

National Immunization Program

Reaching Every Child

Comprehensive Multi-Year Plan

2068-2072 (2011- 2016)



Child Health Division
Department of Health Services
Ministry of Health & Population
Kathmandu, Nepal
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Acronyms

ADS	Auto-disable Syringes
AEFI	Adverse Events Following Immunization
AFP	Acute Flaccid Paralysis
BCC	Behavior Change Communication
BCG	Bacille Calmette-Guerin
CB-IMCI	Community based – Integrated Management of Childhood Illness
CDR	Central Development Region
CHD	Child Health Division
CCA	Cold Chain Assistant
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
DQSA	Data Quality Self Assessment
EHCS	Essential Health Care Services
EDCD	Epidemiology and Disease Control Division
EDR	Eastern Development Region
EDP	External Development Partner
EPI	Expanded Programme on Immunization
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
GIVS	Global Immunization Vision and Strategy
Hep B	Hepatitis B
Hib	Haemophilus influenzae type b Vaccine
HMIS	Health Management Information System
HP	Health Post
HR	Human Resource
ICC	Interagency Coordination Committee
IHP	International Health Partnership
JE	Japanese Encephalitis
LMD	Logistics Management Division
MCH	Maternal & Child Health
MDG	Millennium Development Goal
MDV	Multi Dose Vial
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
NGO	Non-governmental Organization
NHEICC	National Health Education, Information and Communication Center
NHSP	National Health Sector Programme
NHSP-IP	National Health Sector Programme Implementation Plan
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
PHC	Primary Healthcare Center
PRSP	Poverty Reduction Strategy Papers
RHD	Regional Health Directorate
RED	Reach Every District
RT	Refrigerator Technician
SEAR	South East Asia Region
SHP	Sub Health Post
SIA	Supplemental Immunization Activity
Td	Tetanus Diphtheria Vaccine
TT	Tetanus Toxoid
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
VDC	Village Development Committee
VPD	Vaccine-Preventable Disease
WIC	Walk-in-Cooler
WIF	Walk-in-Freezer
WDR	Western Development Region
WPV	Wild Poliovirus
WHO	World Health Organization

Executive Summary

As per the Nepal's interim constitution 2006, health is considered as a right of the people. The Ministry of Health and Population (MOHP) in its Nepal National Health Sector Programme Implementation Plan (NHSP-II, 2010-2015) has a goal to improve the health and nutritional status of the Nepali population, especially for the poor and socially excluded. In the area of child health, it has a target to reduce under five mortality to a level of 38 and infant deaths to 32 per 1,000 live births by 2015 with several interventions including: sustaining community based integrated management of childhood illness (CB-IMCI), maintaining immunization coverage above 90% and scaling up community based newborn care.

The immunization program is one of the government's highest priority programs. The immunization program has helped in reducing the deaths of children and mothers from vaccine preventable diseases (VPDs) and has contributed in achieving Millennium Development Goals (MDG) 4 and 5. The Government through its policy documents has emphasized reaching poor and marginalized population with equitable services including immunization. Since the past decades new vaccines are available in the markets, and the Government is keen to provide all available means to reduce morbidity and mortality. In this regard it is essential to have a long term immunization plan with priority activities identified and as well as a financial sustainability plan.

The comprehensive multi-year plan 2011-2016 provides a plan for the next five years to achieve the immunization related goals expressed by the Government in various policy documents, the MDGs and WHAs resolutions and as well as different national and international forums. The plan also takes into consideration the Global Immunization Vision and Strategy (GIVS). The objectives, strategies and activities set forth in the plan provide the framework required to meet the goal of "reducing infant and child mortality and morbidity associated with vaccine-preventable diseases (VPDs)." Furthermore, this plan addresses new challenges and expands the previous plan by providing guidelines for the introduction of new vaccines, eradication, elimination and control of targeted VPDs and strengthening of routine immunization.

The multi-year plan has been developed with extensive discussion and participation of government, non-governmental organizations (NGOs) and partner agencies. The development of the plan started with identification of problems, constraints, key issues and national priorities. The plan sets goals, objectives, strategies, milestones, activities with timeline, indicators and associated costing and financial sustainability plan.

Goal, objectives, strategies and key activities (2011/12-2015/16)

The **goal** set for next five years is as follows:

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

The objectives, strategies and key activities are as follows:

Objective 1: Achieve and maintain at least 90% vaccination coverage for all antigens at national and district level by 2016

Proposed key strategies:

- Increase access to vaccination by implementing RED strategies in every district
- Enhance human resources capacity for immunization management
- Review program performance at all levels
- Strengthen communication, social mobilization, and advocacy activities
- Strengthen immunization data analysis, monitoring and use at all levels
- Strengthen immunization services in the municipalities
- Strengthen supportive supervision and monitoring activities
- Ensure adequate and sustainable financing for the immunization program

Objective 2: Ensure access to vaccines of assured quality and with appropriate waste management

Proposed key strategies:

- Strengthen the vaccine management system
- Strengthening cold chain systems at all levels
- Increase the capacity of cold chain staff
- Explore various methods of waste disposal

Objective 3: Achieve and maintain polio free status

The last case of indigenous wild poliovirus in Nepal was detected in 2000. However 4-6 cases of imported WPV has been detected each year in 2005-2008 and again in 2010 (Nepal was polio-free from 2001 to 2004 and 2009).

Proposed key strategies:

- Achieve and maintain immunity levels to stop transmission of poliomyelitis
- Respond adequately and timely to outbreak of poliomyelitis with appropriate vaccine
- Achieve and maintain certification standard AFP surveillance at district level
- Develop post eradication strategic guideline

Objective 4: Maintain maternal and neonatal tetanus elimination status

Nepal achieved MNT elimination status in 2005. The government is planning several activities to maintain MNT elimination status. The key strategies include:

- Achieve and maintain at least >80% TT2+ coverage for pregnant women in every districts
- Conduct Td follow up campaigns in high risk districts
- Expand school based immunization program
- Continue integrated VPD surveillance including NT

Objective 5: Achieve measles elimination status by 2016

Nepal has achieved the mortality reduction goal of decreasing measles deaths by >90% when compared to 2003 data. Nepal has taken further steps and has targeted measles for elimination by 2016. The key strategies include:

- Achieve and sustain immunity level to reduce measles incidence to elimination level
- Investigate all suspected measles outbreaks with program response
- Continue expansion of case-based measles surveillance

Objective 6: Accelerate control of vaccine-preventable diseases through introduction of new and underused vaccines

Key strategies:

- Introduction of new and under-used vaccines (rubella, pneumo, typhoid, rota) based on disease burden and financial sustainability in the country
- Expansion of cold chain capacity at all levels for introduction of new vaccines

Objective 7: Strengthen and expand VPD surveillance

Currently the integrated surveillance of VPDs targeted for eradication, elimination and control (AFP, measles, JE and NNT) is ongoing.

Key strategies:

- Expand VPD surveillance
- Strengthen staff capacity to accommodate additional laboratory surveillance procedures
- Control of JE, CRS/Rubella and other VPDs

Objective 8: Continue to expand immunization beyond infancy

Currently TT immunization has been provided to school children of grade one in 12 districts. The government plans to expand the school based immunization program to other districts and as well add new antigens including typhoid

Financial resource requirement and sustainability

The total resources required for the immunization program to conduct all the activities as per the cMYPA for the period 2011-15 is assumed to be USD \$ 123,724,659.00 (\$ 24.2 per DPT targeted child) excluding the shared system cost. However, with inclusion of the shared cost of the system, the cost per DPT targeted child would be around \$37.4, calculated using the cMYPA costing tool using a number of globally accepted assumptions. Major cost of the Immunization program is in the vaccines.

The Immunization system has a funding gap of 48% considering the secured funds only however with the inclusion of probable funding the gap narrows down to 21%. Most of the gaps are in the campaign activities and other recurrent costs. Almost all the secured funds for the program are from Government and from GAVI.

With introduction of newer vaccine the cost of immunization would significantly go high. So it is important to explore various ways of financial sustainability strategies including

- a) Increasing government fiscal space the immunization program will get increased share
- b) Accelerating the potential improvements in program efficiency
- c) Reviewing objectives and possibly reducing the speed in which improvements are planned for introduction
- d) Exploring various additional funding resources (domestic private and public as well as external partners)
- e) Establishment of Immunization Trust Fund as directed by the parliament

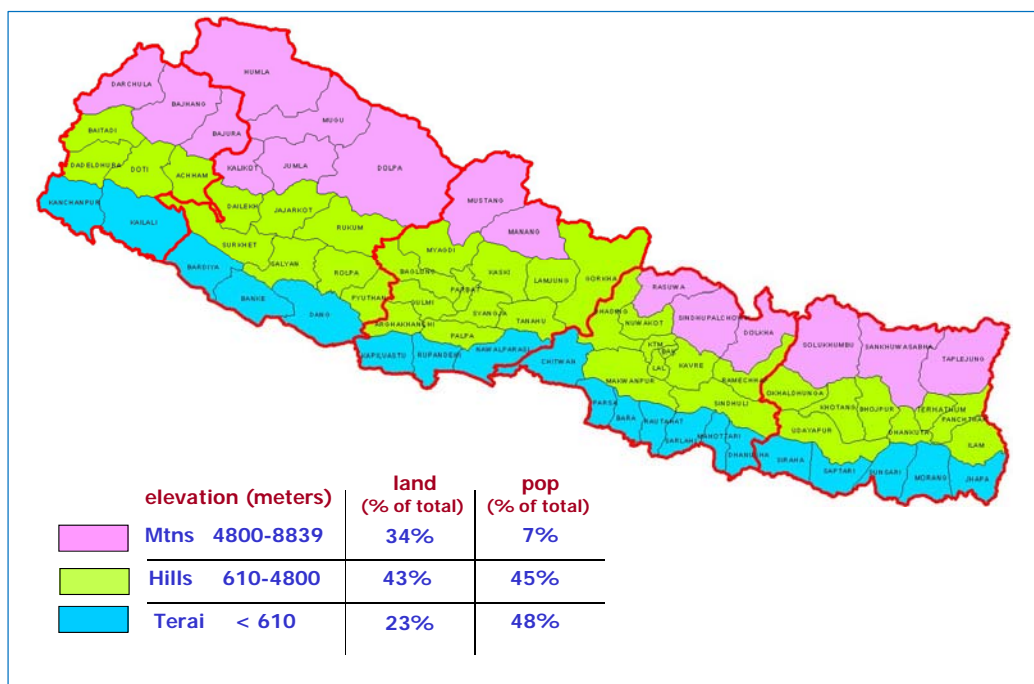
Chapter 1: Introduction

Country profile

Nepal is a landlocked country which shares its northern border with China and eastern, western and southern borders 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 flat (Terai) as described in the figure.

For administrative purposes, Nepal is divided into five development regions and 75 districts. Districts are further divided into 3,915 Village Development Committees (VDCs) and 58 municipalities.

Figure 1: Ecological zones and population distribution



Socio-Health Status

The Interim Constitution has established the right of all Nepali citizens to free basic health services, the right to a clean environment, access to education and a means of livelihood, in a social environment free of discrimination and institutionalized inequality.

Nepal has demonstrated significant progress in the last 10 years in achieving MDG targets in maternal and child health care despite of difficult topography, financial constraints, conflict and cultural /traditional barriers. All health indicators show steady gains and health status of the population has improved as shown below.

Table 1: Trends in key health indicators, target vs achievement

MDG Impact indicator	Achievement					Target	
	1991	1996	2001	2006	2009	2010-11	2015
Maternal mortality ratio	539	539	415	281	229		134
Total fertility ratio	5.3	4.6	4.1	3.1	2.9	3.0	2.5
Adolescent fertility rate(15-19 years)		127	110	98			70
CPR (Modern method)	24	26	35	44	45.1	48	67
Under 5 mortality rate	158	118.3	91	61	50	55	38
Infant mortality rate	106	78.5	64	48	41	44	32
Neonatal mortality rate		49.9	43	33	20	30	16
% of under weight children		49.2	48.3	38.6	39.7	34	29
HIV prevalence among age 15-49 years					0.49	0.39	0.30
TB case detection and success rates (%)		48 79	70 89	65 89	71 88	75 89	85 90
Malaria annual parasite incidence per 1000		0.54	0.40	0.28		Halt and reverse trend	

Data source: NHSP-II document

Major policies governing health system in Nepal are based on:

- Interim Constitution 2006
- National Health Policy -1991
- Second Long-Term Health Plan 1997-2017
- Local Self Governance Act 1999
- Health Sector Strategy: an Agenda for Action 2003/04
- Three-Year Interim Plan 2006-2009 & Free Health Care Policy- 2007/08
- Poverty Reduction Strategy Papers (PRSP) 2002-2007
- Nepal Health Development Partnership 2009 (IHP+ Nepal Compact Document)
- Nepal Health Sector Program Implementation Plan (NHSP-II) 2010-2015.

The health sector in Nepal for next five year (2010-2015) will be guided by NSHP-II. The goal of NHSP-II is to improve the health and nutritional status of the Nepali population, especially for the poor and excluded by increasing access to and utilization of quality essential health care services, reducing cultural and economic barriers to accessing health care services and harmful cultural practices in partnership with non-state actors and by improving the health system to achieve universal coverage of essential health services.

Health Care Delivery Services

Under the Ministry of Health and Population (MoHP) the basic health services is provided at 115 hospitals, 214 Primary Healthcare Centers (PHC), 679 Health Posts (HP) and 3,134 Sub Health Posts (SHP). Each Village Development Committee (VDC) has at least one health facility, which could be SHP or HP or PHC. There are approximately 15,000 mobile outreach clinics run by community health workers all over the country providing MCH services including immunization supported by Female Community Health Volunteers. In addition, 58 municipalities are also providing urban MCH services including immunization

Private sector: With rapid urbanization more people are migrating to urban areas. It is projected that by 2030, 60% of the population will live in urban areas. Due to limited availability of public health services, health care services in urban areas are mostly provided by the private sector.

Comprehensive Immunization Multi-Year plan (2011-2016)

Immunization has been identified as key component of the EHCS package in NHSP-II Implementation Plan. The NIP is guided by cMYP. Based on objectives of NSHP-II, the Comprehensive Multiyear Plan (cMYP) of the immunization program 2011-2016 has been developed, which supersedes the existing multi-year plan (2007-2011). It covers the Nepalese fiscal years 2068-2072. It provides the framework required to meet the stated goal of “reducing infant and child mortality and morbidity associated with vaccine-preventable diseases (VPDs).”

The cMYP 2011/12-2015/16 was developed after extensive consultation with districts and regions during review meetings. At national level various consultative workshops were held with partners and stakeholders to indentify issues, gaps and way forward.

Table 2: Status of target vs achievement of cMYP 2007-2011

SN	Objective	Status of achievement
1	Achieve and sustain 90% coverage of DPT3 by 2008 and all antigens by 2010	Not fully achieved (27% districts have > 90% DPT3 coverage and 23% districts have >90% coverage for all antigens in 2009/10)
2	Maintain polio free status	No indigenous wild poliovirus cases reported however there were importation of WPV in 2007, 2008 and 2010.
3	Sustain MNT elimination status	Sustained
4	Initiate measles elimination	Plan to achieve measles elimination by 2016
5	Expand VPDs surveillance	Integrated surveillance for AFP, measles, JE, NNT and pneumonia for AI

SN	Objective	Status of achievement
6	Accelerate control of other VPDs through introduction of new vaccines	Hib and JE vaccine introduced in RI
7	Improve and sustain immunization quality	Immunization quality sustained
8	Expand immunization services beyond infancy	TT school immunization continues in 12 districts

Chapter 2: Situation Analysis

National Immunization Programme

The National Immunization Program (NIP) is the government's high priority program (P1). Currently, NIP provides vaccination against 9 major killer diseases (table 2.1). Although the immunization service is mainly delivered through the government health network, however there is a slow but increasing trend of immunization service delivery through the private sector especially in urban areas. In private sector, immunization services are delivered through private clinics, hospitals and nursing homes as well as through NGOs clinics. The government supplies all vaccines and immunization related logistics to these private institutions free of cost. All vaccines under National Immunization Programme are given free of cost

The National Immunization Program is under the Child Health Division (CHD) of Department of Health Services (DoHS). The NIP works closely in coordination with other divisions of DoHS including Logistics Management Division (LMD) (cold chain section is under LMD), National Public Health Laboratory (NPHL), National Health Education, Information and Communication Center (NHEICC), National Health Training Center (NHTC) and Epidemiology and Disease Control Division (EDCD). The NIP also works closely with partner agencies mainly WHO, UNICEF and GAVI.

