Ministry of Health Viet Nam

National Expanded Program on Immunization

Comprehensive Multi-Year Plan

cMYP for Extended Program on Immunization 2016-2020

Ha Noi, August 2015

Contents

Acronyms

AEFI	Adverse Events Following Immunization
AD syringes	Auto-Disabled Syringes
BCG	Bacille-Calmette Guerine Vaccine
c-VDPV	Circulating-Vaccine derived polio virus
CBAW	Women in Child-bearing age group
DTP	Diphtheria -tetanus-pertussis vaccine
DTP3	Third dose of DTP vaccine
EPI	Expanded Program on Immunization
HepB3	Third dose of hepatitis B vaccine
HPV	Human Papillomavirus
HW	Health Workers
GAVI Alliance	Global Alliance for Vaccines and Immunization
GIVS	Global Immunization Vision and Strategy
HCWs	Health community workers
ICC	Interagency Coordination Committee
IEC	Information Education Communication
IPV	Inactivated polio vaccine
JE	Japanese Encephalitis
JICA	Japan International Cooperation Agency
MNTE	Maternal and Neonatal Tetanus
MSV1	Measles vaccine first dose
MSV2	2nd dose of measles vaccine
MR	Measles-Rubella combination vaccine
NRA	National Regulatory Authority
NEPI	National Expanded Program on Immunization
OPV	Oral Polio Vaccine
OPV3	Third dose of OPV vaccine
PATH	Program for Appropriate technologies in Health, an international NGO
PCV	Pneumococcal Conjugate Vaccine
SIA	Supplementary Immunization Activity
SNID	Sub-national Immunization Days
VPD	Vaccine Preventable Diseases
VHWs	Village Health Workers
UNICEF	United Nations Children Fund
WHO	World Health Organization

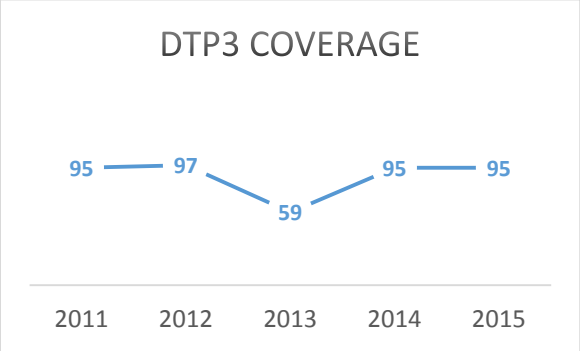
Executive Summary

IMMUNIZATION SITUATIONAL

Immunization Achievements

1. DPT coverage - 95%
2. Coverage of fully immunized children - 75.6%
3. DPT1 – DPT3 drop out 7.7%
4. 94% of districts with above 80% of DPT3 coverage
5. Polio coverage – 96%
6. Service delivery strategy is developed
7. Recurrent budget for EPI staff salaries
8. Functional AFP surveillance system

Immunization Coverage



Immunization System Analysis

1. Immunization services are available at all levels and functioning through well-established provider network
2. Coverage is not uniformly high among some population groups
3. Outreach services targeting hard-to-reach populations stopped in some districts
4. Existence of non-EPI immunization system with different immunization schedule

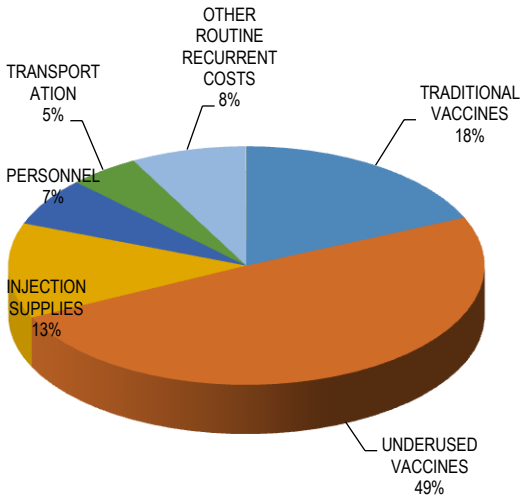
Health System Constraints

1. Overall investment on EPI is insufficient at all levels
2. Limited outreach and mobile activities
3. High staff turnover and new staff
4. Multiple tasked staff beyond EPI and lack of time for regular supervision aditional burden of health staff
5. Inequitable distribution of vaccinators

Baseline Costing Profile

Indicators	2014
Total Immunization Expenditures ($)	$60,905,828
Campaigns ($)	$33,796,428
Routine Immunization only ($)	$27,109,400
per capita ($)	$0.30
per DTP3 child ($)	$16
% Vaccines and supplies	80.8%
% Government funding	61.1%
% Total health expenditures	0.3%
% Gov. health expenditures	0.6%
% GDP	0.01%
Total Shared Costs ($)	$17,804,601
% Shared health systems cost	22.6%
TOTAL	$78,710,429

Baseline Financing Profile



ANALYSIS SUMMARY

cMYP SUMMARY 2016 – 2020

Immunization Priorities

1. Polio eradication
2. Measles and Rubella elimination
3. Hepatitis B accelerated control
4. Accelerated control of Japanese Encephalitis
5. Meeting regional vaccination coverage rates
6. Immunization of populations in hard to reach areas
7. Improve cold chain equipment
8. Introduce IPV and Rota

Immunization Goals and Objectives

1. Maintain polio free status
2. Control diphtheria and pertussis
3. Eliminate measles and rubella
4. Control Hepatitis B
5. Reaching over 90% coverage of three doses of JE
6. Maintain more than 95% coverage rates for all antigens at national level and DTP3 coverage of 90% in all districts
7. Reach over 90% coverage of fully immunized children

Monitoring Framework

Indicator	2012	2018
Cases of measles per million population (#)	218	55
Cases of polio (#)	4	0
Neonatal deaths per 100,000 newborns (#)	1.8	0.5
DPT3 coverage (%)	39	85
% pregnant women have TT2	54	65
% Children fully immunized	29	80
% District with 80% DPT3 coverage	33	75
% dropout between DPT1 – DPT3	26	28
PCV3 coverage (%)	0	85

Priority Immunization Program Strategies

1. Reaching over 90% coverage of FIC for children under 1 years of age
2. Reaching over 90% coverage for JE3 among 2-5 year old children
3. Measles elimination by 2017
4. Accelerated control of Hepatitis B
5. Control of diphtheria and pertussis
6. Vaccination of children in high-risk areas with cholera and typhoid vaccine
7. Implementation of JE SIA in the high risk areas
8. Elaborate specific urban EPI communication strategy

Sustainability Strategy

1. Planning and implementation of resource mobilization strategy
2. Development of effective communication plan
3. Development and implementation of program advocacy plan
4. Revision of some targets as planned

Health and Development Impacts

1. Contribution in achievement of MDG Goal 5 through improved child survival
2. Reduced disability in the community associated with vaccine preventable disease

Cost and Financing Projections (US$)

	2014	2015	2016	2017	2018
Total resources required (US$ million)	**$64.3**	**$85.3**	**$71.6**	**$71.6**	**$72.0**
Cost per capita (in US$)	$0.47	$0.68	$0.54	$0.53	$0.53
Total secure financing (US$ million)	$47.4	$60.1	$59.8	$57.9	$58.3
Funding Gap (with secure) (US$ million)	**$16.9**	**$24.7**	**$11.8**	**$13.6**	**$13.7**
Total probable financing (US$ million)	**$16.10**	**$27.00**	**$22.70**	**$19.70**	**$19.50**
Funding Gap (with secured funds only) (US$ million)	**$16.9**	**$24.7**	**$11.8**	**$13.6**	**$13.7**
Per centage of funding gap	26%	29%	16%	19%	19%
Total resources required (US$ million)	**$64.3**	**$85.3**	**$71.6**	**$71.6**	**$72.0**
Cost per capita (in US$)	$0.47	$0.68	$0.54	$0.53	$0.53

1. Situational Analysis

1.1. Country Profile

Viet Nam (population 91.6 million) in recent years has experienced steady rates of economic growth and social development.

The country is divided into 6 major geographical zones, including the Red River Delta, Northern midlands and mountain areas, the North Central and Central Coastal areas, Central Highlands, South East and the Mekong River Delta. The rapidly growing urban centers of Hanoi in the north (population 7.3 million), and Ho Chi Minh City in the south (population 7.9 million) could be considered as an additional highly urbanized ecological zone.

The country is divided administratively into 4 regions, 63 Provinces, 704 Districts, and 11,138 Communes. The health sector structure conforms to the administrative structures with a network of National Hospitals, Provincial and District Preventive centers, and Commune Health centers, which are further networked by a system of village health workers.

