDPs such as USAID, EU, AusAID and the government of India, etc. for future funding.

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5. Multi Year Plan of Action (2002-2007) – National Immunization Programme of Nepal
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14. Interim- Poverty Reduction Strategy Paper (I-PRSP)(2000)
15. Nepal Health Sector Implementation Plan (2004)
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17. Health Care Financing and Financial Management in Nepal (NHEA, 2002)
18. Public Health Facilities Efficiency Survey Report (NHEA, 2004)
19. Millennium Development Goals, Nepal: Progress Report, 2004.
20. WHO/UNICEF Joint Annual Report 2004/2005

Annex:

Table No 7.3 Situational analysis by accelerated disease control initiatives, based on previous years' data

Component	Suggested indicators	National* Achievement		
		2002/03	2003/04	2004/05
Polio	*OPV3 coverage*	84%	90%	83%
	Non polio AFP rate per 100,000 children under 15 yrs. of age	2	1.90	2.16
	Number of AFP Cases	197	192	213
	Extent: NID/SNID *No. of rounds* *Coverage range*	NIDs 2 rounds with 95-100% coverage, Mop-up 2rounds with >95% coverage	NIDs 2/r with 95-100% coverage	SNID 2 rounds with >90% coverage, Mop-up 2 rounds with >95% coverage
	Percentage of adequate stool collection	87%	86%	84%
	Number of wild Polio Cases	0	0	4
MNT	*TT2+ coverage of pregnant women*	30%	42%	45%
	Number of districts reporting > 1case per 1,000 live births	8 district	6 district	3 district
Measles	*Was there an SIA (Y/N) for MNTE*	Y	Y	N
	Measles coverage	80%	85%	79%
	No. of outbreaks reported	NA	NA	145

It is useful to include the data source (e.g. JRF/GAVI annual report etc.) for each data set.

Component	Suggested indicators	National* Achievement		
		2002/03	2003/04	2004/05
	Extent: SIAs for Measles Cohort (Age group Coverage)	NA	NA	National Measles Campaign 9 months - <15 years. >100% coverage
	Was a preventive campaign conducted (Y/N)	No	No	Yes
Japanese Encephalitis	*Number of AES Cases*		1,543	2,874
	Percentage of lab confirmed JE Cases		36%	34%

Table No 7.4: Situational analysis of routine EPI by system components based on previous years' data

System components	Suggested indicators	National*		
		2002/03	2003/04	2004/05
Routine Coverage	*Number of districts with >80% DPT3 coverage*	37/75	57/75	31/75
	Number of districts with <10% Dpt1 vs. DPT3 drop-out rate	62/75	66/75	53/75
	DTP3 coverage	86%	90%	80%
	% of districts with > 80% coverage	49%	76%	41%
	National DPT1-DPT3 drop out rate *Percentage of districts with drop out rate DTP1-DTP3>10*	5% 17%	5% 12%	7% 29%
New vaccines	*HepB3 coverage*	-	87%**	56%

* It is useful to include the data source (e.g. JRF/GAVI annual report etc.) for each data set. ** Partial districts covered, activity conducted lately in November hence the coverage of HepB3 is less in 2002/2003.

System components	Suggested indicators	National*		
		2002/03	2003/04	2004/05
Routine Surveillance	*% of surveillance reports received at national level from districts* HMIS (monthly report)	100%	100%	100%
	Active Surveillance Site (410) (Weekly report)	93%	93%	92%
Cold chain/Logistics	*Percentage of districts with adequate number of functional cold chain equipment*	100%	100%	100%
Immunization safety	*Percentage of districts supplied with adequate (equal or more) number of AD syringes for all routine immunizations*	NA	100%	100%
Vaccine supply	*Was there a stock-out at national level during last year?*	N	N	Y
	If yes, specify duration in months			BCG 2.5% & DPT 3.5%
Communication	*Availability of a plan*	Yes	Yes	Yes
Financial sustainability	*What percentage of total routine vaccine spending was financed using government funds? (including loans and excluding external public financing)*			
Linking to other health interventions	*Were immunization services systematically linked with delivery of other interventions (Malaria, Nutrition) established*	Yes	Yes	Yes
Human resources availability	*No. of vaccinators per 10,000 population (VHW/MCHW)*	3.5	3.5	3.5
Management planning	*Are a series of district indicators collected regularly at national level?(Y/N)*	Yes	Yes	Yes
NRA	*Number of functions conducted*	DDA	-	-

Research/studies	*Number of vaccine related studies conducted/being conducted*	Hib Study	JE burden, Measles Case Fatality	Hib Lab Surveillance, NT elimination validation study
ICC	Number of meetings held last year		5	3
Waste disposal	Availability of a waste management plan (Injection Safety)	Yes	Yes	Yes
Program Efficiency	Vaccine wastage monitoring at national level for all vaccines	Yes	Yes	Yes
	% of timeliness of disbursement of funds to district and service delivery level	66%	66%	66%

Gradual retirement of vaccinators is estimated (around 100 per year)

Studies and assessments:

Table No 7.5 Table showing Studies and Assessments:

• National EPI coverage survey (1998)
• Measles Case Fatality Study (2004)
• Hib Burden Study (2003)
• JE Burden Study (2004)
• NT Elimination validation study (2005)
• Annual performance report of Department of Health Services: (Annually)