Table 3: Vaccination schedule

Name 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 – HepB - Hib	3	6, 10, and 14 weeks of age
Measles	1	9 months of age
TT	2	Pregnant women
JE	1	12-23 months (high risk districts)

Routine Immunization service in Villages (VDC)

Immunization services are provided mainly through fixed and outreach clinics. There are about 3-5 outreach clinics per VDC based on the local micro plan. Some areas in mountain districts mobilize mobile teams to reach children in hard-to-reach areas. The vaccinators are mainly Village Health Workers (VHW) and Maternal & Child Health Worker (MCHW). The vaccination is supported by Female Community Health Volunteers (FCHVs).

Problem overview:

- Micro plan not reviewed and updated yearly
- Outreach session not run as per the micro plan
- No special strategy implemented for hard-to-reach children
- Defaulter tracing mechanism not functioning adequately
- Vacant VHW posts
- No sanctioned post of VHW/MCHW in health posts (HPs) and in primary health centers (PHCs)
- Health facilities management committees not proactive for immunization in many VDCs
- Inadequate ownership by local government

Routine Immunization service in municipalities

The immunization service is delivered through municipal clinics, government health facilities, private hospitals and private clinics in coordination and collaboration with district health office. Several efforts are underway over the last two years to strengthen immunization services in the municipalities including micro planning, increase in resources mobilization and strengthening coordination between district health office, NGOs and private sectors. The PHC Revitalization Division is coordinating this initiative as a part of urban MCH program.

Problem overview:

- Urban MCH services including immunization structures in municipalities are inadequate and not well defined
- Inadequate ownership by municipalities on MCH services
- Poor access of immunization for urban slums, marginalized and migratory populations
- Not all municipalities have immunization micro plan
- Resource allocation from municipality for immunization inadequate
- Inadequate coordination between district health office, municipality and private sectors

Human Resource Involved in Immunization

The National Immunization section in Child Health Division consists of one NIP Manager and two other technical staff members at central level.

At the regional level there is one EPI focal person in the regional health directorate and cold chain assistant at regional cold room. There is one Refrigerator Technician (RT) in each region.

At district level there is one EPI supervisor and cold chain assistant. At the VDC level there is one VHW and one MCHW.

Problem overview:

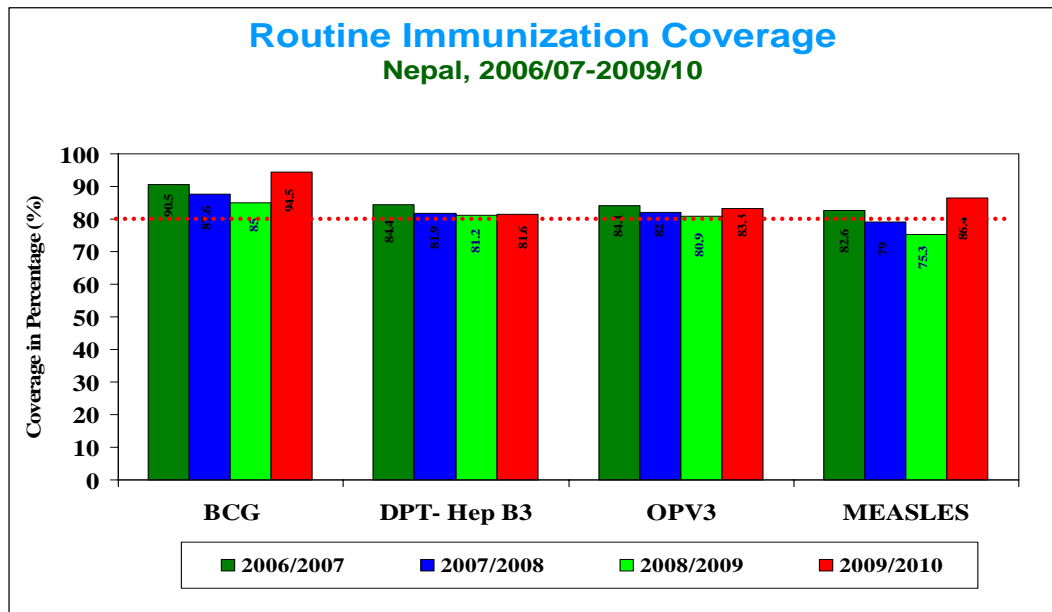
- Immunization Section in CHD is under staffed.
- The number of vaccinators is not proportionate to VDC size and population.
- Knowledge and skill of immunization service provider not regularly updated

Immunization Coverage

Administrative coverage: The vaccination coverage for the last three years remains below the target of 90% and is not uniform across the district and below level.

Administrative DPT3 coverage for last 3 years:

Targets	2007	2008	2009
National DPT3 coverage	82	82	86
No of districts with <80% coverage for DPT3	41 (55%)	33 (44%)	35 (47%)



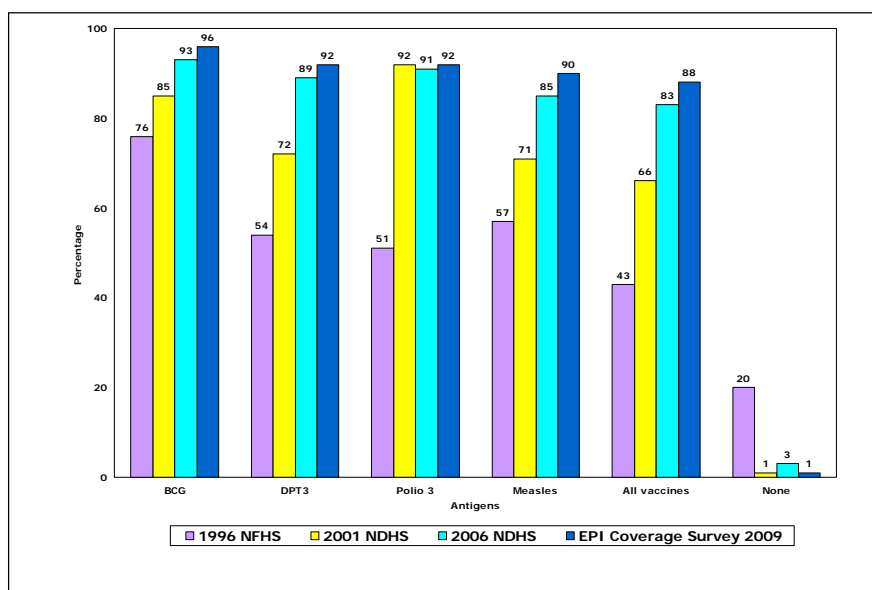
Evaluated coverage: An EPI coverage survey done in 2009 shows 88% coverage for all antigens, 92% coverage for DPT3, 90% coverage for measles and 96% for BCG.

The survey also showed higher immunization coverage for all antigens in the following populations: male, urban population, women with high education (above 10+), hilly region, western region, highest wealth quintile and in Brahm/Chettri/Newar communities.

Table 4: EPI Coverage by background characteristics

Background Variable	BCG	DPT			POLIO			Measles	All Vaccination	Unvaccinated	Percentage with Immunization Card	Number of Children
		1	2	3	1	2	3					
Sex												
Male	96.9	96.6	94.9	92.7	97.0	95.2	93.1	91.1	89.2	0.4	33.5	5,072
Female	95.3	94.9	93.0	90.7	95.3	93.4	91.0	88.5	86.5	0.5	31.3	4,703
Residence												
Urban	98.2	98.0	97.2	96.6	98.1	97.5	97.0	94.2	93.8	0.4	42.6	1,233
Rural	95.8	95.5	93.5	91.0	95.9	93.9	91.4	89.3	87.1	0.5	31.0	8,542
Education												
No education	93.4	92.9	90.2	86.6	93.6	90.7	87.2	84.2	81.3	0.8	27.5	5,198
Primary	98.4	98.1	97.1	95.6	98.3	97.1	95.7	94.0	92.6	0.4	34.5	1,735
Some Secondary	99.8	99.6	99.0	98.5	99.7	99.1	98.6	97.5	96.8	0.0	39.2	1,808
SLC and above	99.7	99.8	99.2	98.9	99.7	99.3	99.1	98.2	97.6	0.0	42.0	1,034
Eco-region												
Mountain	94.8	95.2	92.3	88.8	95.2	92.3	88.9	87.9	84.8	0.4	27.6	2,461
Hill	96.5	95.8	94.3	92.9	96.1	94.5	93.0	91.2	89.5	0.7	29.2	3,806
Terai	96.7	96.2	94.8	92.6	96.9	95.6	93.4	89.8	88.3	0.3	39.3	3,508
Development Region												
Eastern	96.6	96.1	94.2	92.4	96.5	94.6	92.8	90.4	89.1	0.5	36.5	2,289
Central	96.6	96.2	94.8	92.6	96.9	95.5	93.3	90.1	88.2	0.6	29.9	2,191
Western	97.7	97.1	96.6	95.4	97.1	96.6	95.6	93.6	93.0	0.3	39.7	1,425
Mid-Western	95.0	96.0	93.5	91.0	96.4	93.8	91.5	89.2	86.4	0.4	25.6	1,787
Far-Western	95.0	94.0	91.5	88.2	94.1	91.6	88.2	87.1	84.1	0.5	31.4	2,083
Wealth Quintile												
Lowest	91.8	91.5	88.0	84.5	92.0	88.1	84.6	83.1	79.5	1.1	19.6	2,200
Second	96.1	95.8	94.2	91.4	96.0	94.3	91.5	89.4	87.6	0.6	27.7	2,028
Middle	96.9	96.3	94.9	92.4	96.8	95.5	92.8	89.8	87.9	0.3	34.9	1,916
Fourth	97.5	97.0	95.6	93.9	97.8	96.1	94.7	92.1	90.5	0.1	39.2	1,827
Highest	99.3	99.1	98.5	98.1	99.3	98.9	98.4	96.4	95.8	0.2	43.8	1,804
Total	96.1	95.8	94.0	91.7	96.2	94.3	92.1	89.9	87.9	0.5	32.4	9,775

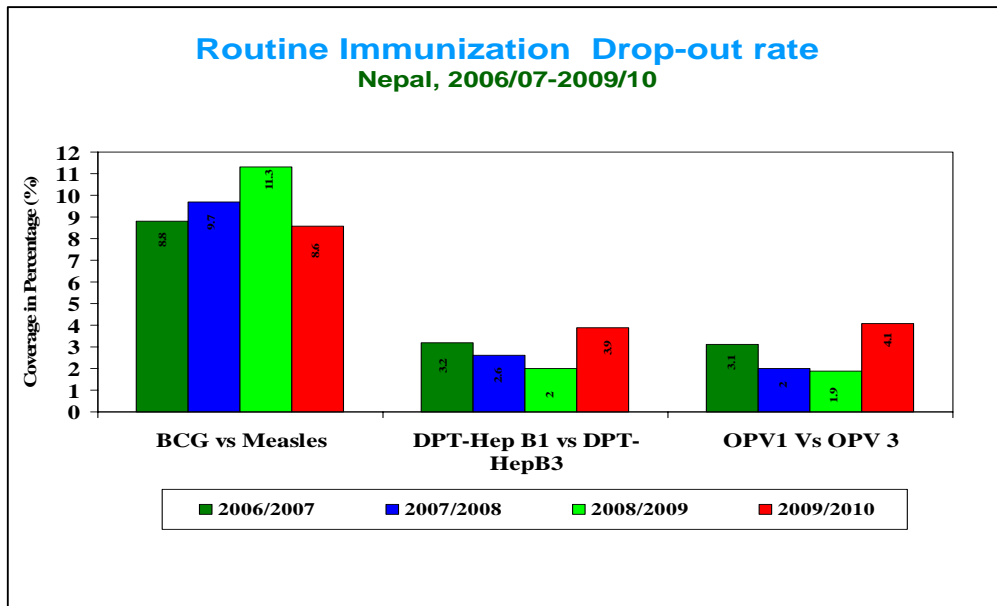
Figure 2: Trend in immunization coverage among children 12-23 months shown by various surveys



Drop-out rate

The drop-out rate is gradually decreasing and is less than 10%

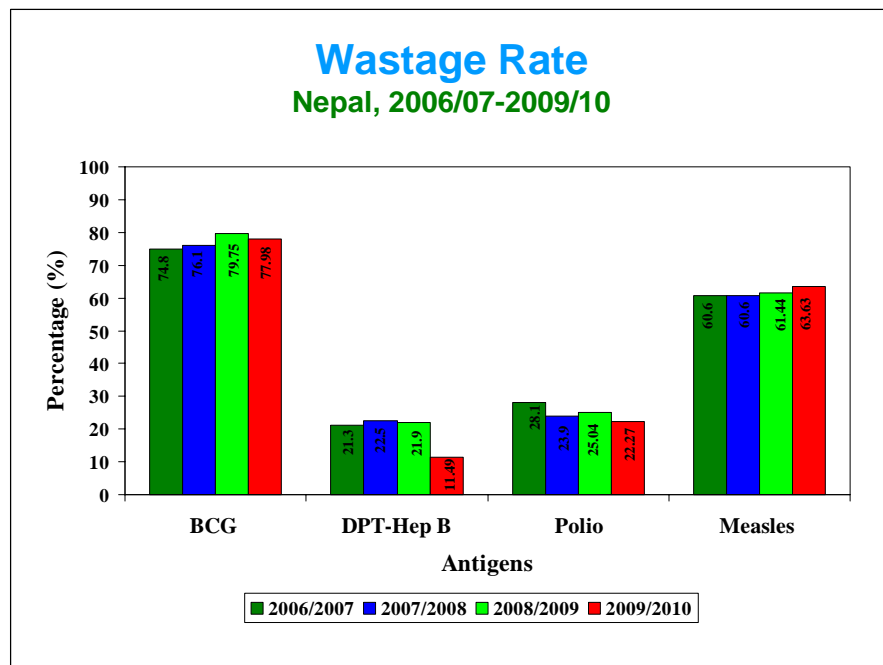
Figure 3: Routine immunization drop-out rate



Vaccine Wastage

Nepal has policy of using one vial per session for lyophilized vaccines (BCG, measles) resulting in high wastage rate. For multi dose liquid and oral polio vaccine Nepal has adopted MDV policy. The wastage rates are as follows in the figures below.