Table 1 Basic Demographic Indicators Viet Nam

Total population (2013)	91,680,000
Population Under 15	23%
Population Urbanised	32%
Gross national income per capita (PPP international $, 2013)	5,030
Life expectancy at birth m/f (years, 2013)	71/80
Total expenditure on health per capita (Intl $, 2013)	308
Total expenditure on health as % of GDP (2013)	6.0
Total Fertility rate	1.7
Under-five mortality rate (per 1000 live births)	24
Maternal mortality ratio (per 100 000 live births)	49

Viet Nam adopted a state funded health sector, with a recent administrative decree establishing free health care services for all children in Viet Nam under the age of six. 92% of deliveries take place in facilities.[1] The country is also in the formative period of development of a nationwide health insurance system. In 2011 there were 13,506 health service facilities in the country. Viet Nam's health system is highly decentralized, with 93.9% of all facilities under the authority and management of local health authorities.[2]

[1] WHO Global Health Observatory Data 2013
[2] Dr Socorro Escalante - Health Systems Team Leader WHO Excerpt from: 'WHO and Viet Nam – Health for All: now and into the future' prepared for MOPAN by WHO

The current health sector plan 2010-2015[3] identifies ten tasks for health sector development, seven of which are directly relevant to the immunization program:

- Consolidating the health care delivery network especially grass-roots level
- Strengthening preventive medicine
- Strengthening population - family planning and reproductive health care
- Developing health human resources
- Developing health information systems
- Renovating health service operations and financial mechanisms
- Strengthening health sector management capacity

The new health sector strategic plan for 2016-2020 is in the stage of development and will be adopted by the end of the year.

1.2. National EPI Program

Viet Nam has one of the strongest National EPI program in the region that has managed to reach and maintain high coverage levels for all antigens included in the national immunization schedule. During the previous cMYP cycle EPI has managed successful implementation of the MR SIA. In terms of the new vaccine introduction, Viet Nam National EPI take pro-active approach for realizing available opportunities, through the work with the government and international developing partners.

Despite of significant progress in the implementation of the National Immunization Program (NIP), there still are policy and operational challenges, which are highlighted in the recent National EPI review and which are taken into account, while identifying national goals, strategies and objectives for the next five year cMYP cycle.[4]

The details on the most challenging areas and key aspects for consideration are represented below:

- *The dual system of EPI public sector vaccines and fee for service non EPI vaccines* result in complexities and inconsistencies in reporting, immunization schedule and quality standards.
- *Urban EPI strategy* is becoming significantly more complex, with high rates of mobility and migration, variable levels of commitment from city governments for operations, and service delivery challenges associated with providing services in a very dense and mobile population setting.
- *Hepatitis B birth dose* coverage and timeliness of administration improved due to the significant improvements in hospital immunization service providing during the last five year period.
- *The introduction of MCV2 and DTP4 has been successful*, through in some provinces more communication and social mobilization work will be required to reduce drop out.
- *Scaling up of JE vaccination nationwide requires additional efforts for maintaining EPI achievements during the recent cMYP cycle.*

[3] Ministry of Health Vietnam Health Sector Plan http://www.wpro.who.int/health_services/VTN_2011-2015.pdf
[4] National EPI Review, August 2015

- *Chronic disadvantage experienced by specific at risk population groups* in some locations, including remote area residents, ethnic minorities, and mobile and migrant populations in both urban and rural settings.
- *Reduction or cancellation of EPI outreach and mobile strategy in some locations*, as the result of the publication of Circular 12 on immunization safety, creating real threat to strategies to reduce inequities in access.

1.2.1. Management and Financing

In terms of legal and regulatory frameworks, *a Law on the Prevention and Control of infectious Diseases*[5] enacted in 2008 details in Article 27 and 28 the principles of use of vaccines and medical products, which points out in particular that vaccines must be used for proper schedule and targets groups, and must also be used at qualified establishments. The National Regulatory Authority (NRA) in Viet Nam was recently certified by the WHO as having a fully functional regulatory system which will enable Viet Nam to ensure the safety and efficacy of vaccines used or produced in Viet Nam.[6] A decree on immunization is currently being finalized with the Ministry of Health.

As illustrated in the **Error! Reference source not found.**, the National Expanded Program on Immunization (NEPI) is managed by the National Institute for Hygiene and Epidemiology. Thereafter, the program management is decentralized to Regional EPI offices (4), Provincial Preventive Medicine Centers (63), and District Preventive Medicine Centers (704). Immunization services are integrated into the health service delivery model of the Commune Health centers, where immunization services are normally provided in sessions for 1 - 3 days per month, supplemented by mobile health strategies for remote areas, and immunization campaigns for disease elimination and control activities.[7]

A fee for service model of immunization for some vaccines also operates through public facilities. These service providers are linked to a communication network of Village Health Workers, whose responsibility include communication with and mobilization of the communities for immunization sessions as well as implementation of the community based surveillance.

[5] Government of Vietnam Law on Prevention and Control of Infectious Diseases Hanoi 2009
[6] WHO National Regulatory Authority of Viet Nam Meets International Standards for Vaccine Regulationhttp://www.wpro.who.int/vietnam/mediacentre/releases/2015/nra_vietnam_certification/en/
[7] The last campaign was conducted in 2014 nationally (measles and rubella)

Figure 1: NEPI Structure

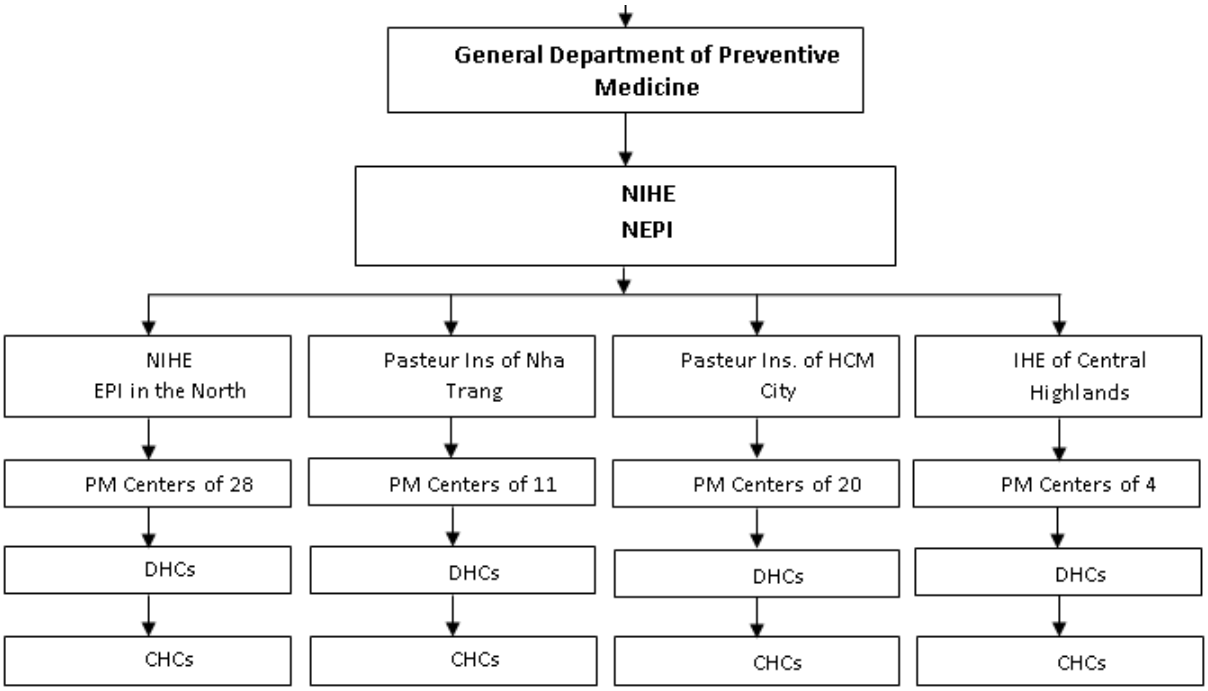


Table 2**Table** 2 below outlines the immunization schedule in Viet Nam. IPV, MR and Rotavirus vaccines are under consideration for introductions in 2016 and 2017, suggesting that there are likely to be ongoing revisions to the national immunization schedule.

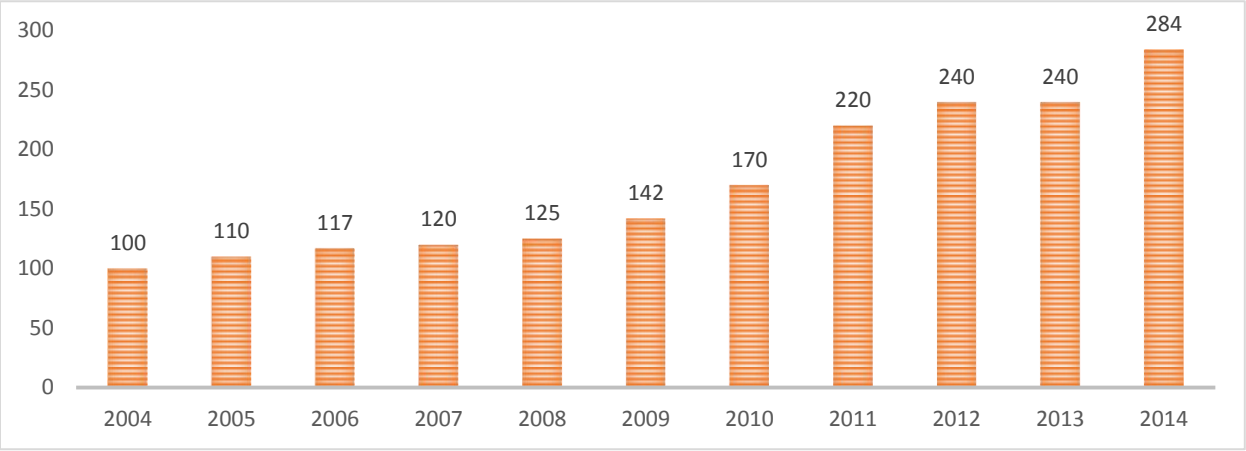
Table 2. Immunization Schedule and Program Development during the previous cMYP cycle

Vaccine	Birth	2 M	3M	4 M	5M	9M	18 M
BCG	X						
DTP							X
TT	Pregnant women and women of childbearing age (High risk areas)						
HepB	X						
JE	2 doses in the first year at 1-2 weeks interval, and another dose in the 2nd year						
Measles						X	X
OPV		X	X	X			
DTP-HepB-Hib		X	X	X			
Typhoid	1 dose for 3-10 years old						
Cholera	2 doses at 1 month interval for 2-5 years old						

The current *comprehensive multi-year plan for immunization (cMYP) 2011-2015*[8] identifies 12 main strategies for program development in 2011-2015, which include achieving measles elimination by 2012, improved control of hepatitis B and JE, elimination of invasive Hib disease by 2015, introduction of other new and under-utilized vaccines including Measles-rubella (MR), pneumococcal conjugate vaccines, HPV and rotavirus and finally continuation of special vaccines (Typhoid and Cholera) in high risk areas. In support of global targets for polio eradication, the country was planning to introduce IPV vaccine in 2015, however the introduction was postponed for 2016.

The national program is financed nationally through the MoH and increasingly through local government at the provincial and district level. Data provided by EPI shows an increasing trend for financing of EPI by the national Government, as illustrated in Figure 2below. Data provided through the Joint Reporting Form system indicates that the proportion of the national program funded by the government is 44% in 2014, up from 39% in 2010.[9]

Figure 2. Government Funding of EPI (billion VND)[10]



1.2.1 Immunization Service Delivery

Overall, the review teams observed a consistent and robust immunization service delivery strategy across the reviewed provinces.

There is a high level of demand and social mobilization, as is evident from the fact that most vaccinations are provided through health facility sessions that take place two to three days every month. Given the preliminary findings from the immunization coverage survey indicate high DTP3 coverage (90%), then this *service delivery strategy (in the context of Viet Nam) could be considered both highly effective and very efficient*.

However, the EPI review identified a number of service delivery challenges in both the current and upcoming planning cycle.

Fee for Service Immunization and Alignment with Policy and Reporting

[8] Ministry of Health EPI Multi-Year Plan for EPI 2011-2015
[9] WHO Immunisation Monitoring Data base WHO GVA 2015
http://apps.who.int/immunization_monitoring/globalsummary/countries?countrycriteria%5Bcountry%5D%5B%5D=VNM&commit=OK
[10] [10] National EPI Review. Vietnam August 6 2015

The first challenge relates to the operation of the "dual system" of EPI immunization and the "non-EPI" fee for service model that operates simultaneously in health facilities across the country. This strategy, though innovative, presents following major policy and operational questions:

- *Existing system of double standards of care.*

There is concern that a system of double standards of care is operating, whereby families who use service payments for EPI can access this service any day of the month in contrast to free-of-charge provision of EPI vaccines, which can be accessed only 2-3 days per month.

- *Usage of different vaccines by the EPI and non-EPI immunization models.*

Currently, different vaccines are provided according to a different immunization schedule (e.g. MR and MMR), raising concerns as to the degree to which this may be causing confusion in public health strategy for control of vaccine preventable diseases.

- *Different standards for monitoring vaccine management quality.*

There are concerns with regards to some standards for monitoring quality of vaccine management, which may differ between the EPI immunization program and the "non-EPI", fee for service immunization models.

- *EPI and non-EPI immunization service providers.*

Human resources for EPI and non-EPI vaccines are the same, but allocation of time between activities related to EPI and non-EPI is unclear.

- *Different reporting, recording and vaccine management in the EPI and non-EPI immunization service delivery.*

There's a lack of clarity on how fee for service immunization reports to the public health sector, which raises some doubt as to the real coverage of EPI vaccines on the public routine immunization schedule.

Taking into account importance of the aspects reflected above, strengthening of immunization Policy to set a consistent set of guidance and standards for implementation of a nationwide immunization and strategy calls to particular attention.

Immunization Safety and Outreach Services

The outreach service provision has stopped after publication of the circular 12, which sets conditions for provision of safety and quality of immunization. This has resulted in suspension of outreach services in almost all parts of the country, which has important implications on equity in immunization service provision, as many of the most disadvantaged and poor families reside in remote areas. Flexibility in interpretation of Circular 12 was highly recommended by the National EPI review[11] in order to ensure that remote area residents in particular have adequate access to mobile or outreach service strategy.

Equity Strategy for Routine Immunization

Viet Nam immunization program ensured high coverage rates, however reaching the most disadvantaged population still remains the most significant challenge for EPI. Existence of following different types of

[11] National EPI Review, 2015

disadvantaged population groups who are most at risk of not accessing immunization services suggests about the equity problems in the national immunization program of Viet Nam [12]:

- *Migrant populations* who move to Provinces or Cities and who may not be registered with local authorities
- *Mobile populations* who come and go from their place of residence on a periodic basis in search of employment in other locations
- *Remote Area residents* cut off from health services by seasonal flooding due to poor road access
- *Ethnic minority populations* who may not always understand Vietnamese language and immunization messages

Reaching these at risk population groups requires flexible interpretation of Circular 12 to ensure mobile or outreach services to the communities. It also means careful implementation of coverage monitoring, micro-planning to reach every community, tracking of drop outs and securing of operational financing to support targeted mobile/outreach strategy implementation.

Urban EPI Strategy

Tracking populations is a major issue in the urban setting, given the high rate of internal migration and mobility of the population. In the most cases, the temporary residence place for internal migrants is not necessarily the place where they try to access immunization services. The coverage data is further complicated by the high level of immunizations provided through the non-EPI service provision model.

Given the very large population base, operation finances are critical in order to provide the adequate immunization sessions. Financial commitments of local governments varies significantly that raises legitimate questions regarding standards for operational financing in urban context.

In terms of Circular 12, the limitation on the size of sessions to 50 persons per session is challenging in the urban context where population density is higher and immunization sessions are necessarily larger. Finally, waste management is far more challenging in an urban context, where the volume of waste is higher and the areas for disposal are more limited. All of these issues are likely to become more challenging as these cities continue to expand in the next 5 to 10 years that would require development of a specific Urban EPI strategy for the next cycle in order to address these challenging policy and operational issues.

Hepatitis B Birth Dose and MCV2 DTP4

Although there remain many obstacles to achieving timely and high coverage for hepatitis B birth dose, there has been significant improvement when compared to the 2009.[9] Hospitals have functional cold chain and vaccine management systems, and are reporting data regularly to provincial and District Preventive Medicine Centers. There is reasonably high coverage in the hospital settings, and contraindications for immunization with hepatitis B birth dose are documented according to the MoH guidelines. In remote areas, absence of mobile/outreach strategy (due to lack of operational financing and adequate human resources) means that for those who still deliver at home, a timely hepatitis B birth dose is not possible in some circumstances. In some locations, hesitancy to vaccinate from clinicians and

[12] National EPI Review, Vietnam, August 2015

families is still evident due to fear of AEFI. Given that nationwide delivery at facility is 92%, there remain many opportunities for the improvement in coverage through communication strategy with families and clinicians. MCV2 and DTP4 coverage is high in some provinces, while in others there remains significant drop out from the previous doses, highlighting the importance of coverage monitoring and drop out tracing, and local area communication strategy to support completion of the vaccination according to the existing schedule.