Figure 4: Routien immunization vaccine wastage rate



Source: Annual Reports, Department of Health Services/MOH

Problem overview:

- Routine immunization not achieving targeted coverage and is not uniform across the regions, districts, VDCs and municipalities
- Monitoring of vaccine wastage at different levels is inadequate

Vaccine and logistics management

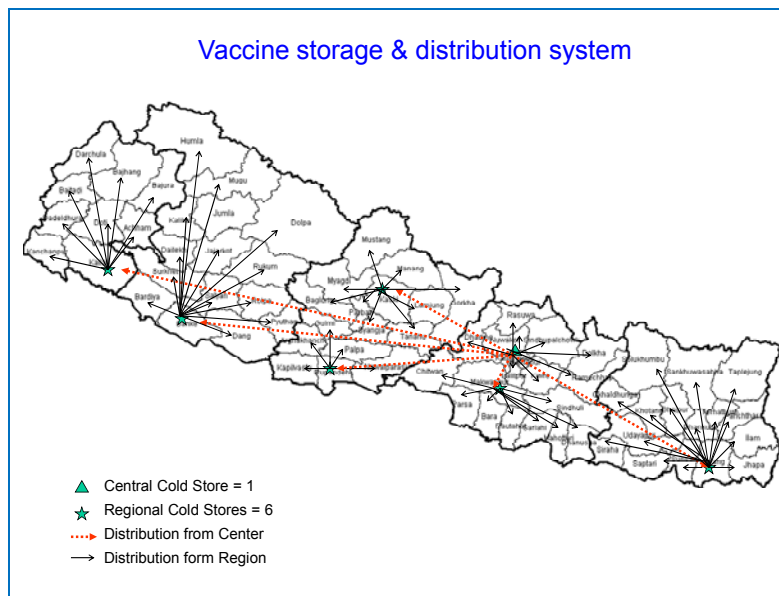
Vaccine and logistics needs are forecasted at the national level by the immunization section based on projected target population, number of session and wastage rates. But forecasting for lyophilized vaccines is done based on number of EPI session conducted each month. As per the national policy all vaccines procured should have vaccine-vial monitors and prequalified by the WHO (except JE). Nepal uses AD syringes and safety boxes in all immunization activities

The Department of Drug Administration is the national regulatory authority responsible for monitoring the quality of vaccines.

EPI related vaccine and logistics storage and distribution

The Cold Chain Section under the Logistics Management Division manages the storage, distribution, and transportation of vaccines and EPI related logistics.

Figure 5: Vaccine storage and distribution system



As per the existing policy the central store should have a maximum of 13 months and minimum of 7 months stock level, regional medical stores have maximum of 4.5

months and a minimum of 3 months stock levels and districts stores have maximum of 2.25 months and a minimum of 1.25 months stocks.

Logistics Management Information System (LMIS) is in place to record and report vaccine and logistics related information. At district level reports are compiled every month and at center level every three months.

Problem overview:

- Dry space for the storage of syringes, safety boxes and cold boxes inadequate in some districts
- Weak vaccine inventory control
- Vaccine distribution plan not properly followed
- Logistics Management Information System not adequately utilized
- Vaccine management below district level is poor
- Anti Rabies Vaccines and other drugs occupy space originally planned for RI vaccines at Regional and district level cold chain equipment resulting in shortage of storage capacity
- Vaccine logistics not always bundled
- SOPs not always followed

Cold chain capacity

Currently the central, regional and district cold room have enough storage capacity for present routine as well as campaign vaccines. However, some cold chain equipments are at the end of functional life and the cold room building and physical infrastructure are in poor state and inadequate. A ten year cold chain equipment replacement plan has been finalized and the government will carry out cold chain capacity expansion as per the replacement plan.

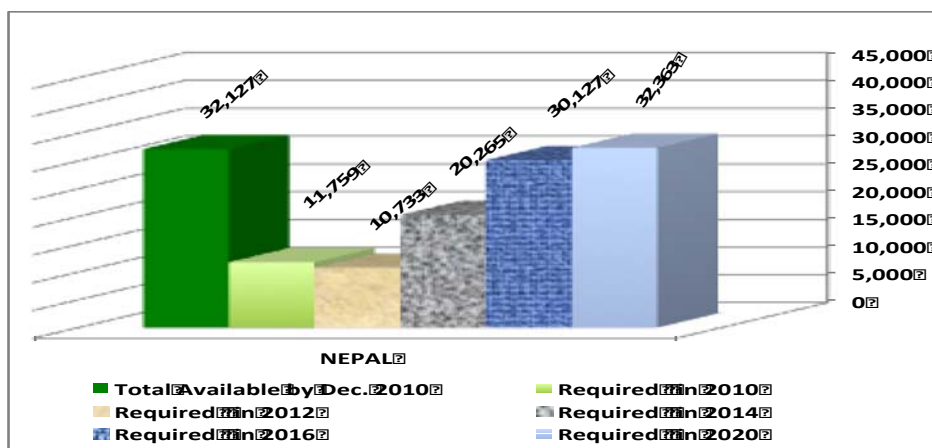
Total space available, required and resulting excess or shortfall at the Regional level at +2 to +8° C

Figure 6: Cold chain capacity (in ltrs)

Total space required and available in Litres

		Storage volume at + 2 to +8 deg C (LTRs)									
RMS	Total Available by Dec. 2010	Now		2012 Replacement of M by MR		2014 Introduction of PCV-7		2016 Introduction of Rotavirus		2020 same as 2016	
		Required in 2010	(+) Excess (-) Shortfall	Required in 2012	(+) Excess (-) Shortfall	Required in 2014	(+) Excess (-) Shortfall	Required in 2016	(+) Excess (-) Shortfall	Required in 2020	(+) Excess (-) Shortfall
BIRATNAGAR	13,018	2,342	10,676	2,170	10,848	4,612	8,406	7,138	5,880	7,695	5,323
HETAUDA	3,396	1,835	1,561	1,755	1,641	3,888	-492	6,095	-2,699	6,568	-3,172
BUTWAL	10,282	1,002	9,280	935	9,347	2,098	8,184	3,301	6,981	3,559	6,723
POKHARA	8,688	861	7,827	785	7,903	1,708	6,980	2,663	6,025	2,868	5,820
NEPALGANJ	10,282	1,333	8,949	1,216	9,066	2,602	7,680	4,036	6,246	4,343	5,939
DHANGADI	8,386	883	7,503	822	7,564	1,841	6,545	2,895	5,491	3,121	5,265
TEKU	7,970	1,321	6,649	1,174	6,796	2,771	5,199	4,422	3,548	4,776	3,194

Figure 7: Cold chain capacity and future requirement



The graph Above depicts the present status and the increasing storage needs at the national level for +2 to +8 C storage, upon introduction of PCV-13 in 2014 and Rotavirus in 2016.

Most of the RMS will have sufficient storage space till 2020, with the exception of RMS Hetauda which will require one WIC having a net capacity of 5,000 liters from 2014. Currently 56 districts have sufficient vaccine storage capacity at +2 to +8⁰ C.

Use of solar refrigerators

There are a total of 30-40 solar refrigerators/freezers currently operational in Nepal which were procured and supplied by different agencies. The solar units have become popular due to poor supply of electricity and kerosene in the districts.

Contingency plan

Contingency plan for prevention of vaccine damage and cold chain equipment during emergencies needs strengthening at central, regional & district levels. The plans need to be implemented at all levels.

Problem overview:

- Inadequate cold chain infrastructure at central and some districts
- No regular training for preventive maintenance of cold chain equipments
- Supervision at central and regional level inadequate
- Some of the existing cold chain equipments (WIC, WIF, Freezers) are old and need urgent replacement
- Technical capacity of many of the RTs, CCAs is inadequate for repair & maintenance of equipments including solar refrigerators / freezers.
- No strategy on establishment and running of sub centers below districts
- No workshop at centre or region for repair & maintenance of cold chain equipment
- Contingency plan at central, regional and district cold rooms not always available
- Lack of advanced technology for monitoring of temperature in cold chain at all levels

Injection safety and waste disposal

Safe Injection

The MOHP adopted injection safety policy in 2003. Auto-disable syringes (ADS) are used for all injectable antigens in routine immunization and SIAs.

Waste disposal

Used syringes and needles are collected in safety boxes and vials and plastic waste are collected in separate polythene bags. The waste disposal is primarily through open-pit burning and burying. In some places where incinerators are available, waste is disposed through incineration.

Problem overview:

- Incinerators available only in few health facilities and do not meet WHO standards
- Burn and bury still a major way of sharp disposal, no other methods applied for waste disposal
- Waste disposal in municipalities needs to be explored

Adverse events following immunization (AEFI)

The AEFI surveillance system started in 2004 with 31 sentinel sites. Expansions of sentinel sites are ongoing and the system is currently functioning in 38 districts. An AEFI field guide was revised and flash cards on flow chart of the reporting of AEFI cases were developed for distribution and to establish a reporting system in all 75 districts. An AEFI committee was formed in 2009 for proper investigation of AEFI and monitoring of vaccine safety.

Table 5: Number of reported AEFI cases

Year	2007	2008	2009	2010
No. of AEFI cases	3	12	11	3
No. of death	1	1	5	2

Problem overview:

- No monthly AEFI zero reporting system from all 75 districts
- Immediate reporting followed by case investigation not always done timely and thoroughly
- AEFI reporting not yet included in HMIS reporting system
- Inadequate resources and capacity to manage AEFI

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

The EPI coverage survey (2009) has shown that the reasons for not fully immunized are as follows:

- Unaware of need for immunization (48%)
- Fear of side effects (44%)
- No faith in immunization (36%)
- Wrong ideas about contraindications (25%)
- Mother/Guardian too busy (23%)
- Place of immunization too far (34%)

A BCC strategy for MNCH has been developed under the leadership of NHEICC with immunization both routine and campaigns being a part of the strategy. The NHEICC carries out several activities in coordination with CHD, UNICEF and other partners. The district health offices also carry out various social mobilization activities. The school teachers, child clubs, local leaders, FCHVs and mother groups have been mobilized for strengthening immunization

Problem overview:

- BCC and social mobilization and advocacy activity inadequate, especially targeting hard-to-reach, disadvantaged and marginalized population
- No continuous flow of immunization messages using different media & in different languages
- Inadequate counseling by health workers and volunteers to caretakers & mothers
- Mobilization of schools, community, teachers and of other relevant stakeholders inadequate
- Inadequate BCC and IEC materials and message in local languages
- Inadequate utilization of culturally appropriate and locally available IEC / BCC activities

Recording and Reporting System

Data from all outreach sessions and static clinics are recorded and collected at grassroots level and are sent to health facilities every month. The health facilities compile and send reports to the district every month. The DHOs compile, analyze, and send coverage reports to the Health Management Information System and the RHD every month. Quarterly reviews of all immunization related data exist at district level. The DHO categorizes VDC data by coverage, drop-out rates and number of unimmunized children to identify high- and low-performing VDCs. At each level monthly coverage data are entered in an immunization monitoring chart which has to be filled every month and displayed for the use of health workers and community people for monthly monitoring purposes. Most of the statistical assistants, medical

recorders, health assistants and EPI supervisors are trained for data quality self assessments (DQSA) and many districts conduct DQSA routinely.

Problem overview:

- Immunization data and monitoring tool not always used for program improvement at local level
- Reporting from private sector and municipalities needs strengthening.

Eradication, elimination and control of vaccine preventable diseases

Polio Eradication

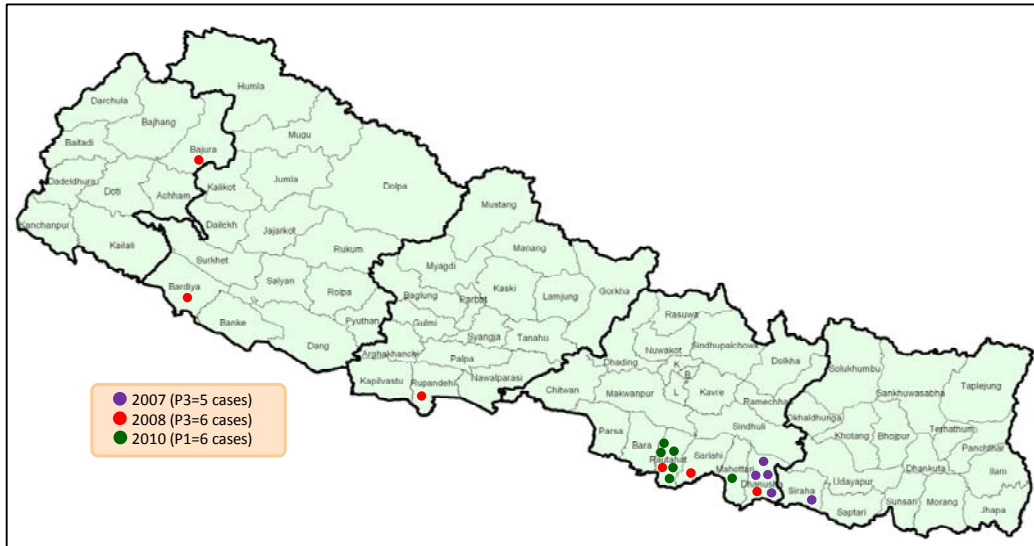
In 1996, Nepal initiated polio eradication efforts by holding the first National Immunization Days in all 75 districts. AFP surveillance was established in 1998 and is supported by WHO surveillance medical officers (SMO). In 2010 non-polio AFP rate was 5.31 and adequate stool collection rate was 89%.

The last indigenous case of WPV in Nepal was detected in 2000. There were no WPV cases reported during 2001-2004. However, since 2005, every year four to six cases have been reported except in 2009 mostly from the districts bordering UP and Bihar states of India. Forty-five percent of the total WPV cases reported since 1999 were from two districts (Dhanusha and Rauthaut)

Table 6: History of polio cases, 1999-2010

Year	Type of WPV	Districts
1999	2 (P1)	Banke-1, Saptari-1
2000	4 (P3)	Siraha-1, Mahottari-1, Dhanusa-1, Rauthaut-1
2005	4 (P1)	Sarlahi-2, Rauthaut-2
2006	5 (P1)	Dailekh-1, Kapilbastu-1, Parsa-2, Rauthaut-1
2007	5 (P3)	Siraha-1, Dhanusa-4
2008	6 (P3)	Rauthaut-1, Sarlahi-1, Dhanusa-1, Bajura-1, Bardiya-1, Rupendehi-1
2010	6 (P1)	Mahottari-1, Rauthaut-5
Total	32	13 districts

Figure 8: History of polio cases, 2007-2010



Supplementary Immunization Activities (SIAs)

The first NID was conducted in 1996. In subsequent years, Nepal has conducted several rounds of NIDs (13th NID in 2011), Sub-National Immunization Days (SNIDs), and targeted mopping-up campaigns in response to the detection of polio cases and to maintain high population immunity against polio. The coverage during the campaign has been >90%. During the most recent campaigns efforts to promote hygiene and sanitation activities were also included.

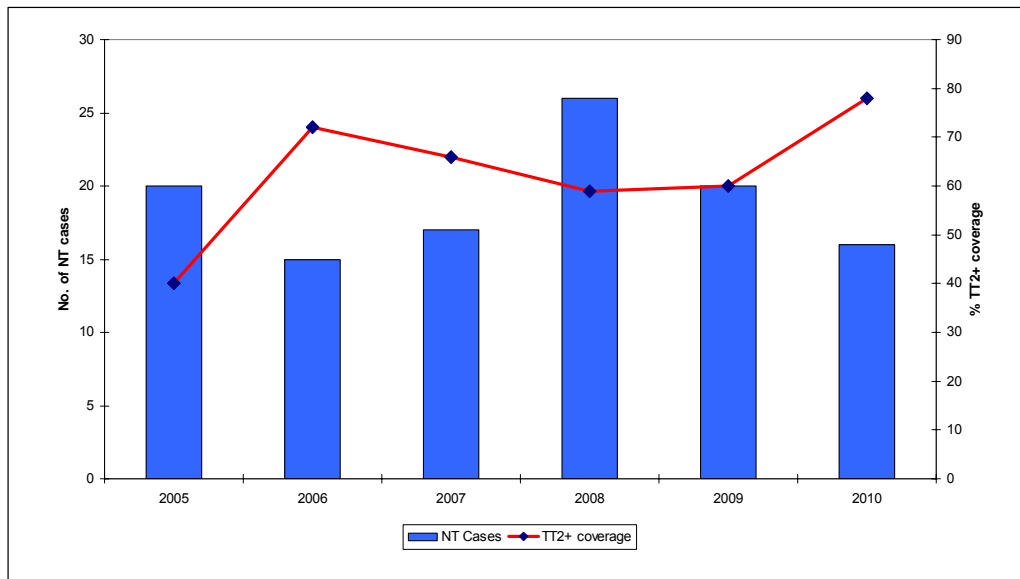
Problem overview:

- Routine OPV3 coverage not uniform
- Around 5-10% of children still missed during campaigns mainly in urban areas
- Polio still occurring in neighboring country
- Funding gap

Maternal and Neonatal Tetanus Elimination

Nepal initiated NT elimination activities in 2001-2004 by conducting TT campaigns targeting women 15-49 yrs and later to 10-39 years of age. NT cases have been reported through HMIS since 1995 and NT surveillance was integrated with WHO/IPD AFP surveillance network in 2003. MNT elimination was validated in 2005

Figure 9: Neonatal tetanus cases , Nepal, 2005-2010



After the validation of MNT elimination in Nepal in 2005, the challenge has been in maintaining the elimination status. To sustain MNT elimination the government is targeting for high coverage for DPT3 continued NT surveillance, increased delivery by SBAs and initiation of school TT campaigns for girls and women of select age groups in high risk districts.

In 2006 the school based immunization program to provide TT to students in grades 1, 2 & 3 was initiated in 12 districts. Due to changes in WHO recommendations for TT vaccination in 2008, Nepal modified TT vaccination strategy to include students in grade one

Low-dose of diphtheria and tetanus toxoid vaccine (Td) – The government plans to replace TT vaccine with Td vaccine based on WHO recommendation in position paper on tetanus vaccination. Td will be used in school based immunization, campaign and for pregnant women.

Problem overview:

- TT 5 dose policy to be reviewed and implemented
- Slow scale up of school based TT immunization
- Funding gap for conducting follow up Td campaigns in high risk districts
- No clear strategy to sustain MNT elimination status

Accelerated measles control

Nepal adopted the measles mortality goal set at the UN special session on children in May 2002 and the World Health Assembly. Nepal expressed its commitment during Cape Town Declaration on measles elimination in 2003

The goal of Nepal's Measles Mortality Reduction Strategic Plan 2003-2007 was to reduce measles deaths by 50% by 2009 relative to FY2002/03 level. The immunization coverage survey (2009) showed an overall 90% coverage for MCV-1. The number of districts having > 90% routine measles coverage has increased from 15 in 2007 to 31 in 2010.

Nepal successfully completed measles catch-up campaigns targeting children 9 months to under 15 years of age in 2004/05 reaching >9.8 million children (100%). In 2008, Nepal conducted a follow up campaign targeting children 9 months to under 5 years of age reaching 3,634,590 children (93% coverage). The number of confirmed measles cases has drastically reduced after the campaigns.

Measles surveillance was integrated with AFP surveillance in 2003. Case based surveillance started in 2007 and has expanded from 31 sites in 2007 to 212 sites in 2010.

Table 7: Number of suspected measles cases and laboratory confirmed measles cases by year, Nepal, 2003-2010

Year	Total Number of reported Suspected Measles Cases*	Number of suspected measles outbreaks investigated	Number (%) of outbreaks confirmed as measles outbreaks	Number (%) of outbreaks confirmed as rubella outbreaks	Number (%) of outbreaks confirmed as mixed measles & rubella outbreaks
2003	13,344	67**	41 (61%)	***	***
2004	12,047	197	138 (70%)	13 (7%)	11 (6%)
2005	5,023	46	1 (2%)	36 (78%)	2 (4%)
2006	2,838	31	2 (6.5%)	24 (77%)	1 (3.%)
2007	1415	21+	3 (14%)	11 (52%)	1 (5%)
2008	2,089	39	6 (15%)	27 (69%)	1(2.5%)
2009	4,340	66	2 (3%)	57 (89%)	-
2010	2,550	33	7 (21%)	19 (58%)	2 (6%)

Source: JRF WHO-UNICEF/WHO-IPD
HMIS/DoHS/MOHP

** Outbreak investigation and laboratory testing started in March 2003

*** Lab-confirmation for rubella specific IgM did not start until January 2004

+ Samples QNS from 2 outbreaks

WHO estimated child deaths due to measles for, 2000-2009 using natural history models. Over this period the estimated number of measles deaths declined by 99% from 1831 deaths in 2000 to <10 in 2009. Measles deaths among children under five

years of age were estimated to total 8,161 over 2000-2009, accounting for 1.7% of the 493,502 estimated total child deaths over this period.

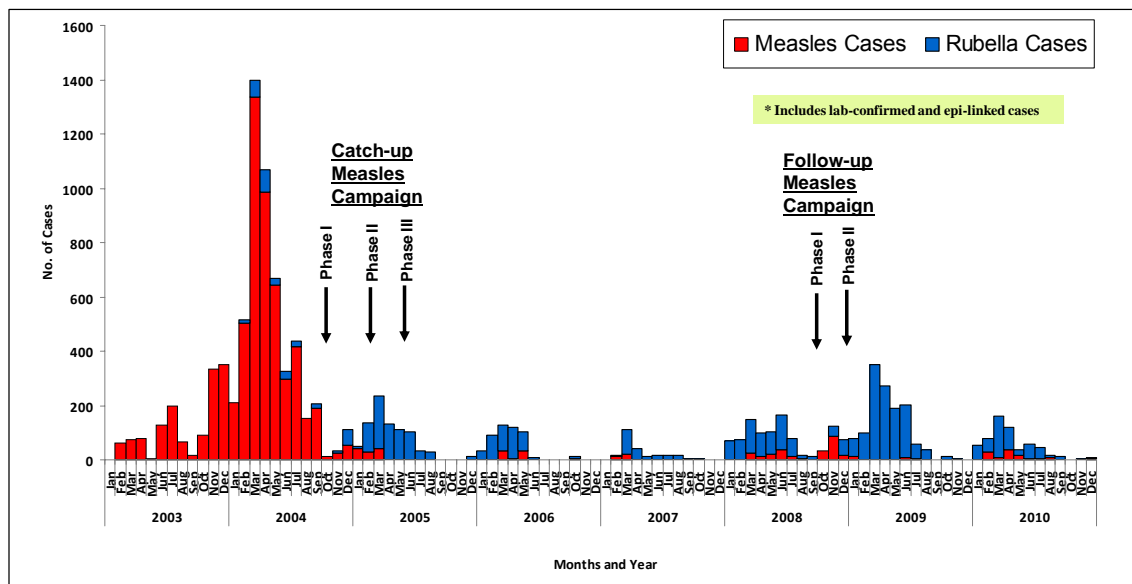
Problem overview:

- Low routine measles coverage required for elimination
- Case based surveillance not yet expanded in all health facilities
- Immunization response policy to outbreak not yet established

Control of CRS/Rubella

After the catch-up and follow up measles campaigns in 2005 and 2008, the number measles cases were dramatically reduced and unmasked the ongoing transmission of rubella cases. There were 11 confirmed rubella outbreaks reported in 2007, 29 in 2008, 59 in 2009 and 19 in 2010. A total of 15, 535 febrile rash illness cases reported during 2004 to 2009, of which 10,116 were from outbreak investigations and 5,419 were from sentinel surveillance reporting. Of 15,535 cases 3,710 (24%) of reported febrile cases were confirmed rubella (1,187 lab-confirmed and 2,523 epi-linked rubella). Rubella cases show seasonal distribution peaking in late winter/early spring.

Figure 10: Confirmed Measles and Rubella Cases 2003, 2010, Nepal.



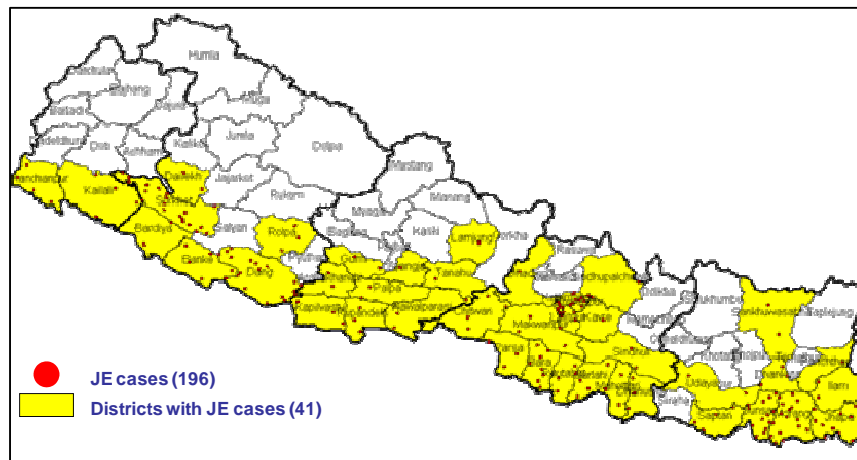
A sero-prevalence study among WCBA (15-39 yrs) conducted in 2008 showed an estimated 6,091 pregnant women infected with rubella and 1,426 estimated infants born with CRS with rate of 192/100,000 live births. A cross-sectional study conducted in August 2009 in students attending a School for the Deaf, documented the presence of CRS.

Problem overview:

- No program for control of CRS/rubella
- No CRS surveillance

Control of Japanese Encephalitis (JE)

AES (JE) surveillance is integrated with AFP surveillance. In 2010, a total number of 183 JE confirmed cases were reported from 40 districts (2007=442, 2008=339 and 2009=147 JE cases). Out of 183 JE confirmed cases reported, 129 cases mostly above 15 yrs of age were reported from districts covered by campaigns, where as 54 cases mostly from above 15 yrs of age were reported from non campaign districts. Transmission occurs primarily from July-September and both children and adults are affected

Figure 11: Lab-confirmed JE cases, Nepal, 2010

The vaccination campaigns against JE began in 2006 using live attenuated SA-14-14-2 JE vaccine in high risk districts. As of 2010, the campaigns were completed in 23 districts. All persons above one year of age were vaccinated in 12 districts and persons above one year of age and below fifteen years of age were vaccinated in 11 districts.

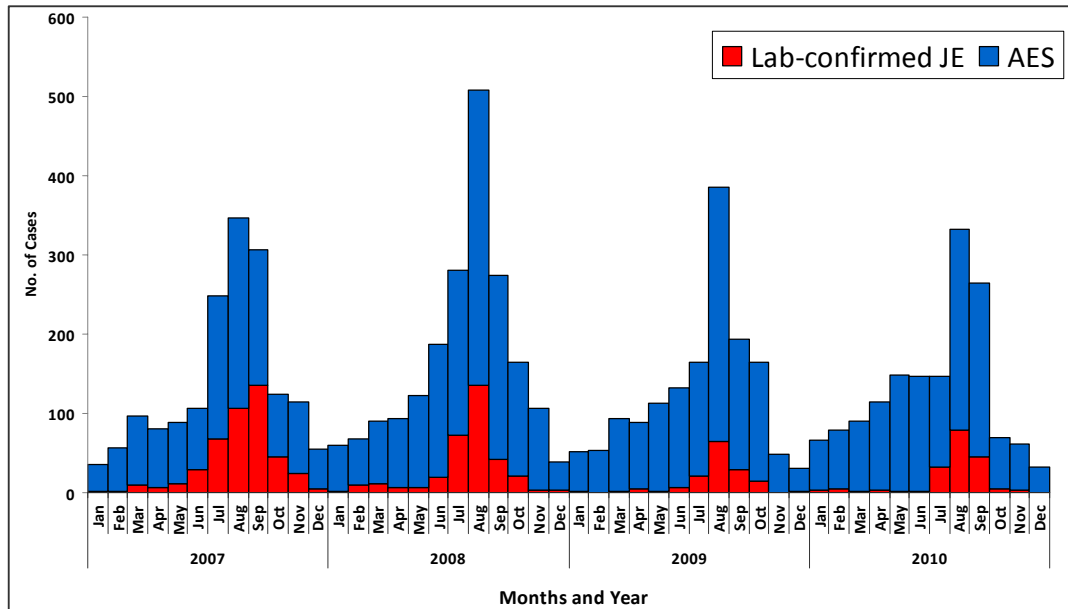
JE vaccine was introduced into the routine immunization program in 2009 in the post JE campaign districts. As of 2010, 23 districts have introduced JE into routine immunization targeting children 12-23 months of age. The coverage ranges widely from 8-73%.

A JE vaccination impact study conducted in 2009 with CDC support showed: In the 23 districts that had vaccination campaigns between 2006 and 2009, the observed AES and JE incidence rates in the post-campaign period were 58% and 72% lower than the expected rates had no program occurred.

The greatest impact was in the four high risk western Terai districts that historically have had high JE disease burden (where observed AES and JE incidence rates

were both 84% lower than the expected rates). Impact was higher in the districts that implemented campaigns for all the population ≥ 1 year of age than those that had campaigns for 1-15 year olds; however this group included the four high incidence western Terai districts.

Figure 12: AES and Lab Confirmed JE cases, Nepal, 2007-2010



Problem overview:

- Low routine JE coverage
- All high risk districts not yet included in JE campaign
- Future strategic guideline for control of JE not yet developed

Introduction of new and under used vaccines

The National Committee on Immunization Practice was established in 2009 to provide vaccine related recommendations to the government. NCIP provides recommendations on introduction of new vaccines and other immunization related policies to the government.

Nepal introduced Hepatitis B in 2002 and Hib as pentavalent vaccine in 2009 with GAVI co financing. JE vaccines were introduced in 2008 in routine immunization using government funds.

Rubella Vaccine – The GoN is considering introducing rubella vaccine in routine immunization along with MCV-1 after completing an MR campaign in 2012.

Pneumococcal vaccine – Considering that pneumonia is still the major cause among deaths in under five children and that streptococcus is a significant standing

cause of pneumonia, otitis media and meningitis in children under five years of age, Nepal is seriously considering generate more evidence to make an informed decision about pneumococcal vaccine introduction.

Rota virus vaccine – As per published scientific papers Rotavirus continues to be an important cause of diarrhea and dehydration in among children 6 months to 24 months of age in developing countries. Disease burden studies of rota virus in Nepal are ongoing

The government will continue disease burden studies for other new and underused vaccines, which may include cholera, HPV, HepA, typhoid, mumps and meningitis from other causes and as well as others

Problem overview:

- Disease burden of many VPDs not yet known
- High cost of new vaccines
- Financial sustainability

VPD Surveillance

The current diseases under VPD surveillance supported by WHO surveillance medical officers' network includes AFP, measles, NNT, JE and pneumonia for a novel or pandemic prone influenza. There are >490 weekly reporting sites throughout the country and of them 89 are active surveillance sites. The diseases under VPD surveillance are targeted for eradication, elimination or control.

Problem overview:

- Government surveillance capacity still inadequate
- Long term plan for disease surveillance not yet developed
- Financial sustainability of the existing surveillance system

Immunization beyond infancy

Currently the government of Nepal is providing TT vaccine to grade one (6 yrs) school children in 12 districts as a part of school based immunization program. The government plans to expand TT/Td vaccination to grade one and grade 8 children and to include additional districts integrating with a school health program.