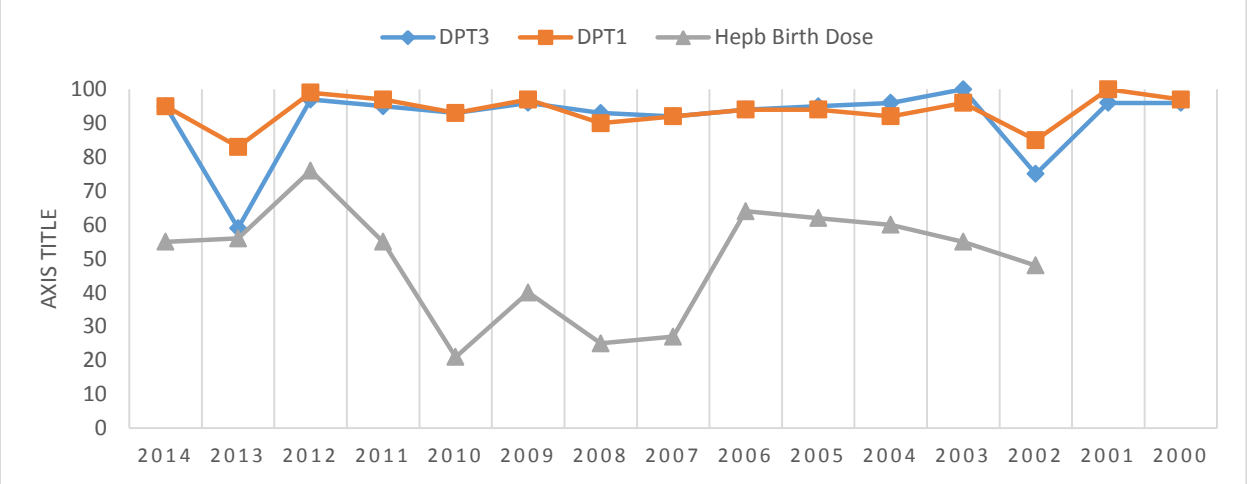
Service Integration

In terms of EPI service delivery strategy, most immunizations are provided at facilities, which means that by definition the services are integrated into the PHC services. There was little evidence however that EPI was integrated with other services during outreach and/or mobile health strategy. Program finances and guidance is managed vertically, so there remains limited policy guidance on this issue. Given the scope of the issue (PHC), it would seem that improved service integration for outreach or mobile strategy would require appropriate health sector policy and guidance.

1.2.2 Coverage and Reporting of Vaccine Preventable Diseases

High coverage has been maintained by most antigens for the last 10 years with a number of exceptions. There was a sharp drop in immunization coverage for DTP3 in 2013, related to a nationwide suspension of pentavalent vaccine following an AEFI. The other notable observation is the hepatitis B birth dose coverage, which is lower than expected given the high facility delivery rate in Viet Nam (92%). Although the coverage has recovered from the decline during the previous planning cycle, recent AEFI events may have also contributed to the moderate coverage levels.

Error! Reference source not found. Despite the overall high coverage, a plan recently developed in



Viet Nam to strengthen immunization services has pinpointed the areas of the country with immunization coverage lower than 80%.

As part of this planning, an analysis of rural districts with <80% coverage for DTP-HepB-Hib3 or MCV2 in 2014 identified 91 districts in the country distributed in 26 provinces: 12 districts are in the north, 4 in central regions and 10 in the south. A total of 68 out of the 91 districts reported measles cases in 2014, with a range from 1 case to 179 cases per district.

This issue of inequities in health outcomes has been confirmed by publication of infant mortality rates by region, which has found that the highest rates are in the two poorest regions, the Central Highlands and the Northern midlands and mountain areas.[13] Ethnic minority groups, which constitute 14% of the national population, have significantly poorer health and socio economic status than the majority ethnic group.[14]

In 2014 Viet Nam faced measles outbreak. An analysis of the outbreak revealed that, since the beginning of 2014, more than 86% of those infected were not immunized or their vaccination status was unknown.[15] Also of note was the occurrence in April-May 2012 of two isolated cases of Circulating Vaccine-derived Poliovirus type II (cVDPV2) detected in two provinces in the Southern region, although there have been no reports of cVDPV since then.

Table 3 documents the reported cases of vaccine preventable diseases between 2010 and 2014: the measles outbreak in 2014 (final case number over 15,000, with incidence of 71/ 1 million),[16] rubella outbreak in 2011, and the persistence of reported JE cases (n=450 in 2014) despite the scale up of the immunization program to 80% of the target population.

Table 3. Disease Prevention and Control

Diseases	2014	2013	2012	2011	2010
Diphtheria	16	11	12	13	6
Japanese encephalitis	421	224	183	126	140
Measles	15'033	1'123	578	750	2'809
Pertussis	90	54	98	105	81
Polio	0	0	0	0	0
Rubella	59	54	185	7'259	2'300
Rubella (CRS)	1	3	92	189	_
Tetanus (neonatal)	34	46	39	32	35
Tetanus (total)	244	306	253	186	196

A downward trend in vaccine preventable diseases were confirmed by number of studies and publications[17] that confirms potential for new vaccines to contribute further to mortality and morbidity decline.

Acute respiratory infections are the leading cause of hospital admission and childhood mortality. The most common causative agents in children have been found to be *S. pneumonia*, accounting for approximately 30 to 50 percent of cases, and *H. influenza* B (Hib) causing from 10 to 30 percent of cases. Similarly, the most common causative agents of meningitis have proven to be *Hib, N. meningitidis* and *S.*

[13] MOH Joint Annual Health Sector Review 2014
[14] UNFPA Ethnic Groups in Viet Nam: An analysis of key indicators from the 2009 Viet Nam Population and Housing Census, UNFPA, 2011, Hanoi, Viet Nam
[15] WHO Measles control in Vietnam April 2014
http://www.wpro.who.int/vietnam/mediacentre/features/measles_control_vietnam_2014/en/
[16] WHO Manila Measles Rubella Bulletin Volume 9 • Issue 6 • June 2015
[17] A Joint Annual Health Sector Review

pneumonia. According to health statistics in Viet Nam, the main causative agent of acute diarrhoea that requires hospital admissions is *rotavirus*.[18] Although 11 vaccines for routine immunization are available free of charge through the public sector, other vaccines, which were not included in the routine immunization schedule, covering many of the diseases mentioned above are only available for higher income families through the fee for service immunization system.

1.2.3 Cold Chain and Vaccine Management

Historically about 60%-70% commune health centers (CHCs) had refrigerators for storing EPI vaccines, with priority given to the CHCs serving geographically challenging areas (e.g. remote mountainous areas). In recent years, encouragingly the number of CHCs with refrigerators has been increasing, with the funds contributed by either provincial or district governments. There are also some small proportion of domestic refrigerators used for storing EPI vaccines.

There were impressive systems in place to collect and update cold chain equipment inventories on a quarterly basis across all levels. In the eight provinces/cities visited, good cold chain maintenance mechanisms, which were often financed and managed by PMCs, were found functioning well and district PMCs visited appeared satisfactory with the support.

Cold chain capacity appeared sufficient at present and so for the introduction of IPV and MR which would come soon. However, the current capacity might not be sufficient for 2017 when more new vaccines are introduced, particularly bulky vaccines such as rotavirus vaccine. To date the final discussion has not yet been made regarding which new vaccine/s would be introduced and when. Given the above background, to facilitate decision-making (both short-term and long- term) and preparedness for introduction, the EPI will assess surge needs of cold chain storage capacity under various scenarios of new vaccine introduction (e.g. JE alone, JE+rota, rota+IPV). This work is urgent considering that the country was already awarded with Gavi support for IPV introduction and is going to submit the Rotavirus vaccine introduction application to Gavi in September 2015 which would be the last opportunity for the country for the Gavi's support on new vaccines. This is due to the fact that the country would soon graduate from the Gavi support due to its increased GNI per capita which will be exceeding the Gavi's eligibility threshold.

In 2015, with support of international development partners, EPI conducts Effective Vaccine Management Assessment, which would assess existing condition of the cold chain and produce Vaccine Management Improvement Plan that would include recommendations and actions for upgrading cold chain and improving vaccine management.

1.2.4 Immunization safety and AEFI

Immunization safety

Auto-disable (AD) syringes and safety boxes were introduced in to EPI at all levels since 2003. All EPI inoculations except BCG doses are given by AD syringes produced by a local state-owned manufacturer (Mediplast). EPI will introduce AD syringes for BCG from 2016.

There has been a special training on the immunization safety and AEFI surveillance after a series of fatal AEFI in 2013-2014. All level of facilities in 8 selected provinces received this training.

[18] MoH Joint Annual Health Sector Review 2014

Waste management

The Safe Injection Global Network (SIGN) held in Hanoi in 2005 discussed EPI and other medical waste according to the Stockholm Convention. There is an infection prevention and control (IPC) guideline (following decision 43/2007/QD-BYT regarding promulgating the regulation on management of medical waste) which mentioned general medical waste, but it is not clear on the treatment of EPI waste. However, since then, there has not been any strict regulation or policy decision on waste management.

Similar to the findings of the last review, CHCs now apply different final disposal methods of safety boxes. Some CHCs use their simple brick incinerator in the backyard of HC, some apply open burning, and some bury in the ground in the backyard. However, in large cities like Hanoi and HCMC, the provincial PMC instructs the district PMC to contract with a private company to collect used safety boxes monthly. The private company stated that they incinerate wastage, but the detailed information of the real operational procedure is not clear, such as incineration temperature, dioxin concentration, monitoring environmental hazard, etc...

Adverse Events Following Immunization (AEFI)

Adverse Events Following Immunization (AEFI) monitoring is one of the most important parts of the Expanded Programme on Immunization. AEFI has resulted in special public attention given to the EPI in last few years. Despite WHO investigation of AEFI due to pentavalent vaccine, it was concluded that there was no sign of a vaccine problem. However, it still fuels concerns among the community.

During the period 2013-2015 Viet Nam implemented activities to improve the AEFI system including the revision of guidelines for immunization program managers on AEFI surveillance, updating from guidelines of the WHO Pacific Region, establishing AEFI technical advisory committee of provinces, and training and re-training of health staff.

In June 2015 the WHO formally certified that Viet Nam had a fully-equipped national regulatory system that ensured the safety and efficacy of vaccines produced and used in Viet Nam. The National Regulatory Authority of Viet Nam is compliant in all areas required to provide regulatory oversight of vaccines: overall system framework, marketing authorization and licensing, post-marketing surveillance, including for adverse events following immunization, lot release, and laboratory access, regulatory inspections of manufacturing sites and distribution channels, as well as authorization and monitoring of clinical trials.[19]

The new regulation Circular12 with detailed guidance documents helped health workers while practicing immunization and contributed to placing special attention on safe injection and AEFI. However, through the experience of implementation, regulation Circular12 shows some limitations such as no more than 50 children per each immunization session; this regulation would help in the case of crowded sessions where there is poor observation of children. However, in the area with high target population in urban and rural areas, the immunization service provision should be optimized through better application of contraindications, organization of adequate number of sessions and improvement of communication with program beneficiaries.

[19] WHO representative office http://www.wpro.who.int/vietnam/mediacentre/releases/2015/nra_vietnam_certification/en/ accessed on August 29, 2015

1.3. ACHIEVEMENTS IN 2011-2015

Globally in the last 5 years, a major immunization highlight has been the development of the Global Vaccines Action Plan, which describes strategies, activities and indicators to achieve and measure the Decades of Vaccine vision.[20] This plan has been translated into a Regional Framework for Action,[21] which encompasses the following main objectives and targets:

- Polio eradication
- Measles elimination
- Hepatitis B control
- Maternal and neonatal tetanus elimination
- Rubella control
- Accelerated control of JE
- Evidence based introduction of new vaccines
- Acceleration of routine immunization

In Viet Nam in the last 5 years, pentavalent vaccine was introduced in 2010 and DTP4 were introduced into the schedule at 18 months of age. A MR campaign was conducted in 2014 nationwide (target population 1 to 14 years with a total target pop. of 20,095 million).[22] The Japanese encephalitis prevention program has also expanded to cover 100% of the country.

Polio eradication status has been sustained since 2000, and MNTE validation since 2005. The HBsAg+ rate of under 5 year old children has been reduced to under 2% since 2012.

From October 2012, an increasing number of serious adverse events following immunization (AEFI) with the pentavalent vaccine[23] have been reported, which led to highly-publicized media reporting. *In 2013, Viet Nam announced a temporary suspension of the vaccine.*[24]

Following the impact of AEFI events in 2013/2014, the country has regained higher coverage rates. In response to the AEFI, the EPI has implemented nationwide training programs in injection safety, and strengthened the systems of Provincial AEFI committees and reporting. The EPI review in 2013 revealed that children from ethnic minority communities had lower immunization coverage. Increasing migration and urbanization are both reported to be increasing with substantial proportions of migrants being young, temporary and unregistered.[25] In response to these challenges, EPI has developed operational guidelines for "Reaching Every Community."[26]

[20] WHO Global Vaccines Action Plan http://www.who.int/immunization/global_vaccine_action_plan/en/
[21] WHO Regional Framework For Implementation Of The Global Vaccine Action Plan In The Western Pacific http://www.wpro.who.int/about/regional_committee/65/documents/wpr_rc065_08_EPI_en.pdf?ua=1
[22] MoH NEPI Measles Rubella campaign Report 2015
[23] Quinvaxem®
[24] MoH NEPI Information sourced from IPV proposal
[25] IPV Vaccine Proposal MoH NEPI 2015
[26] MoH NEPI Draft Plan To Strengthen Immunization Services In Hard To Reach Areas In Viet Nam Using The Reaching Every Community Strategy Version 7 April 2015

Surveillance developments have included establishment of three Congenital Rubella Syndrome sites, and also establishment of JE sentinel sites in the same three large national pediatric Hospitals.[27]

2. Comprehensive Multi-Year Plan for EPI: 2016-2020

Main goal of the cMYP during 2016-2020 is to maintain EPI achievements and decrease vaccine preventable disease incidence within EPI through introduction of the new vaccines and control and elimination of Vaccine Preventable Diseases. The plan builds on the achievement of the previous plan (cMYP 2011-2015) to further consolidate and maintain the progress made during the previous period and set new milestones and targets.

The plan also intends to strengthen the linkages of EPI with broader health systems, expansion of HepB birth dose vaccine will be used to strengthen the overall linkages with maternal health services as well as administration of the routine immunization will be used to strengthen the linkages between the NIP and primary health care sector of the country.

The Main Goal, Strategic Objectives, Key Activities and Costing/Financing Plan are the major elements of the cMYP for 2016-2020, which were developed based on the situation analysis and taking into account the global and regional goals as well as national priorities set by the Government of Viet Nam.

The main goal of the immunization program during the period 2016-2020 is as follows:

EPI achievements are maintained through decreased incidence of vaccine preventable diseases by controlling and elimination of VDPs and introduction of the new vaccines in the routine immunization schedule of the national immunization program.

The main principles which would guide the efforts to achieve this goal are:

- *Quality and Safety* – to *ensure* immunization services based on the best practices.
- *Maximal coverage and reach* - to overcome access barriers at all levels;
- *Equity and gender equality* – to give priority to the underserved and hard-to-reach and high risk groups;
- *Sustainability through technical and financial capacity strengthening and Excellence in Program Management* – to ensure effective use of resources following result-based principles and evidence-based practices.

2.1. National Objectives, Strategies and Key Activities 2016-2020

During the five-year period, 2016 – 2020, the strategic objectives and key strategies are as follows:

Objective 1 – EPI achievements are maintained and VPD incidence is decreased within EPI

To achieve the above mentioned objective, following broad strategies are incorporated into the cMYP:

Strategy 1.1 - Reaching over 90% coverage of fully immunized children (FIC) for children under 1 years of age;

[27] WHO case Study of JE surveillance 2014 5 Country Study

Strategy 1.2 – Reaching over 90% coverage for JE3 among the 2-5 year old children groups;

Strategy 1.3 – Introduce IPV and Rotavirus vaccine in the routine immunization schedule of EPI;

Strategy 1.4 – Eliminate Measles by 2017

Strategy 1.5 – Ensure Hepatitis B control

Strategy 1.6 – Ensure Pertussis control

Strategy 1.7 - Ensure control of diphtheria

Strategy 1.8 – ensure vaccination of children in high risk areas with cholera and typhoid vaccine

Strategy 1.9 – Implementation of the JE SIA in the high risk areas.

Coverage

The foundations of the EPI service delivery system in Viet Nam remains very strong, and preliminary coverage survey demonstrate high coverage in surveyed sites, with provincial Coverage for fully immunized child ranging from 84% to 97%.

The current immunization service delivery strategy (fixed facility sessions 2-3 days per month), backed up by a communication network of village workers, is clearly highly effective and efficient in maintaining high coverage in Viet Nam to realize EPI strategies.

Although, most of the vaccine preventable diseases, such as, diphtheria, pertussis, measles, polio, and tetanus are largely controlled, these diseases are not yet eradicated and may come back with decline in vaccination coverage as it was proven by large-scale outbreaks of measles in 2014 in Viet Nam. Therefore, there is a need to reach and maintain high coverage with these antigens in order to maintain gains in reduction in disease mortality and morbidity. Even for polio, which has been eradicated nationally, there is a need to maintain high coverage levels until the disease is eradicated globally.

Japanese Encephalitis (JE)

Viet Nam is endemic for JE with regular seasonal epidemics as demonstrated by national surveillance for viral encephalitis (defined clinically, also called suspected JE) complemented by laboratory testing for JE at some sites. In 2014 there were 450 JE cases reported despite the scale up of the immunization program to 80% of the target population. Japanese Encephalitis vaccine use has been gradually expanded since its introduction in 1997 in 11 high-risk districts in 2009. There was no specific surveillance system for JE until 2011. Sentinel surveillance in three national children hospitals and five selected provinces was established within the national program in 2011, and increasing numbers of JE cases have been reported since then due to better investigation. Besides sentinel surveillance, two national laboratories in NIHE and Pasteur Institute HCM have responsible for confirmation testing from provincial PMC in line with WHO JE lab net system. Recently JE vaccination scaled up across the country. Many provinces of the country changed schedule of immunization sessions and conducting the sessions two times a month targeting JE second dose along with the children up to 23 months, who missed routine immunization before 12 months.