Chapter 3: Goal, Objectives and Milestones

Goal

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

Objectives

The objectives of NIP for next five years (2011-2016) are as follows:

1. Achieve and maintain at least 90% vaccination coverage for all antigens both at national and district level by 2016
2. Ensure access to vaccine of assured quality and with appropriate waste disposal
3. Achieve and maintain polio free status
4. Maintain maternal and neonatal tetanus elimination status
5. Achieve measles elimination status by 2016
6. Accelerate control of vaccine-preventable diseases through introduction of new and underutilized vaccines
7. Expand VPD surveillance
8. Continue to expand immunization beyond infancy

Milestones

Objectives	2011/12	2012/13	2013/14	2014/15	2015/16
1. Achieve and maintain at least 90% vaccination coverage for all antigens at national & district level by 2016	Achieve and sustain 90% DPT3 coverage in 35 districts and all antigens in 20 districts	Achieve and sustain 90% DPT3 coverage in 50 districts and all antigens in 30 districts	Achieve and sustain 90% DPT3 coverage in 60 districts and all antigens in 50 districts	Achieve and sustain 90% DPT3 coverage in 75 districts and all antigens in 65 districts	Sustain 90% DPT3 coverage in 75 districts and achieve 90% coverage for all antigens in 75 districts
2. Ensure access to vaccine of assured quality and with appropriate waste disposal	At least 20 district with AEFI monthly zero reporting	At least 60 districts with AEFI monthly zero reporting	All 75 districts with AEFI monthly zero reporting	-	-
3. Achieve and maintain polio free status	Zero cases of WPV	Zero cases of WPV	Zero cases of WPV	Eradication of poliomyelitis	
4. Maintain maternal and neonatal tetanus elimination status	Conduct Td campaign in 10 high risk districts	Conduct Td campaign in 10 high risk districts	Conduct Td campaign in 10 high risk districts	Conduct Td campaign in 10 high risk districts	-
5. Achieve measles elimination status by 2016	1..Achieve and sustain at least 95% MCV-1 coverage in 35 districts	1..Achieve and sustain at least 95% MCV-1 coverage in 50 districts	1..Achieve and sustain at least 95% MCV-1 coverage in 60 districts	1..Achieve and sustain at least 95% MCV-1 coverage in 70 districts	1.Achieve and sustain 95% MCV-1 coverage in 75 districts
	-	-	2. Achieve and maintain elimination standard surveillance performance indicator		
	-	-	-	3.Achieve a measles incidence of less than one confirmed case per million population per year	
6. Expand VPD surveillance with possibility of integration	Continue penumo and rota sentinel sites, initiate typhoid & cholera sentinel surveillance	Continue penumo, typhoid, cholera and rota sentinel sites, initiate CRS surveillance, conduct HepB sero survey	Continue penumo, typhoid, cholera, rota & CRS sentinel surveillance	Continue penumo, typhoid, cholera, rota & CRS sentinel surveillance	Continue penumo, typhoid, cholera, rota & CRS sentinel surveillance
7. Accelerate control of vaccine-preventable diseases through introduction of new and underused	-	Introduce rubella vaccine into RI	Introduce pneumococcal vaccine into RI,	-	Introduce Rota vaccine into RI

Objectives	2011/12	2012/13	2013/14	2014/15	2015/16
vaccines			Consider HepB birth dose		
8. Continue to expand immunization beyond infancy	Expand school based Td vaccination in 2 additional districts with school health program, Expand Td vaccination to grade 1 & 8 students	Expand school based Td vaccination in 2 additional districts,	Expand school based Td vaccination in 2 additional districts	Expand school based Td vaccination in 3 additional districts -	Expand school based Td vaccination in 4 districts -

Chapter 4: Indicators, strategies, activities, timelines and responsible areas

Objective 1: Achieve and maintain at least 90% coverage of all antigens at national and district level by 2016

Performance Indicators

- Percentage of districts with vaccination coverage >90% for each antigen
- Percentage of districts with drop-out rates less than 10 percent for BCG -measles and DPT1-DPT3
- Percentage of TT2+ coverage for pregnant women
- Percentage of sessions conducted against scheduled

Strategies, Key Activities, Timelines, Responsibilities

Strategy 1: Increase access to vaccination by implementing RED micro planning in every district						
Key Activities	Timelines					Responsibility
	2011/12	2012/13	2013/14	2014/15	2015/16	
• Review and finalize RED micro planning guideline and training materials	X	-	-	-	-	CHD, WHO, UNICEF
• Conduct MToT for RED micro planning	25 People	25 People	25 People	-	-	CHD, WHO, UNICEF
• Conduct RED micro planning (using CBCNP denominator where applicable)	30 Districts	30 Districts	15 Districts	-	-	Districts
• Review implementation of micro planning in those districts that have completed RED micro planning	30	60	75	75	75	CHD, Districts
• Develop strategy for integration of immunization with other child health and family health activities (polio with VitA, Child Health week, PIRI)	X	X	-	-	-	CHD, WHO, UNICEF
• Periodic intensification of RI through immunization month	X	X	X	X	X	CHD, Districts

Strategy 2: Enhance human resources capacity for immunization management						
Key Activities	Timelines					Responsibility
	2011/12	2012/13	2013/14	2014/15	2015/16	
• Revise, develop, print and distribute training materials on immunization (Flip chart and others)	X	X	X	X	X	CHD, WHO, UNICEF
• Revise, develop, update and distribute policy and strategy	X	X	X	X	X	CHD, WHO, UNICEF

Strategy 2: Enhance human resources capacity for immunization management						
Key Activities	Timelines					Responsibility
	2011/12	2012/13	2013/14	2014/15	2015/16	
document on immunization (MLM, IIP, cMYP)						
• Conduct MLM training	20 People	20 People	20 People	20 People	20 People	CHD, WHO, UNICEF
• Conduct refresher training for vaccinators	-	-	-	35 Districts	30 Districts	Districts
• Peer exchange visits	25 People	25 People	25 People	25 People	25 People	CHD, RHD
• Restructuring of NIP	X	X	X			DoHS/MOHP

Strategy 3: Review program performance at all levels						
Key Activities	Timelines					Responsibility
	2011/12	2012/13	2013/14	2014/15	2015/16	
• Share and review annual plan with EPI partners and ICC members at national, regional and district level	X	X	X	X	X	CHD, Districts
• Revise, develop and print guidelines, checklists and reporting formats to ensure effective integrated child health review meetings at each level	X	X	-	-	-	CHD
• Conduct monthly review meetings at the health facility level involving members of the Immunization Committee, Health Institution Committees, and Female Community Health Volunteers and take necessary corrective action at local level	X	X	X	X	X	Health Facilities

Strategy 3: Review program performance at all levels						
Key Activities	Timelines					Responsibility
	2011/12	2012/13	2013/14	2014/15	2015/16	
• Share and review annual plan with EPI partners and ICC members at national, regional and district level	X	X	X	X	X	CHD, Districts
• Conduct monthly review meetings at the Ilaka level involving vaccinators and take necessary corrective action at local level	X	X	X	X	X	District
• Conduct yearly regional level integrated child health review	X	X	X	X	X	CHD

Strategy 4: Strengthen communication, social mobilization, and advocacy activities						
Key Activities	Timelines					Responsibility
	2011/12	2012/13	2013/14	2014/15	2015/16	
• Review, finalize and implement BCC strategy for RI	X	X	X	X	X	CHD, UNICEF, WHO
• Develop an innovative district-specific social mobilization plan using local resources and funding from NHEICC	X	X	X	X	X	Districts, health facilities
• Revise policy and strategy on National Immunization Month & implement according	X	X	X	X	X	CHD, WHO, UNICEF
• Initiate a continuous mass media communications campaign using various channels	X	X	X	X	X	CHD, NHEICC, UNICEF
• Include immunization indicator during social auditing	X	X	X	X	X	Districts, VDC
• Conduct joint planning (GoN & other partners) and monitoring at various level to ensure effective implementation of micro plan and mobilization of DDC and VDC block grant	X	X	X	X	X	Districts

Strategy 5: Strengthen immunization data analysis, monitoring , and use at all levels						
Key Activities	Timelines					Responsibility
	2011/12	2012/13	2013/14	2014/15	2015/16	
• Conduct data analysis at health facility level for immediate use	X	X	X	X	X	HF's, Districts
• Review reported HMIS data at health facility, district, region and central level and provide feedback as appropriate on quarterly basis	X	X	X	X	X	Districts, CHD, HMIS
• Identify need & conduct training on data analysis, and training on interpretation and use of data for action for EPI supervisors	-	X	X	-	-	CHD, HMIS
• Provide computers to EPI section in districts	15 Computers	15 Computers	-	-	-	DoHS
• Conduct DQSA	15 Districts	15 Districts	15 Districts	15 Districts	-	Districts

Strategy 6: Strengthen immunization services in the municipalities						
Key Activities	Timelines					Responsibility
	2011/12	2012/13	2013/14	2014/15	2015/16	
• Develop and implement an immunization policy and guidelines for the municipalities with Division of PHC Revitalization and in coordination with Ministry of Local Development (MoLD)	X	X	-	-	-	RVD, CHD
• Conduct RED micro planning in municipalities in coordination and collaboration with urban health program	15 Municipalities	15 Municipalities	8 Municipalities	-	-	District, Municipality
• Review and monitor implementation of micro plan in	X	X	X	X	X	CHD, RVD, WHO, UNICEF

Strategy 6: Strengthen immunization services in the municipalities						
Key Activities	Timelines					
	2011/12	2012/13	2013/14	2014/15	2015/16	Responsibility
municipalities that have completed micro planning						

Strategy 7: Strengthen supportive supervision and monitoring activities						
Key Activities	Timelines					
	2011/12	2012/13	2013/14	2014/15	2015/16	Responsibility
• Review and update tools for supervision and monitoring	X	X	-	-	-	CHD, WHO, UNICEF
• Conduct a minimum of two joint (government + partners) supervisory visits in a year from the central office to low performing districts using the tools	X	X	X	X	X	CHD, WHO, UNICEF
• Conduct a minimum of three joint (government + partners) supervisory visits & follow up visits in a year to health facilities, VDC and immunization session	X	X	X	X	X	CHD, WHO, UNICEF
• Conduct at least one supervisory visit from district headquarters to all VDCs and immunization session and at least two visits to low-performing VDCs each year	X	X	X	X	X	Districts
• Provide feedback and follow up on implementation of the supervisory findings	X	X	X	X	X	CHD, Districts

Strategy 8: Ensure adequate and sustainable financing for the immunization program

Key Activities	Timelines					Responsibility
	2011/12	2012/13	2013/14	2014/15	2015/16	
• Advocacy meeting with MoF, law makers, policy makers, planners and other stakeholders to ensure availability of funds as per cMYP	X	X	-	-	-	MOHP
• Explore establishing "National Immunization Trust Fund"	X	X	-	-	-	MOHP
• Advocate and track for use of VDC and municipality grant for immunization at local level	X	X	X	X	X	VDC, Municipality and Districts
• Draft and ensure endorsement of immunization act as directed by parliament	X	X				

Objective 2: Ensure access to vaccine of assured quality and with appropriate waste management**Performance Indicators:**

- Reported numbers of stock out at district and below level
- Vaccine wastage rate
- Percentage of district reporting AEFI including zero reporting
- Number of sever AEFI cases reported within 24 hours

Strategies, Key Activities, Timelines, Responsibilities:

Strategy 1: Strengthen the vaccine management system						
Key Activities	Timelines					Responsibility
	2011/12	2012/13	2013/14	2014/15	2015/16	
• Review and implement the policy for forecasting, procuring, storing and distributing vaccines and related logistics	X	X	X	X	X	CHD, LMD
• Procure refrigerator van to transport vaccines	-	1	-	-	-	MOHP
• Estimate, order, and maintain stocks of the most commonly used cold-chain spare parts	X	X	X	X	X	LMD
• Provide tool kits for maintenance to staff at new sub-centers	X	X	-	-	-	LMD
• Adopt an standard for budget allocation for cold chain and vaccine management (Procurement, Transport, Distribution, Repair and Maintenance)	X	X	X	X	X	MOHP
• Introduce and adopt national strategic guideline on cold chain and vaccine management system	X	X	X	X	X	LMD
• Monitor implementation SOPs on vaccine management at all levels	X	X	X	X	X	LMD, RHD
• Explore various methods of waste disposal	X	X	X			CHD, WHO, UNICEF

Strategy 2: Strengthen cold chain systems at all levels						
Key Activities	Timelines					Responsibility
	2011/12	2012/13	2013/14	2014/15	2015/16	
• Procure cold chain equipments and replace old equipment as per replacement plan	X	X	X	X	X	LMD
• Procure generators, hybrid & solar system for districts with poor electricity supply	5 EACH	10 EACH	10 EACH	-	-	LMD
• Coordinate with the bio-medical institute for maintenance of cold chain equipment	X	X	X	X	X	LMD
• Hire a biomedical refrigerator engineer	X	X	X	X	X	LMD
• Conduct quarterly supervisory visits by regional refrigerator technicians to their districts and by cold chain technicians to sub-centers.	X	X	X	X	X	LMD
• Establish CCE repair and maintenance workshop at central and regional level	-	X	X	X	-	LMD
• Procure fridge tag	50	50	50	100	100	LMD

Strategy 3: Increase the capacity of cold chain staff						
Key Activities	Timelines					Responsibility
	2011/12	2012/13	2013/14	2014/15	2015/16	
• Update, print and distribute training materials and guidelines for the basic operation, repair, and maintenance of cold chain equipment (SOPs)	X	X	-	-	-	LMD

Strategy 3: Increase the capacity of cold chain staff						
Key Activities	Timelines					Responsibility
	2011/12	2012/13	2013/14	2014/15	2015/16	
• Train basic-level staff to operate, repair, and maintain cold chain equipment at sub-centers	100	100	50	X	X	CHD, LMD
• Provide standardized supplies like temperature recording books, indent , maintenance and repair log books etc.	X	X	X	X	X	LMD

Objective 3: Maintain a polio-free status

Performance Indicators:

- Number of wild polio virus case reported
- Number of districts with certification standard AFP surveillance

Strategies, Key Activities, Timelines, Responsibilities:

Strategy 1: Achieve and sustain immunity levels to stop transmission of poliomyelitis						
Key Activities	Timelines					Responsibility
	2011/12	2012/13	2013/14	2014/15	2015/16	
• Strengthen routine OPV immunization (activities mentioned in objective 1)	X	X	X	X	X	CHD, Districts
• Conduct two rounds of NID with possibility of integration with other activities	X	X	X	-	-	MOHP, WHO, UNICEF

Strategy 1: Achieve and sustain immunity levels to stop transmission of poliomyelitis						
Key Activities	Timelines					
	2011/12	2012/13	2013/14	2014/15	2015/16	Responsibility
<ul style="list-style-type: none"> Initiate OPV birth dose in CBNCP districts 	X	X	X	X	X	CHD, Districts

Strategy 2: Respond adequately and timely to outbreak of poliomyelitis with appropriate vaccine						
Key Activities	Timelines					
	2011/12	2012/13	2013/14	2014/15	2015/16	Responsibility
<ul style="list-style-type: none"> Conduct Mop-up campaign in response to isolation of WPV/VPV with appropriate type of vaccine focusing on identification and reaching high risk population 	X	X	X	X	X	MOHP, WHO, UNICEF
<ul style="list-style-type: none"> Conduct cross border activities during SIAS 	X	X	X	X	X	CHD, WHO, UNICEF
<ul style="list-style-type: none"> Promote awareness on hygiene and sanitation activities in high risk districts in coordination with other stakeholders 	X	X	X	X	X	Districts, UNICEF

Strategy 3: Achieve and maintain certification standard AFP surveillance						
Key Activities	Timelines					
	2011/12	2012/13	2013/14	2014/15	2015/16	Responsibility
<ul style="list-style-type: none"> Intensify AFP surveillance activities in each district to meet certification standard 	X	X	X	X	X	Districts, WHO
<ul style="list-style-type: none"> Conduct quarterly meeting of certification committee 	X	X	X	X	X	NCCP, WHO

Strategy 3: Achieve and maintain certification standard AFP surveillance						
Key Activities	Timelines					
	2011/12	2012/13	2013/14	2014/15	2015/16	Responsibility
<ul style="list-style-type: none"> Implementation laboratory containment plan with review of implementation every 6 months 	X	X	X	X	X	LCC, WHO

Strategy 4: Develop post eradication strategic guideline						
Key Activities	Timelines					
	2011/12	2012/13	2013/14	2014/15	2015/16	Responsibility
<ul style="list-style-type: none"> Develop and implement post eradication strategic guideline 	-	-	X	X	X	CHD, WHO, UNICEF
<ul style="list-style-type: none"> Develop plan for transition of OPV to IPV after the eradication of poliomyelitis 	-	-	X	-	-	CHD, WHO

Objective 4: Maintain maternal and neonatal tetanus elimination status

Indicators:

- Percentage of TT2+ coverage for pregnant women
- Number of NT cases reported
- Number of districts reporting NT cases

Strategies, Key Activities, Timelines, Responsibilities:

Strategy 1: Achieve and maintain at least >80% TT 2+ coverage for pregnant women in each districts						
Key Activities	Timelines					Responsibility
	2011/12	2012/13	2013/14	2014/15	2015/16	
• Integrate and implement TT/Td immunization in BCC immunization strategy	X	X	X	X	X	CHD, UNICEF
• Develop, review and implement policy on TT 5 doses	X	X	X	X	X	CHD, FHD, WHO

Strategy 2: Conduct Td follow up campaign						
Key Activities	Timelines					Responsibility
	2011/12	2012/13	2013/14	2014/15	2015/16	
• Adopt standard tool to identify high risk districts for Td/TT campaign	X					CHD, UNICEF, WHO
• Conduct 2 rounds of Td campaign in women (10-29 years of age) in high risk districts	10 Districts	10 Districts	10 Districts	10 Districts	-	MOHP, UNICEF

Strategy 3: Continue NT surveillance						
Key Activities	Timelines					Responsibility
	2011/12	2012/13	2013/14	2014/15	2015/16	
• Continue NT surveillance	X	X	X	X	X	CHD, WHO
• Continue to review and verify cases reported through HMIS	X	X	X	X	X	Districts, WHO

Strategy 3: Continue NT surveillance						
Key Activities	Timelines					Responsibility
	2011/12	2012/13	2013/14	2014/15	2015/16	
• Review elimination status	X	-	-	-	X	CHD, WHO

Objective 5: Achieve measles elimination by 2016

Indicators:

- Percentage of district with measles coverage of >95%
- Measles incidence rate
- Elimination standard surveillance performance indicators

Strategies, Key Activities, Timelines, Responsibilities:

Strategy 1: Achieve and sustain immunity levels to reduce measles incidence to elimination level						
Key Activities	Timelines					Responsibility
	2011/12	2012/13	2013/14	2014/15	2015/16	
• Develop strategy guideline for measles elimination	X	-	-	-	-	CHD, WHO, UNICEF
• Achieve >95% coverage for MCV-1 (activities described in Objective 1)	X	X	X	X	X	CHD, Districts
• Provide second opportunity of measles vaccine through follow up campaign (MR) targeting children 9 months to under 15 years of age	X	-	-	-	-	CHD, Districts WHO, UNICEF,

Strategy 1: Achieve and sustain immunity levels to reduce measles incidence to elimination level						
Key Activities	Timelines					
	2011/12	2012/13	2013/14	2014/15	2015/16	Responsibility
• Conduct follow up MR campaign targeting children 9 months to under 5 years of age	-	-	-	-	X	CHD, Districts WHO, UNICEF
• Introduce second dose of measles vaccine in routine immunization	-	-	-	-	X	MOHP

Strategy 2: Investigate all suspected measles outbreaks with program response						
Key Activities	Timelines					
	2011/12	2012/13	2013/14	2014/15	2015/16	Responsibility
• Investigate all suspected measles outbreaks followed by appropriate response	X	X	X	X	X	Districts
• Distribute and implement case management protocol to all health facilities	X	X	X	X	X	CHD, WHO

Strategy 3: Expand measles case based surveillance						
Key Activities	Timelines					
	2011/12	2012/13	2013/14	2014/15	2015/16	Responsibility
• Expand case based surveillance sites based on elimination strategic guideline	X	X	X	X	X	Districts WHO
• Monitor HMIS for reporting of suspected measles cases reported from health facilities other than IPD reporting sites	X	X	X	X	X	District, WHO

Objective 6: Accelerate control of vaccine-preventable diseases through introduction of new and underused vaccine

Indicators:

- Number of new or underused vaccine introduced in national immunization program during cMYP period

Strategies, Key Activities, Timelines, Responsibilities:

Strategy 1: Introduction of new and under-used vaccines in NIP						
Key Activities	Timelines					Responsibility
	2011/12	2012/13	2013/14	2014/15	2015/16	
• Introduce rubella vaccine (as MR) in routine immunization	-	X	-	-	-	MOHP
• Introduce pneumococcal vaccine in routine immunization	-	-	-	X	-	MOHP, GAVI

Objective 7: Expand VPD surveillance with possibility of integration

Indicators:

- CRS & typhoid surveillance initiated

Strategies, Key Activities, Timelines, Responsibilities:

Strategy 1: Expand VPD surveillance						
Key Activities	Timelines					
	2011/12	2012/13	2013/14	2014/15	2015/16	Responsibility
• Continue integrated surveillance of AFP, measles, NNT and JE	X	X	X	X	X	Districts, WHO
• Initiate surveillance for CRS/rubella	-	X	X	X	X	CHD, WHO
• Initiate sentinel surveillance for typhoid and cholera	X	X	X	X	X	CHD, WHO
• Continue sentinel surveillance sites for pneumo and rota surveillance	X	X	X	X	X	CHD, WHO
• Conduct HepB sero survey	X	X	-	-	-	CHD, WHO

Strategy 2: Strengthen staff capacity to accommodate additional laboratory surveillance procedures						
Key Activities	Timelines					
	2011/12	2012/13	2013/14	2014/15	2015/16	Responsibility
• Establish sub-national level public laboratory capacity to support measles/rubella/JE and other VPDs	X	X	-	-	-	NPHL, WHO
• Continue to provide support for NPHL (test kits, reagents, additional staff and other support)	X	X	X	X	X	NPHL WHO
• Review of laboratory activities	X	X	X	X	X	NPHL, WHO
• Training of laboratory staff	X	X	x	x	x	NPHL, WHO

Strategy 3: Control of JE, CRS/Rubella and other VPDs						
Key Activities	Timelines					
	2011/12	2012/13	2013/14	2014/15	2015/16	Responsibility
• Develop and implement social mobilization and communication plan for strengthening JE routine immunization	X	X	X	X	X	CHD, NHEICC, WHO, UNICEF
• Introduce JE vaccine into routine immunization in post campaign districts	X	X	X	X	X	MOHP
• Continue to conduct JE campaign in high risk districts	5 Districts	5 Districts	-	-	-	CHD, Districts
• Continue surveillance of JE	X	X	X	X	X	CHD, WHO
• Conduct study of emergence of JE cases in campaign districts and develop control strategies accordingly	-	X	X	-	-	CHD, WHO
• Conduct campaign with rubella (MR) vaccine for all population from 9 months to 15 years of age	X	-	-	-	-	CHD, Districts
• Conduct follow up campaign with MR vaccine to all population from 9 months to 5 years of age	-	-	-	-	X	CHD, Districts

Objective 8: Continue to expand immunization services beyond infancy

Indicators:

- Number of districts with school immunization program

Strategies, Key Activities, Timelines, Responsibilities:

Strategy: 1 Expand school based immunization						
Key Activities	Timelines					Responsibility
	2011/12	2012/13	2013/14	2014/15	2015/16	
<ul style="list-style-type: none"> • Review phase wise introduction of school based Td immunization with inclusion of grade one and grade eight children in district with school health and nutrition program 	2 Districts	2 Districts	2 Districts	3 Districts	4 Districts	CHD

Chapter 5: Financial Planning

Future Resource Requirements and Program Financing, Gap Analysis for National Immunization program 2011-16

Health sector financing strategy

Development of the cMYP and its costing and financing is guided by the NSHP-II which is planned as a continuation of the reform agenda that has brought about the remarkable achievements of NHSP-1 in reducing under-five, infant and maternal mortality.

Financial Resource Envelope in Health Sector

There is considerable uncertainty over the future resources available for public expenditure on health. Three possible scenarios for the future growth in the resources available have been thus proposed: a 'low case,' a 'middle case,' and a 'high case.' These scenarios will be the basis for sequencing of future health sector development, including both the scaling up of existing interventions and the introduction of new ones. Decisions on introducing and scaling up interventions will in practice be made in the context of annual budget discussions, with a three-year perspective provided by the Medium-Term Expenditure Framework approved by the Ministry of Finance (MOF).

Costing of the National Immunization program

This section projects future costs (based on assumptions about the input required) and estimates and analyzes the gap between future resource requirements and available financing for National Immunization. The cMYP examines the current status of funding for the NIP and projects the future need. The baseline scenario is for the year 2010. The future projections are done for years, 2011-2015.

Currently the NIP focuses on eight primary series antigens: BCG, DPT-HepB-Hib, OPV, and Measles for under one year old children; JE for children aged 12-23 months and TT for women and school-going children in grade 1 along with proposed introduction of MR as MCV-1 in 2013, PCV-13 in 2013-2014 and Rotavirus vaccine in 2016. Similarly, the current NIP program envisions Polio NIDs, SNIDs and mop-ups up in 2012, MR campaign in 2012, gradually phased-in JE campaigns in 15 high-risk/endemic districts, school Td in selected districts and Td campaigns in selected high-risk districts.

In accordance with the Paris Declaration, the Accra Accord for Action and the IHP Nepal Compact, Nepal does have a mature SWAp since 2005 and a number of partners are progressively joining the pool-fund and currently World Bank, DFID, GAVI, AusAID are the major pool partners. The partners have also jointly agreed and signed a Joint Financial Agreement (JFA) and agreed on a Governance and Accountability Action Plan (GAAP) for harmonization and aid effectiveness.

Historically, the main multilateral agencies active in the NIP are UNICEF and WHO. The bilateral external development partners are JICA, USAID, DFID, GTZ, IFRC/Red

Cross of Nepal and Rotary International. In addition, various NGOs and INGOs are also supporting immunization program activities at the district level. At present most of EDP funds for health go directly to the MOHP or are self-executed by partners; the government has mandated that all the funds should be routed through the MOHP, so this proportion is likely to increase even further.

As long-term partners, WHO and UNICEF will continue to support the NIP. GAVI is expected to continue its support with Immunization Systems Strengthening, and introduction of underused and new vaccines.

The following were the main assumptions made in the preparation of this document:

- Total Health Expenditure (THE) per capita has been projected based on assumption of linear growth from the data of the last three years from World bank (2006-2009)
- Best estimates from 2009 for government health expenditure as percentage of THE has been considered because of unavailability of the most recent data
- Population projection and growth rate have been taken as estimated by HMIS for 2010.
- Costs of vaccines and logistics have been estimated from the UNICEF SD catalogue and from the GAVI estimates as provided in the cMYP forecast tool while for the cold-chain equipment the actual cost expenditure by government in the previous year has been kept for each item.
- Inflation rate for salary, price of vehicles and price of fuel have been taken as 2% which is the US dollar inflation rate
- Maintenance has been proposed at 5% of capital value of the equipment while vehicle maintenance has been proposed at 15% of the fuel costs.
- Average useful life year (ULY) of the vehicle has been considered as 10 years and for buildings 25 years.
- Average useful life year of cold chain equipment have been estimated to 8 years while for other capital equipment as 5 years.
- The unit cost for the following campaigns have been taken from the actual expenditures in the similar previous campaigns
 - Polio NID/SNID/Mop-up \$0.41
 - TT/Td Campaign \$0.40
 - School TD to Grade 1 & 8 \$0.40
 - JE Campaign \$0.35
 - Measles Rubella Campaign \$0.42
- The unit cost for the following line items have been taken from an average estimate of the analysis of 50 cMYPs of developing countries which are.
 - Short term training \$ 0.40
 - IEC/Social mobilization \$ 0.50
 - Disease surveillance \$ 0.80
 - Program management \$ 0.90

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 2010 was \$23,613,133 of which 58 percent was for routine immunization and 42 percent for campaigns. Campaigns conducted in 2010 were polio NIDs, SNIDs and multiple rounds of responsive mop-up polio campaigns as well as JE campaigns. 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 was about \$0.5, and the cost per DTP3 per child immunized was about \$27.3 in 2010. The table below presents the baseline indicators for 2010.

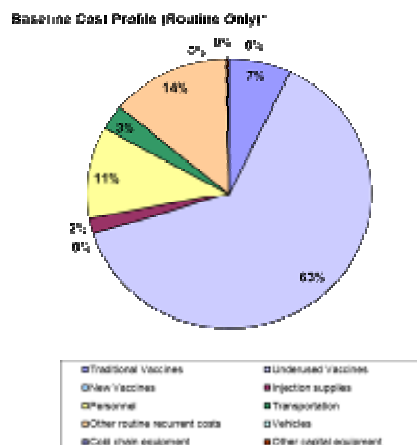
Table 8: Baseline costing for immunization 2010.

Baseline Indicators	2010
Total Immunization Expenditures	\$23,613,133
Campaigns	\$9,910,524
Routine Immunization only	\$13,702,609
per capita	\$0.5
per DTP3 child	\$27.3
% Vaccines and supplies	72.0%
% Government funding	34.0%
% Total health expenditures	1.9%
% Gov. health expenditures	5.4%
% GDP	0.04%
Total Shared Costs	\$7,300,872
% Shared health systems cost	24%
TOTAL	\$30,914,005

1. Baseline Cost Profile (Routine Only)

The pie chart presented here gives a breakdown of the total cost by items: as can be seen the bulk of the expenditure is for new vaccines (63%) and other routine recurrent costs (14%), followed by personnel costs (11%). Traditional vaccine costs were seven percent of the total routine immunization costs.

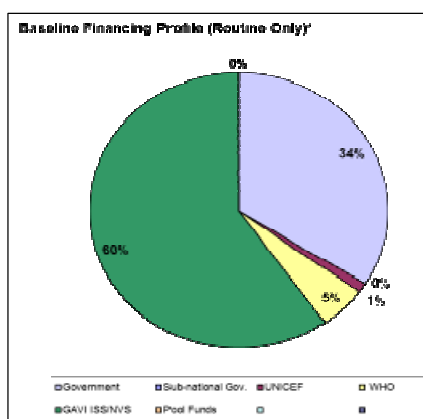
Figure 13: Baseline Cost profile of Routine Immunization



2. Baseline Sources of financing of immunization expenditure in 2010

The following pie chart indicates the major sources for immunization financing in 2010.

Figure 14: Baseline Financing profile of Routine Immunization



Currently, the GAVI vaccine fund remains the major contributor to immunization (60 percent), and contribution from the government of Nepal being the second largest (34%). WHO contributes 5 percent and UNICEF at around one percent of the total expenditure.

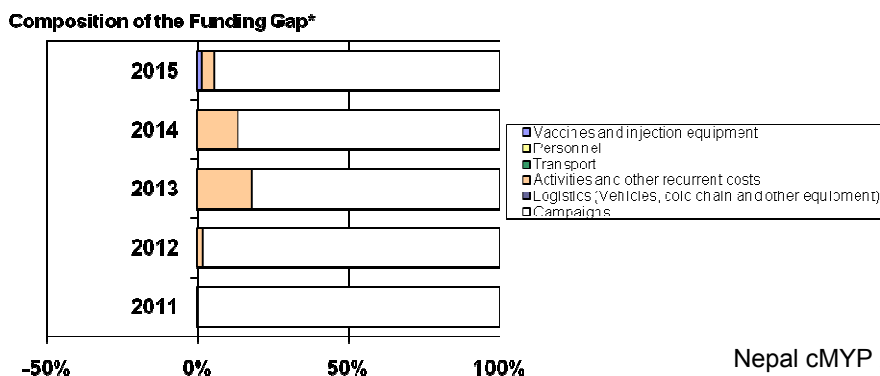
Future resource requirements, financing and gaps

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 total resource requirement for the cMYPA period was approximately USD 123,724,659 with cost per DPT3 targeted child being around \$24.2 excluding the shared system costs. With the shared cost of the system, the cost per DPT3 targeted child is around \$37.4.