Introduction of new and underused vaccines

Some diseases such as rubella, rotavirus, human papilloma virus, mumps and pneumococcus, for which vaccines have become available recently, but are not used in the EPI Viet Nam, are perceived to cause high levels of disability, morbidity and mortality. Over 100,000 babies are born with congenital rubella sindrom (CRS) every year. There been steady increase in the number of countries from ninety nine in 2000 to 141 in 2014 introducing rubella containing vaccines (RCVs) into their routine immunization programs to prevent CRS. Yet despite these intensive immunization efforts, 2014 was marked by measles and rubella outbreaks across Europe and in countries as disparate as Ethiopia, Iraq, Sudan, Syria, and the United States. These and other outbreaks demonstrated, yet again, the ability of the measles and rubella viruses to spread quickly and exploit gaps in population immunity. By the end of 2014, an estimated 400 children were dying from measles and close to 300 newborns were entering the world with the disabilities of CRS every day.

Rotaviruses are the most common cause of severe diarrheal disease in young children throughout the world. According to WHO 2008 estimates, about 450 000 children aged <5 years die each year from vaccine-preventable rotavirus infections; the vast majority of these children live in low-income countries. Rotavirus vaccines considered highly effective in preventing severe gastrointestinal disease. In low income countries, vaccine efficacy can be lower than in industrialized settings, similar to other live oral vaccines, but even with this lower efficacy a greater reduction in absolute numbers of severe gastroenteritis and death was seen, due to the higher background rotavirus disease incidence. WHO recommends that rotavirus vaccines should be included in all national immunization programs and considered a priority in some regions, particularly in South, Southeast Asia and Sub-Saharan Africa.

Inactivated polio Vaccine has been discussed for potential introduction since 2010 for maintaining polio free status that was validated in 2005. The introduction of IPV vaccine was postponed due to the lack of required financial resources, however with the financial assistance from Gavi, the vaccine will be introduced at the beginning of the new cMYP cycle.

Introduction of new and underused vaccines have substantial impact on child survival in Viet Nam. However, even considering substantial increase in government funding during the last few years, the available resources are still not sufficient to introduce all new and underused vaccines in the next five years, taking into account extension of the program and graduation from Gavi support. EPI has carefully evaluated cost-effectiveness and potential public health impact of existing opportunities in terms of new and underused vaccines' introduction and made decision to introduce MR, and Rotavirus vaccine in the routine immunization schedule during the next cMYP cycle. Other vaccines that are considered for potential future introductions include PCV and HPV.

Hepatitis B control

Hepatitis B virus (HBV) is one of the leading causes of liver disease in Viet Nam. Although there remain many obstacles to achieving timely and high coverage for hepatitis B birth dose, there has been significant improvement when compared to the 2009. Hospitals have functional cold chain and vaccine management systems, and are reporting data regularly to provincial and District Preventive Medicine Centers. In the hospital setting, it was found in many of the sites that there was reasonably high coverage, and contraindications for immunization with hepatitis B birth dose were documented according to the guidelines of the MoH. In some remote areas, absence of mobile / outreach strategy (due to lack of operational financing and adequate human resources) means that for those who still deliver at home, a

timely hepatitis B birth dose is not possible in some circumstances. In other locations, hesitancy to vaccinate from clinicians and families is still evident due to fear of AEFI. Given that nationwide delivery at facility is 92%, there remain many opportunities for improvement in coverage through communication strategy with families and clinicians.

During the period 2016-2020 EPI targets to decrease HBsAG+ rate among under 5 children group by 1%.

Diphtheria and Pertussis

Although in some provinces MCV2 and DTP4 coverage was high, in others there remains a significant drop out from the previous doses. This highlights the importance of coverage monitoring and drop out tracing, and local area communication strategy to support completion of the schedule.

During the cMYP period EPI targets to decrease incidence of Diphtheria less than 0.01 per 100,000 population and incidence of pertussis 0.1 per 100,000 population.

Cholera and Typhoid

Viet Nam has been providing Cholera and Typhoid vaccines to high-risk population (e.g. cholera and Typhoid) since 1997, using domestically manufactured vaccines. In 2014, the domestically produced bivalent oral cholera vaccine is used in Hue province with annual birth cohort of about 19,000 and a total population of 134,812 Typhoid (Vi polysaccharide) vaccine has been used in 3 provinces (An Giang, Kien Giang and Dien Bien). Both the vaccines were administered to 2-5 years old children in annual campaigns. However, there has been no systematic evaluation of the program since the vaccine introduction. EPI has not been involved in collection of any surveillance data, though both are notifiable diseases.

During the cMYP period NEPI will continue immunization with these special vaccines in high risk areas. In addition EPI will implement key programmatic strategies elaborated prior to implementation of the previous cMYP 2011-2015. More specifically National EPI will:

- Develop clearly defined policies and criteria for defining high-risk population and high-risk areas for cholera and typhoid vaccination by the end of 2016, based on the technical consultations within national advisory body and international partners;
- Develop policy and guidelines for cholera and typhoid vaccination age groups, vaccine delivery strategies, schedule, boosters and etc. This should clearly define the age-group that will be regularly vaccinated. This should e informed by the experience gained since introduction of the vaccine in 1997.
- Maintain typhoid and cholera vaccination in high-risk areas as in previous plan but fine-tune the program based on the policy and guidelines developed as mentioned above;
- Conduct special studies to evaluate the impact of typhoid and cholera high-risk vaccination strategies;
- Coordination with notifiable disease surveillance to collect data on typhoid and cholera cases on regular basis.

Japanese Encephalitis (JE) SIA

Since, Viet Nam conducted a nationwide SIA for MR it does not anticipate the need for another large-scale SIA during this plan period for MR or for other vaccines (e.g. OPV or TT) with maintenance of rather high

routine coverage. However, a provision is kept in the plan for small scale SIAs in high-risk areas covering around 11% of annual population. With expansion of JE vaccine in all districts of the country, a one-time catch-up campaign for children 2-5 years will be organized for Japanese encephalitis in the high-risk districts, followed by regular vaccination starting at age 1.

Objective 2 – Strengthen the EPI system through capacity enhancement

The following strategies were elaborated for achieving objective 2:

Strategy 2.1 – Enhance capacity of EPI staff at all levels, through trainings and supportive supervision;

Strategy 2.2 – Advocacy and lobbying for financing of EPI program;

Strategy 2.3 – Mobilizing resources from Government and Implementing Partners;

Strategy 2.4 – Support hard-to-reach areas to increase immunization coverage, especially among the minority groups.

The National EPI program in Viet Nam has a very strong foundation on which to build a long term future. The health system is well networked by a system of decentralized (though vertical) management and delivery systems. There is high demand for immunization services at facilities, and high coverage from surveyed provinces. The infrastructure, though aging, is nonetheless adequate to the task. The increased complexity of programming associated with population movement and the growth of urban areas, persistence of immunization inequities and AEFI concerns in some areas, the emergence of parallel EPI and non EPI delivery systems, and the challenge of financing of operations in an increasingly decentralized context, are all major policy and operational challenges in the coming years. In order to address these challenges during the cMYP period, the EPI will invest in capacity strengthening at all levels through implementation of supportive supervision activities and planning and implementation of custom-tailored trainings to the immunization program staff. In addition, the program will utilize existing communication channels with the key policy- and decision-makers of the country as well as implementing partners for advocacy and lobbying immunization program and for securing adequate funding for implementation of program strategies and reaching the key objectives of the program.

According to the recommendations of the National EPI Review, the EPI will elaborate a dedicated strategy to expand immunization program and service delivery and increase immunization coverage in the hard-to-reach geographic areas of the country as well as expand it among the ethnic minority groups.

Strategic objective 3 – Improved quality of immunization services

Strategy 3.1 – Development and dissemination of regulations and technical guidelines on immunization

Strategy 3.2 – Conduct trainings and refreshing trainings of EPI staff at all levels, as well as HCWs at hospitals and service provision points involving HepB birth dose delivery

Strategy 3.3 – Strengthen communication

During the next five years the EPI will undertake substantial efforts for improving quality of immunization services through elaboration and establishment of the One System for public sector EPI and Non-EPI fee-for-service systems. Achievement of this objective would require development of the immunization policy for regulation of immunization service delivery schedule and service quality. Given the turnover of EPI staff at all levels, EPI will undertake efforts for increase investments for

comprehensive EPI training for middle-level management and immunization in practice in the next planning cycle. The program will also advocate development of necessary policies, regulations and procedures to ensure a minimum standard for financing of EPI operations as well as to reduce disparities between provinces of the country in terms of operational funding, as well as ensure viability of outreach/mobile strategy implementation for high-risk population.