Of the total requirement in Immunizations, 89% is for routine immunization and remaining for campaign activities. Around 52% of the resources required have been secured with a funding gap of around 48% of the total requirement. However considering the donor environment and the traditional commitments from partners, around half of the gap can probably be financed reducing to a funding gap of 21% including the probable funding. The major funding gap is in campaign activities. If both secure and probable sources are taken into account, the average funding gap is around 21%, almost all for the campaign activities. The major gap of 46% in 2012 is for the proposed MR campaign.

The funding gaps by composition are shown below

Figure 15: Composition fo Funding gap



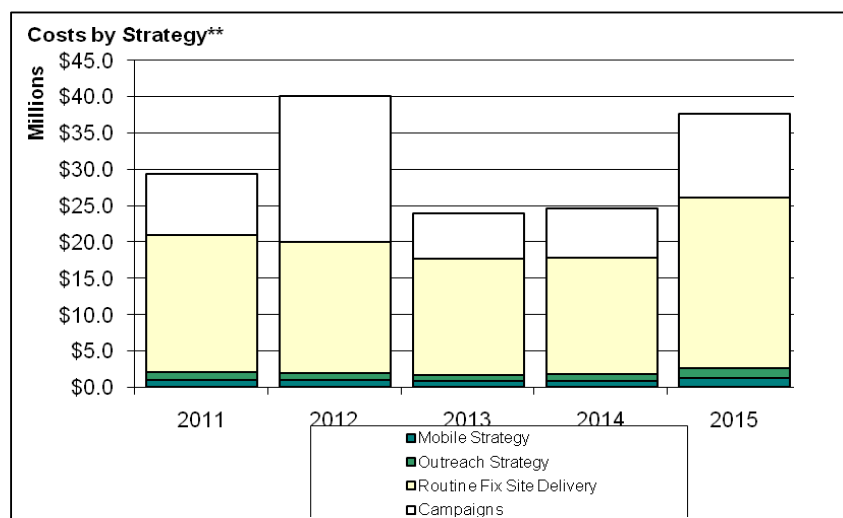
The table below gives the resource requirements, sources of funding, and the division of the funding sources between secure and probable funding excluding the shared cost of the health system.

Table 9: Immunization Resource requirement, Financing and gaps

Resource Requirements, Financing and Gaps*	2011	2012	2013	2014	2015	Avg. 2011 - 2015
Total Resource Requirements	\$20,990,117	\$30,170,994	\$16,316,999	\$24,958,349	\$31,288,200	\$123,724,659
Total Resource Requirements (Routine)	\$20,095,397	\$17,751,192	\$17,906,662	\$26,188,698	\$27,884,031	\$109,825,981
per capita	\$0.5	\$0.4	\$0.3	\$0.6	\$0.6	\$0.5
per DTP targeted child (without shared cost)	\$23.7	\$18.0	\$17.3	\$29.9	\$30.6	\$24.2
per DTP targeted child (with shared cost)	\$37.7	\$31.6	\$30.6	\$42.9	\$43.1	\$37.4
Total Secured Financing	\$13,679,576	\$11,869,404	\$12,176,891	\$13,245,290	\$13,850,636	\$64,821,798
Government	\$6,407,736	\$8,358,519	\$9,548,265	\$8,974,552	\$9,560,911	\$42,849,983
UNICEF	\$23,416	\$16,789				\$40,205
WHO	\$784,764	\$805,566	\$847,884	\$966,693	\$725,822	\$4,130,730
GAVI ISS/NVS	\$6,463,660	\$2,688,530	\$1,780,742	\$3,304,045	\$3,563,903	\$17,800,880
Funding Gap (with secured funds)	\$7,310,541	\$18,301,590	\$4,140,108	\$11,713,058	\$17,437,564	\$58,902,861
% of Total Needs	35%	61%	25%	47%	56%	48%
Total Probable Financing	\$4,172,881	\$4,552,214	\$2,769,521	\$10,279,797	\$11,692,531	\$33,466,943
Government	\$108,000	\$601,909	\$324,891	\$366,291	\$705,738	\$2,106,828
UNICEF	\$2,941,511	\$2,894,234	\$1,792,294	\$1,681,798	\$1,747,441	\$11,057,278
WHO	\$1,123,370	\$1,056,071	\$652,336	\$621,993	\$741,558	\$4,195,328
GAVI ISS/NVS				\$7,609,715	\$8,497,794	\$16,107,509
Funding Gap (secured & probable)	\$3,137,660	\$13,749,377	\$1,370,587	\$1,433,262	\$5,745,033	\$25,435,918
% of Total Needs	15%	46%	8%	6%	18%	21%

An analysis of the cost by strategies for immunization shows that most of the cost is required to run the fixed (static clinic) sites of the immunization program. However, campaigns also take a significant bulk of the total resources required for the immunization program.

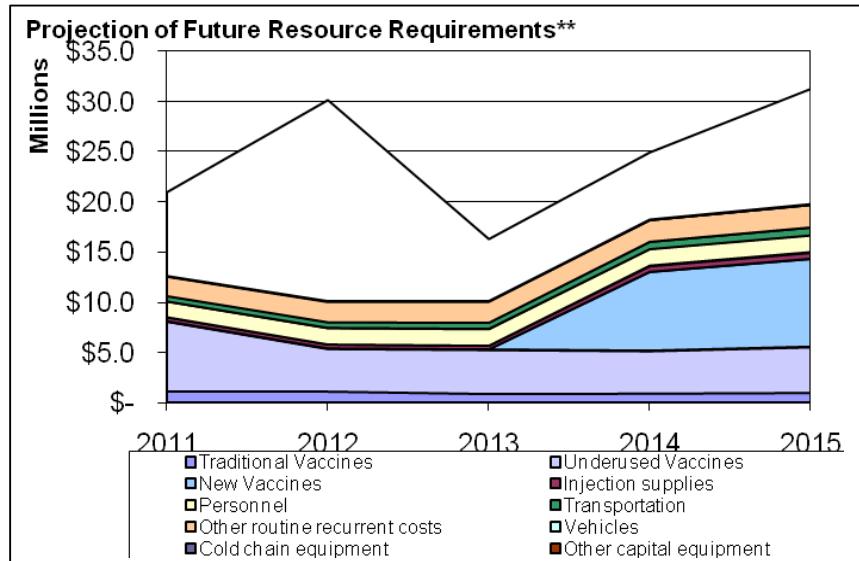
Figure 16: Cost of immunization program by Strategy



The secured funding sources are the government of Nepal, and GAVI, all other sources are probable. The government of Nepal procures all of the traditional vaccines and GAVI has ensured support for underused vaccine DPT-HepB-Hib up to 2015.

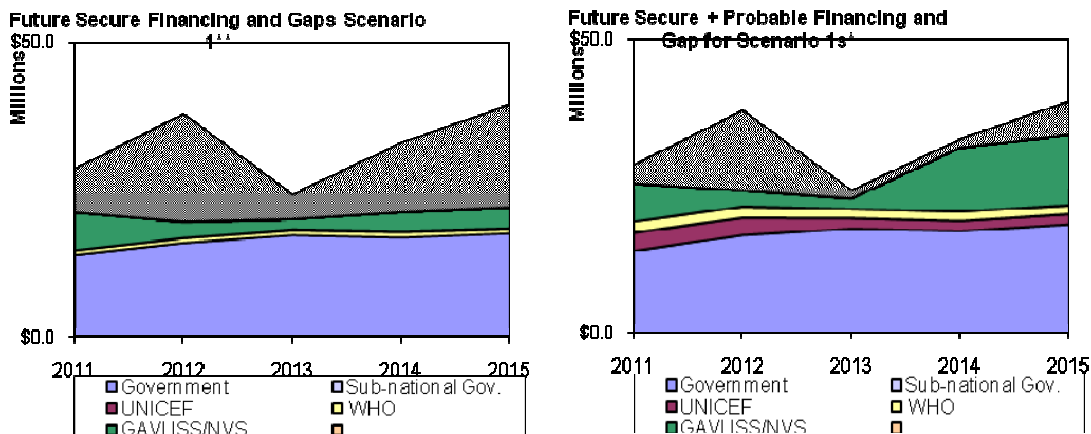
The figure below indicates the major future resource requirement for the period 2011-15. The major future resources requirement is for MR Campaign in 2012 and thereafter for the introduction of new vaccine PCV-13 as evident from the graph below:

Figure 17: Projection fo future resource requirements



The following graphs indicate the projections for future secure financing gaps and future secure plus probable financing gaps:

Figure 18: Future resource requirement , gaps and scenario: With Secured funding and probable funding.



Macro Economics and Sustainability Plan for Immunization program

The macro-economic and sustainability indicators show that the government has secured funding for routine immunization and is almost self-sustainable. However the sustainability for campaign costs should be evaluated and external resources leveraged for the campaigns for elimination and eradication activities. The funding gap as percent of government health expenditures with secured as well as probable funds is around 2% for the entire cMYP period with highest (5%) in 2012 because of the measles campaign. However, the gap is more if only secured funds are considered and is around 5%.

The following table demonstrates the sustainability and macro-economic indicators projected for the period 2010-2016 excluding the shared system costs.

Table 10: Sustainability and Macro-Economics Indicators projected for 2010-2015.

Macroeconomic and Sustainability Indicators	2010	2011	2012	2013	2014	2015
Reference						
Per capita GDP (\$)	\$1,250	\$1,303	\$1,358	\$1,420	\$1,492	\$1,577
Total health expenditures per capita	\$26.0	\$27.0	\$28.0	\$29.0	\$30.0	\$31.0
Population	27,498,585	28,087,055	28,688,118	29,302,043	29,929,107	30,569,590
GDP (\$)	\$34,372,406,292	\$36,600,521,875	\$38,946,127,932	\$41,610,952,783	\$44,666,498,783	\$48,214,663,092
Total Health Expenditures	\$714,963,210	\$758,350,477	\$803,267,295	\$849,759,259	\$897,873,214	\$947,657,291
Government Health Expenditure	\$252,382,013	\$267,697,719	\$283,553,355	\$299,965,018	\$316,949,245	\$334,523,024
% Total Health Expenditures						
Resource Requirements for Immunization						
Routine and Campaigns	3.4%	2.8%	3.9%	2.0%	2.9%	3.4%
Routine Only	2.0%	1.7%	1.4%	1.3%	2.1%	2.2%
Funding Gap						
Secure Funds Only		1.0%	2.4%	0.6%	1.4%	2.0%
Secure and Probable		0.5%	1.8%	0.3%	0.3%	0.7%
% Government Health Expenditures						
Resource Requirements for Immunization						
Routine and Campaigns	9.6%	8.1%	10.9%	5.7%	8.2%	9.7%
Routine Only	5.6%	5.0%	3.8%	3.7%	6.1%	6.2%
Funding Gap						
Secure Funds Only		3.0%	6.7%	1.7%	4.0%	5.5%
Secure and Probable		1.4%	5.1%	0.8%	0.8%	2.0%
% GDP						
Resource Requirements for Immunization						
Routine and Campaigns	0.07%	0.06%	0.08%	0.04%	0.06%	0.07%
Routine Only	0.04%	0.04%	0.03%	0.03%	0.04%	0.04%
Per Capita						
Resource Requirements for Immunization						
Routine and Campaigns	\$0.88	\$0.77	\$1.08	\$0.59	\$0.87	\$1.06
Routine Only	\$0.52	\$0.47	\$0.38	\$0.38	\$0.64	\$0.68

The vaccine costs become the largest component of the NIP expenditures, overtaking personnel costs and accounting for more than two-thirds of total immunization costs. Adequate and secured financing is required to ensure continuous increases in coverage, quality, safety and access to both traditional and newer vaccines and hence ensure equity in utilization. Fiscal space for immunization can be enlarged by forging alliance among Ministry of Health, Ministry of Finance and Parliament. Collective action among these key national institutions and partners will strengthen good communication and it will help explore innovative approaches for financing national immunization system. The options for dealing with these funding risks are:

- f) With increasing government fiscal space the immunization program will get increased share
- g) Accelerating the potential improvements in program efficiency
- h) Reviewing objectives and possibly reducing the speed in which improvements are planned for introduction
- i) Exploring various additional funding resources (domestic private and public as well as external partners)
- j) Establishment of Immunization Trust Fund as directed by the parliament

The analysis of the cost of immunization services undertaken suggests that the total cost is beyond the official NIP budget. However with a mature SWAP mechanism and signing of the Nepal Health Development Partnership (IHP+ Nepal compact), the health fiscal space is expected to increase as per the “medium case scenario” to ensure and commit more funds for Routine immunization program.

Although the analysis suggests some real risks 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.

Conclusions

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

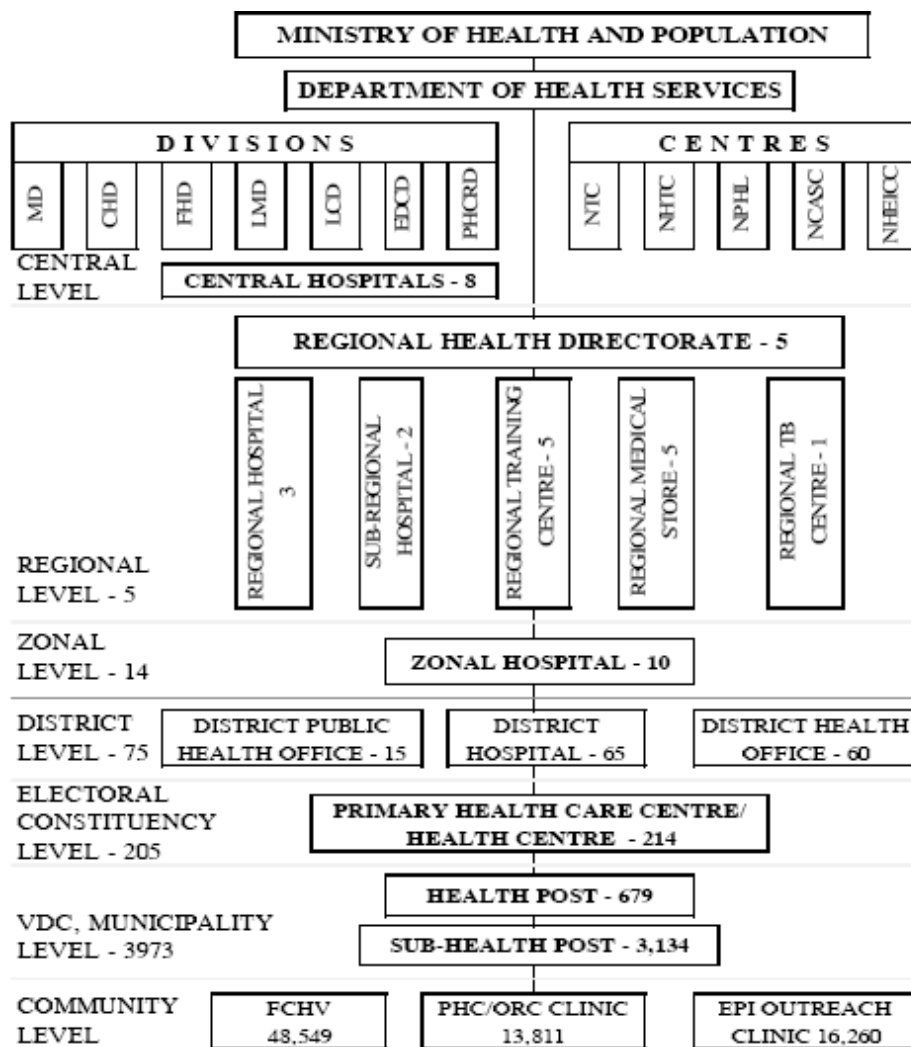
1. The total resource requirement for the cMYPA period was approximately USD 123,724,659 with cost per DPT3 targeted child being around \$24.2 excluding the shared system costs. With the shared cost of the system, the cost per DPT3 targeted child is around \$37.4.
2. The total resource requirements increase in 2011 and 2012 but then gradually decrease in 2013 and 14 with a rise in 2015. The huge increase in 2012 is due to proposed nation-wide MR campaign for a wide age-group from 9 months to 15 years. Similarly, the year 2014 shows fewer resources required than 2012 because from 2014 only polio NIDs will be conducted and no SNIDs have been

proposed. However, the funds required for 2015 increases again because of the proposed MR follow up campaign for the age group 9 months to 5 years.

3. The per capita resource requirements decreases to \$0.4 in 2012 compared to \$0.5 in 2011 and then rises to \$0.6 in 2014 and remains constant for the remaining years averaging to \$0.5 for the cMYP period.
4. Routine static site activities comprise the biggest source of costs, along with the campaigns.

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, PCV-13) and for conducting Supplemental Immunization Activities for polio eradication and measles elimination. The overall size of the gap increases over time as the contributions from other partners are no longer defined as probable. The long-term projection and commitment is difficult to obtain. Also the cost of vaccines increases quite sharply post 2012 with the introduction of newer vaccines such as PCV-13. The vaccine costs become the largest component of the NIP expenditures, overtaking personnel costs and accounting for more than two-thirds of total immunization costs.

Annex 1: MOHP Organizational Structure



Acronyms

MD	Management Division
NTC	National Tuberculosis Centre
FHD	Family Health Division
NCASC	National Centre for AIDS and STD Control
CHD	Child Health Division
NPHL	National Public Health Laboratory
EDCD	Epidemiology and Disease Control Division
FCHV	Female Community Health Volunteer
LMD	Logistics Management Division
PHC/ORC	Primary Health Care Outreach Clinic
LCD	Leprosy Control Division
EPI	Expanded Programme on Immunisation
NHTC	National Health Training Centre
NHEICC	National Health Education, Information and Communication Centre

Annex 2: Annual Work Plan 2011-2012 FY

Objective 1: Achieve and maintain at least 90% coverage of all antigens at national and district level by 2016																			
Activities	Timeline												Responsible	Total Costs NPR	Funding Available		Shortfall	Remarks	
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun			Govt.	Partners			
Review and finalize RED micro planning guideline and training materials	X	X												CHD, WHO, UNICEF	831,000		831,000	0	WHO
Conduct MToT for RED micro planning	X	X	X											CHD,WHO	1,000,000		1,000,000	0	WHO
Conduct RED micro planning (using CBCNP denominator)		X	X	X	X	X	X	X	X	X				Districts	6,000,000		6,000,000	0	3,500,000-UNICEF, 2,500,000-WHO
Review implementation of micro planning in those districts that have completed RED micro planning				X	X	X	X	X	X	X	X	X		CHD, Districts	0			0	
Develop strategy for integration of immunization with other child health and family health activities	X	X												CHD, WHO, UNICEF	500,000		500,000	0	WHO
Periodic intensification of RI through immunization month	X	X	X	X	X	X	X	X	X	X	X	X		Districts	0			0	

Objective 1: Achieve and maintain at least 90% coverage of all antigens at national and district level by 2016																			
Activities	Timeline												Responsible	Total Costs NPR	Funding Available		Shortfall	Remarks	
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun			Govt.	Partners			
Revise, develop, print and distribute training materials on immunization (Flip chart and others)		X	X	X										CHD, WHO, UNICEF	2,300,000	1,800,000	500,000	0	UNICEF
Revise, develop, update and distribute policy and strategy document on immunization (MLM, IIP, cMYP)					X	X								CHD, WHO, UNICEF	1,000,000		1,000,000	0	WHO
Conduct MLM training			X						X					CHD	1,600,000		1,600,000	0	800,000-UNICEF 800,000-WHO
Peer exchange visits									X	X				CHD	1,000,000	1,000,000		0	
ICC, NCIP and AEFI committees meetings	X	X	X	X	X	X	X	X	X	X	X	X		CHD WHO	600,000		600,000	0	WHO
Restructuring of NIP									X	X	X			MOHP	0			0	
Hiring of vaccinators		X	X	X										DoHS	60,000,000	60,000,000		0	
Revise, develop and print guidelines, checklists and reporting formats for integrated child health review meetings at each level		X	X											CHD	100,000		100,000	0	UNICEF

Objective 1: Achieve and maintain at least 90% coverage of all antigens at national and district level by 2016																		
Activities	Timeline												Responsible	Total Costs NPR	Funding Available		Shortfall	Remarks
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun			Govt.	Partners		
Conduct monthly review meetings at the health facility level				X				X				X	Districts	0			0	MD
Conduct monthly review meetings at the Ilaka level				X				X				X	HF	0			0	MD
Share and review annual plan with EPI partners and ICC members		X				X				X			CHD, Districts	0			0	
Conduct c MYP implementation review						X	X						CHD RHD	200,000		200,000	0	UNICEF
Review, finalize and implement RI BCC strategy	X	X											CHD, WHO, UNICEF	100,000		100,000	0	UNICEF
Develop an innovative district-specific social mobilization plan using local resources and funding from NHEICC					X	X							Districts	0			0	NHEICC
Revise strategy and policy and conduct National Immunization Month								X					CHD, WHO, UNICEF	5,500,000	5,500,000		0	
Initiate a continuous mass media communications campaign that utilizes a variety of messages	X	X	X	X	X	X	X	X	X	X	X	X	CHD, NHEICC, UNICEF	1,500,000		1,500,000	0	UNICEF
Provide computers to EPI section in districts						X	X						LMD	0			0	LMD

Objective 1: Achieve and maintain at least 90% coverage of all antigens at national and district level by 2016																			
Activities	Timeline												Responsible	Total Costs NPR	Funding Available		Shortfall	Remarks	
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun			Govt.	Partners			
Conduct RED micro planning in municipalities in coordination and collaboration with urban health program			X		X	X	X	X						Districts	0			0	PHCRV
Develop and implement an immunization policy and guidelines for the municipalities					X	X								RVD, WHO, UNICEF	0			0	PHCRV
Review and monitor implementation of micro plan in municipalities that have completed micro planning				X	X	X	X	X	X	X	X	X		CHD, RVD, Districts	0			0	PHCRV, WHO
Review and update tools for supervision and monitoring														CHD, WHO UNICEF	100,000		100,000	0	WHO
Conduct a minimum of two joint (government + partners) supervisory visits in a year from the central office to low performing districts using the tools					X				X					CHD, WHO, UNICEF	2,000,000	2,000,000		0	
Conduct a minimum of three joint (government + partners) supervisory visits in a year to health facilities, VDC and immunization session		X				X				X				CHD, WHO, UNICEF	0			0	

Objective 1: Achieve and maintain at least 90% coverage of all antigens at national and district level by 2016																		
Activities	Timeline												Responsible	Total Costs NPR	Funding Available		Shortfall	Remarks
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun			Govt.	Partners		
Conduct at least one supervisory visit from district headquarters to all VDCs and immunization session and at least two visits (integrated)	X	X	X	X	X	X	X	X	X	X	X	X	Districts	57,180,000	57,180,000		0	
Advocacy meeting with MoF, law makers, policy makers, planners and other stakeholders to ensure availability of funds as per cMYP		X					X						MOHP	350,000		350,000	0	SABIN
Explore establishing "National Immunization Trust Fund"		X	X										MOHP	200,000	200,000		0	
TOTAL																		

Objective 2: Ensure access to vaccine of assured quality and with appropriate waste management																		
Activities	Timeline												Responsible	Total Costs NPR	Funding Available		Shortfall	Remarks
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun			Govt.	Partners		
Review and implement the policy for forecasting, procuring, storing and distributing vaccines and related logistics (multi-year procurement)	X	X											CHD, LMD	0			0	

Objective 2: Ensure access to vaccine of assured quality and with appropriate waste management																			
Activities	Timeline												Responsible	Total Costs NPR	Funding Available		Shortfall	Remarks	
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun			Govt.	Partners			
Provide tool kits for maintenance to staff at new sub-centers						X	X	X						LMD	0			0	
Introduce and adopt national strategic guideline on cold chain and vaccine management system			X	X	X									LMD	150,000		150,000	0	UNICEF
Monitor implementation SOPs on vaccine management at all levels		X	X	X	X	X	X	X	X	X	X	X		LMD, RHD	0			0	
Procure cold chain equipments, spare parts and replace old equipment as per replacement plan						X	X							LMD	22,100,000	22,100,000		0	
Procure generators, solar freeze, hybrid system for districts with poor electricity supply						X	X							LMD	9,300,000	9,300,000		0	
Conduct AEFI trainings to health staff	X	X	X											CHD WHO	2,100,000		2,100,000		WHO
Hire a biomedical refrigerator engineer and computer operator and CCC						X	X							LMD	810,000	810,000		0	

Objective 2: Ensure access to vaccine of assured quality and with appropriate waste management																			
Activities	Timeline												Responsible	Total Costs NPR	Funding Available		Shortfall	Remarks	
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun			Govt.	Partners			
Conduct quarterly supervisory visits by regional refrigerator technicians to their districts and by cold chain technicians to sub-centers.		X			X			X				X		LMD	0			0	LMD budget
Procure fridge tag, data loggers						X								LMD	3,100,000	3,100,000		0	
Update, print and distribute training materials and guidelines for the basic operation, repair, and maintenance of cold chain equipment (SOPs)	X	X	X	X	X	X	X	X	X	X	X	X	X	LMD	3,375,000		3,375,000	0	UNICEF
Train basic-level staff to operate, repair, and maintain cold chain equipment at sub-centers		X	X											CHD, LMD	851,000		851,000		WHO
Conduct EVSM	X	X	X											CHD UNICEF WHO	500,000		500,000		UNICEF
Procurement of vaccines and accessories for routine and campaign					X	X	X							CHD LMD	172,962,000	172,962,000		0	
Government penta co finance				X	X	X								DoHS	30,000,000	30,000,000		0	
Procurement OPV for campaign					X	X								CHD UNICEF	132,000,000		132,000,000		UNICEF

Objective 2: Ensure access to vaccine of assured quality and with appropriate waste management																		
Activities	Timeline												Responsible	Total Costs NPR	Funding Available		Shortfall	Remarks
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun			Govt.	Partners		
Transportation vaccine within districts	X	X	X	X	X	X	X	X	X	X	X	X	Districts	30,000,000	30,000,000		0	
TOTAL																		

Objective 3: Maintain a polio-free status																		
Activities	Timeline												Responsible	Total Costs US\$	Funding Available		Shortfall	Remarks
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun			Govt.	Partners		
Conduct two rounds of NID with possibility of integration with other activities								X	X				CHD, WHO, UNICEF	188,500,000	54,000,000	134,500,000	130,500,000	WHO-130,500,000, UNICEF-40,000,000
Introduce OPV birth dose in CBNCP districts		X	X	X	X	X	X	X	X	X	X	X	CHD Districts	0			0	
Conduct Mop-up campaign in response to isolation of WPV/VDPV with appropriate type of vaccine													CHD, WHO, UNICEF	75,000,000		75,000,000	75,000,000	WHO
Awareness on hygiene and sanitation activities in high risk districts in coordination with other stakeholders													Districts, UNICEF	300,000		300,000	0	UNICEF

Objective 3: Maintain a polio-free status																			
Activities	Timeline												Responsible	Total Costs US\$	Funding Available		Shortfall	Remarks	
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun			Govt.	Partners			
Intensify AFP surveillance activities in each district to meet certification standard	X	X	X	X	X	X	X	X	X	X	X	X	X	WHO	50,000,000		50,000,000	0	WHO
Conduct quarterly meeting of certification committee			X				X						X	CHD, WHO	200,000		200,000	0	WHO
Implementation laboratory containment plan with review of implementation every 6 months			X							X				NPHL	200,000		200,000	0	WHO
TOTAL																			

Objective 4: Maintain maternal and neonatal tetanus elimination status																			
Activities	Timeline												Responsible	Total Costs NPR	Funding Available		Shortfall	Remarks	
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun			Govt.	Partners			
Integrate and implement TT/Td immunization BCC strategy in immunization BCC strategy	X	X	X											CHD, NHEICC, UNICEF	0			0	
Develop, review and implement policy on TT 5 doses		X	X											CHD, FHD, WHO	500,000		500,000	0	WHO

Objective 4: Maintain maternal and neonatal tetanus elimination status																			
Activities	Timeline												Responsible	Total Costs NPR	Funding Available		Shortfall	Remarks	
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun			Govt.	Partners			
Conduct 2 rounds of Td campaign in women (10-29 years of age)					X	X								CHD, Districts, UNICEF	22,014,000		22,014,000	0	UNICEF
Reevaluate elimination status		X	X											CHD, WHO	0			0	
TOTAL																			

Objective 5: Achieve measles elimination by 2016																			
Activities	Timeline												Responsible	Total Costs NPR	Funding Available		Shortfall	Remarks	
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun			Govt.	Partners			
MR campaign (children 9 months to < 15 years of age)							X	X						DoHS,WHO UNICEF	732,142,000	332,142,000		400,000,000	WHO, UNICEF
Develop strategy guideline for measles elimination	X	X												CHD WHO	200,000		200,000	0	WHO
Investigate all suspected measles outbreaks followed by surveillance and immunization response	X	X	X	X	X	X	X	X	X	X	X	X		Districts WHO	2,800,000		2,800,000	0	WHO
Distribute case management protocol to all health facilities		X	X	X										CHD WHO	200,000		200,000	0	WHO
Expand case based surveillance sites based on elimination strategic guideline			X	X	X	X	X	X	X	X	X	X		Districts WHO	2,800,000		2,800,000	0	WHO
TOTAL																			

Objective 7: Expand VPD surveillance with possibility of integration																		
Activities	Timeline												Responsible	Total Costs NPR	Funding Available		Shortfall	Remarks
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun			Govt.	Partners		
Continue integrated surveillance of AFP, measles, NNT and JE	X	X	X	X	X	X	X	X	X	X	X	X	Districts WHO	35,500,000		35,500,000	35,500,000	WHO
Initiate sentinel surveillance for typhoid		X	X										WHO	2,100,000		2,100,000	0	WHO
Continue sentinel surveillance sites for pneumo and rota surveillance	X	X	X	X	X	X	X	X	X	X	X	X	SEARO	0			0	WHO SEARO
Conduct HepB sero survey								X	X	X			WHO	1,500,000		1,500,000	0	WHO
Establish sub-national level public laboratory capacity to support measles/rubella/JE and other VPDs			X		X	X							NPHL WHO	500,000		500,000	0	WHO
Continue to provide support for NPHL (test kits, reagents, additional staff and other support)	X	X	X	X	X	X	X	X	X	X	X	X	NPHL WHO	1,500,000		1,500,000	0	WHO
Training of laboratory staff										X	X	X	NPHL WHO	500,000		500,000	0	WHO
Develop and implement social mobilization and communication plan for strengthening JE routine immunization	X	X	X	X	X	X	X	X	X	X	X	X	CHD, NHEICC	1,000,000	1,000,000		0	
Introduce JE vaccine into routine immunization in post campaign districts	X	X	X	X	X	X	X	X	X	X	X	X	DoHS	0			0	
Conduct JE campaign in high risk districts									X	X				10,800,000	10,800,000		0	
TOTAL																		

Objective 8: Continue to expand immunization services beyond infancy																				
Activities	Timeline												Responsible	Total Costs NPR	Funding Available		Shortfall	Remarks		
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun			Govt.	Partners				
Review and Expand school based Td immunization with inclusion of grade one and grade eight children in district with school health program											X	X		CHD Districts	16,000,000	16,000,000		0		
TOTAL																				