Good social mobilization activities were reported during the recent MR SIAs targeting children aged 1-14 years old. For routine immunization, social mobilization mainly relied on the network of village health workers (VHWs). This mobilization worked well in some locations, but some districts faced challenges particularly in the urban areas where VHWs might not get the same payment as their counterparts in the rural setting. The use of local VHWs was considered to be especially important in areas with high proportion of ethnic populations, and forms the backbone of the communication strategy in most areas. Therefore, during the next cMYP cycle the EPI will continue investing in the implementation of communication strategies through the VHW networks in the rural areas and given the specific needs and challenges of urban immunization, a specific urban EPI communication strategy will be developed and implemented.

The hesitancy for hepatitis B birth dose and DTP4 vaccination in many of the study areas highlights the importance of balancing messages on immunization safety with messages encouraging families to complete vaccination schedules in a timely manner. Given the history of AEFI in the last 10 years in Viet Nam, communication about the risks on AEFI and routine immunization will remain a high priority in the next cMYP period and will be implemented according to the communication strategy for securing adequate resources to implement the national EPI communication plan, endorsed by the Health Minister in 2014 as a strong foundation to restore the public's confidence in immunization program. The EPI will also consider development of special communication strategies for unregistered families and migrant populations to raise awareness about the value of vaccination and where the immunization services are provided.

2.2. KEY ACTIVITIES

Table 4 represents key activities of the cMYP for implementation during the period 2016-2020 for realization of the cMYP strategies and achieving strategic objectives.

Table 4 Key activities of cMYP 2016-2020

Key activities	2016	2017	2018	2019	2020
A. EPI Achievements are maintained and VPD incidence is decreased within EPI					
Reaching over 90% coverage of fully immunized children					
Reaching over 90% coverage for JE3 among the 2-5 year old children					
1. Expansion of the coverage for JE3 among the 2-5 year old age group					
2. Catch-up campaigns for this target groups in the new areas of introduction					
3. Expansion of the case-based surveillance with lab confirmation of all cases at district and higher level hospitals					
4. Evaluation for the need of booster dose for JE or use of an alternative vaccine					
New Vaccine introduction					

5. Introduce IPV in the routine immunization program	x				
6. Introduce Rotavirus vaccine in the routine immunization program		x			
Eliminate measles by 2017					
7. High-quality nationwide case-based measles surveillance					
8. Active surveillance for measles in all districts					
9. Integrate measles laboratory support, training, logistics and supplies					
Hepatitis B control					
10. Monitor HepB3 coverage in every district with special efforts to increase timely HepB birth dose coverage					
11. Conduct nationwide HepB sero-survey					
12. Follow up with vaccine manufacturers to ensure VVM labeling on domestically manufactured vaccine					
Ensure Pertussis and diphtheria control					
13. Monitoring DTP coverage					
14. Monitoring drop outs					
15. Plan and implement best management and communication practices for decreasing DTP drop-out rates in all districts					
Ensure vaccination of children in high-risk areas with cholera and typhoid vaccine					
16. Development of national policy with criteria for high-risk areas and vaccination policy					
17. Maintenance of immunization in high-risk areas with typhoid and cholera vaccines					
18. Evaluate the impact of typhoid and cholera immunization among the high-risk population groups					
Implementation of JE campaign in the high risk areas					
19. Development of the JE campaign plan					
20. Implementation of the campaign					
21. Evaluation of the campaign results					
B. STRENTHEN EPI SYSTEM THROUGH CAPACITY ENHANCEMENT					
Enhance capacity of EPI staff at all levels through trainings and supportive supervision					
22. Conduct capacity needs assessment of EPI staff at all levels					
23. Plan capacity strengthening activities and develop materials					
24. Implement capacity strengthening workshops and training sessions of the EPI staff at all levels					
25. Plan and implement supportive supervision activities					
Advocacy and lobbying for financing of EPI program					
26. Conduct ICC meeting quarterly					
27. Develop communication materials and key messages for justification of funding needs of the National Immunization Program					
Mobilizing resources from government and implementing partners					
28. Maintain effective communication with the key policy- and decision-makers of the country					
29. Develop evidence-based information materials					
30. Disseminate information among the key stakeholders of the country for strengthening their capacity for informed decision-making					

Support hard-to-reach areas to increased immunization coverage, especially among the minority groups					
31. Development of the strategy for increasing immunization coverage in hard-to-reach areas of the country					
32. Implementation of the strategy					
C. IMPROVED QUALITY OF IMMUNIZATION SERVICES					
33. Development and dissemination of regulations and technical guidelines on immunization					
34. Conduct trainings and refreshment trainings of EPI staff at all levels, as well as HCWs at hospitals and service provision points involving HepB birth dose delivery					
Strengthen communication					
35. Development of the communication strategy and strategy implementation action plan					
36. Implementation of the communication strategy action plan					

3. Financial Sustainability of the cMYP 2016-2020

3.1. Cost and financing of the Viet Nam National cMYP

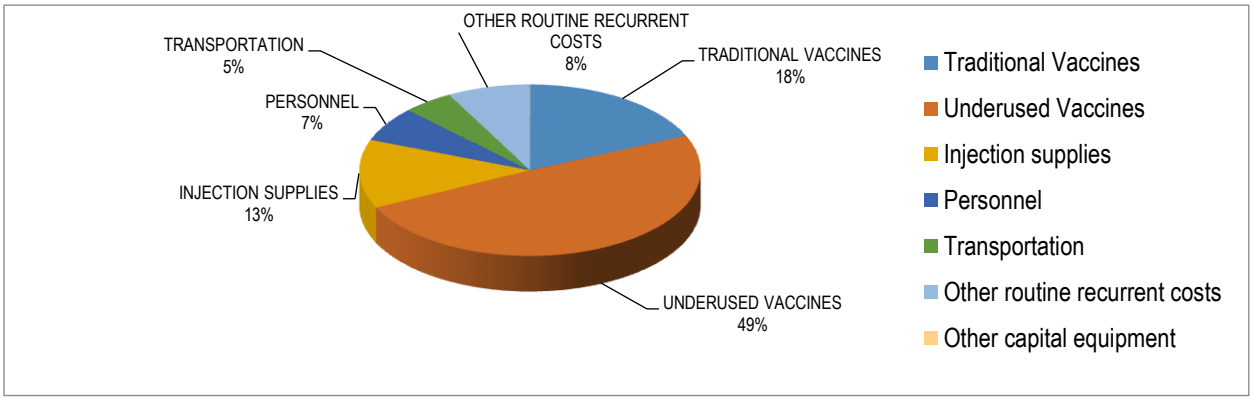
3.1.1. Background

The Government of Viet Nam is committed to provide appropriate, high quality vaccines for all children in each annual cohort. The government is also committed to assure adequate protection of all pregnant women by TT vaccine prior to giving birth. Beginning from 2016 the immunization services in the country will be provided within the Multi-year Plan for Immunization 2016-2020, developed and adopted by the Government of Viet Nam in August 2015. The Plan will serve as an instrument for coordination and harmonization of the plans and investments for immunization program implementation between the national and local levels, as well as rationalizes the local health systems and harmonizes support from the national government and development partners. Through this mechanism, the National EPI (NEPI) program works closely with Regional EPI offices, Provincial Preventive Medicine Centers, and District Preventive Medicine Centers to ensure commitment of support to health initiatives coming from the Central Government. Such a configuration ensures effective coordination of local health programs with national health goals and objectives and reduces the fragmentation in the health service delivery system.

3.1.2. SUMMARY OF KEY FINDINGS ON FINANCING OF THE EPI

Baseline financial indicators

Total Immunization Expenditures	**$60,905,828**
Campaigns	**$33,796,428**
Routine Immunization only	**$27,109,400**
Per Capita (Routine Only)	$0.30
Per DTP3 child (Routine Only)	$16
% Vaccines and supplies (RI)	80.8%
% Government Funding	61.1%
% THE	0.3%
% GHE	0.6%
% GDP	0.01%
Total Shared Costs	**$17,804,601**
% Shared health systems cost	22.6%
Total Immunization system costs	**$78,710,429**



Baseline costing profile

Strategic plan summary 2016-2020

Cost and financing Projections

	2016	2017	2018	2019	2020	Total
Total resources required (US$ million)	**$64.3**	**$85.3**	**$71.6**	**$71.6**	**$72.0**	**$364.7**
Cost per capita (in US$)	$0.47	$0.68	$0.54	$0.53	$0.53	$0.53
Total secure financing (US$ million)	$47.4	$60.1	$59.8	$57.9	$58.3	$283.9
Funding Gap (with secure) (US$ million)	**$16.9**	**$24.7**	**$11.8**	**$13.6**	**$13.7**	**$80.8**
Total probable financing (US$ million)	**$16.10**	**$27.00**	**$22.70**	**$19.70**	**$19.50**	**$105.10**
Funding Gap (with secure & probable) (US$ million)	**$0.75**	**0**	**0**	**0**	**0**	**0**
	1%					

Implications of the funding gap

1. The funding gap of $80.8 million with secure funds only represents almost 22% of total resource requirements for 2016-2020.

2. If the probable funding will not be secured the existing shortfall will impact achievement of immunization priority objectives, in particular the ability to improve coverage and increase VPD control and therefore the contribution of the immunization program to Viet Nam's overall health and development goals will be at risk.
3. In case if program fails in securing probable funding, the assessment of national immunization program priorities will be required to inform any reallocation of available funds.
4. Urgent resource mobilization activities are needed, targeting the Govt. of Viet Nam and development partners to secure required resources for program implementation.

3.1.3. KEY ASSUMPTIONS

Demographic projections

The calculation of total population size, size of birth cohort and target groups reflected in this report is based on the latest census data of Viet Nam (2009). The population growth rate for baseline year is 1.01%. Estimations for the period 2016-2020 were based on the flat population growth rate 1.93%[28]. Infant mortality rate is estimated at 16 (per 1,000 live births)[29] and the childbearing age woman rate (CBA) is estimated at 25% of total population[30].

Vaccine and injection supply costs

Viet Nam purchases greater part of vaccines through the self-procurement mechanism and uses vaccines produced locally. Table 5 represents price comparison between domestically produced vaccines and vaccines provided through the UNICEF supply division. The UNICEF prices reflected in the table are "unloaded prices" i.e. do not include freight, customs clearance and other costs.

Table 5: Comparison of vaccine prices

Vaccine Name	Presentation	Manufacturer	Formulation	Actual Price Per Dose	UNICEF Price[31]	Difference
BCG	Lyophilized	Domestic	20	0.07	0.14	-0.07
DTP	Liquid	Domestic	20	0.11	0.19	-0.08
TT	Liquid	Domestic	20	0.05	0.05	0
HepB	Liquid	Domestic	1	0.38	0.38	0
JE	Liquid	Domestic	10	0.48	0.42	0.06
Measles	Lyophilized	Domestic	10	0.25	0.28	-0.025
MR	Lyophilized	External	10	0.84	0.60	0.24
OPV	Liquid	Domestic	20	0.21	0.17	0.045
DTP-HepB-Hib	Liquid	External	1	3.70	2.35	1.35
Rotavirus	Liquid	Domestic	1	3.20	3.5	-0.3
Cholera	Liquid	Domestic	5	0.43	-	-
Typhoid	Liquid	Domestic	20	0.56	-	-

[28] NSO
[29] Data provided by NEPI
[30] NEPI
[31] Awarded prices per dose are, latest year available: http://www.unicef.org/supply/index_57476.html (accessed on August 18, 2015)

All routine vaccines except BCG are administered with AD syringes produced by a local state-owned manufacturer (Mediplast). The EPI will introduce AD syringes for BCG from 2016.

Table 6 Unit costs – vaccines (comparison with UNICEF recommended prices)

Injection Supplies	Actual prices	UNICEF prices	Difference
AD syringe 0.5 ml	$0.077	$0.069	$0.008
AD syringe for BCG 0.05 ml	$0.145	$0.086	$0.059
Reconstitution syringe (Measles/Yellow Fever) 5 ml	$0.054	$0.040	$0.014

Wastage rates

Table 7 shows target wastage rates of vaccines for the cMYP period. For single and 2-dose formulation vials target wastage rates are in line WHO/UNICEF recommendations. The only exception is wastage rate for BCG (20 dose vial) that is higher of the maximum recommended level of 50%.

Table 7 Wastage targets

Type of Vaccine - Routine Immunization	2016	2017	2018	2019	2020
BCG	54%	54%	54%	54%	54%
DTP	34%	34%	34%	34%	34%
TT	34%	34%	34%	34%	34%
HepB	9%	9%	9%	9%	9%
JE	34%	34%	34%	34%	34%
Measles	34%	34%	34%	34%	34%
MR	34%	34%	34%	34%	34%
OPV	34%	34%	34%	34%	34%
DTP-HepB-Hib	5%	5%	5%	5%	5%
Rotavirus		5%	5%	5%	5%
Cholera	10%	10%	10%	10%	10%
Typhoid	15%	15%	15%	15%	15%

3.1.4. Findings on Baseline Expenditures

The year of 2014 was selected as the baseline for the financial analysis because that is the most recent year for which full costing and financing information was available. The baseline year cost calculation is based on the actual expenditures for the program implementation. Data for the estimations and projections, including the economic data were provided by the EPI Viet Nam Office, WHO and UNICEF Country Offices.

The main findings of the cost analysis for the baseline year are following:

- Total expenditure for program implementation in 2014 was $78,710,429, including health system shared costs[32] and $60,905,828 without shared costs.

[32] Health system shared costs include the value of inputs that are not specific to immunization and which are used by different activities or programs in the health sector – i.e. staff working part-time on immunization or equipment shared with other services

- Out of this total expenditure for program implementation $33,796,428 represents the expenditures for the MR Supplemental Immunization Activities (SIAs) carried out during the baseline year.
- The cost per DTP3 fully immunized child was 16$.
- Vaccine cost was the largest cost category in the baseline year, accounting to $21,894,343 (or 80.8%) of total expenditures for routine immunization program;

The baseline indicators of the Viet Nam's Immunization Program are represented in the below table.

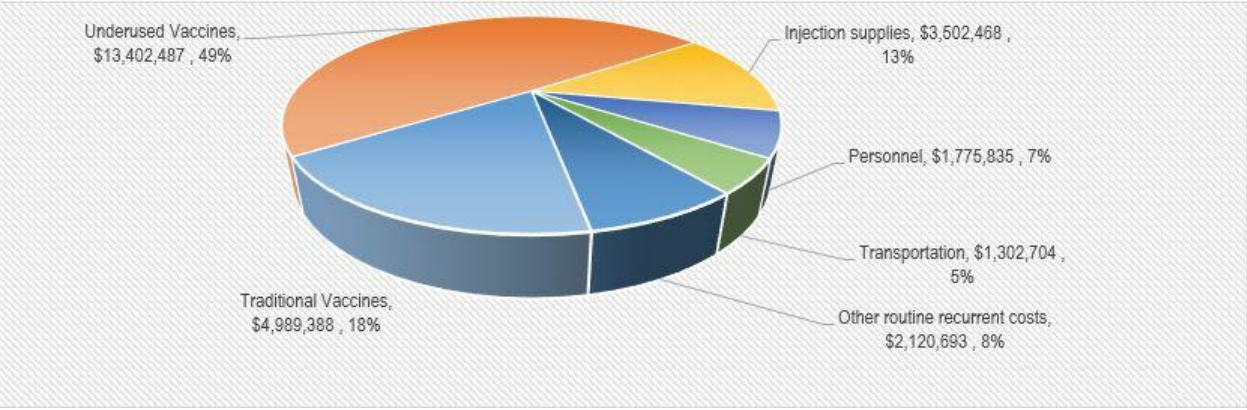
Table 8 Baseline program indicators – 2014

Total Immunization-specific Expenditures	$60,905,828
Campaigns	$33,796,428
Routine Immunization only	$27,109,400
per capita	$0.30
per DTP3 child	$16
% Vaccines and supplies	80.8%
% National funding	61.1%
% Total health expenditures	0.3%
% Gov. health expenditures	0.6%
% GDP	0.01%
Total Shared Costs	**$17,804,601**
% Shared health systems cost	22.6%
TOTAL	**$78,710,429**

Cost structure of Immunization Program

Figure 3 shows the cost structure of the Immunization program in baseline year. In 2014, the total cost of the Immunization Program was $78,710,429, with shared costs and $52,956,295 without shared costs. Health system shared cost, mainly personnel[33] contributed $18,009,643 (25.4%) in total program expenditure

Figure 3 Baseline – Immunization Program Cost Structure (without shared health system costs)



[33] Personnel who spent less than 100% of their time for immunization

In 2014 the EPI conducted national wide MR immunization campaign targeting 1-14 year old children in all four regions of the country (North, Centre, Highland and South regions). The campaign was implemented in all 704 districts of the country and reached coverage rate of 98.2%. The total cost of the campaign was $33,796,428. The campaign was funded by the Government and implementing partners. The government contributed $2,142,000, Gavi provided the major share of campaign costs –$31,523,121, and UNICEF and JICA contributed $31,307 and $100,000 respectively.

The analysis of the routine immunization costs showed, that in the baseline year expenditures for "vaccines" was the highest cost category among all routine immunization expenditures (80.8%). This was followed by "other routine recurrent cost component (7.82%), "Personnel" (6.55%) and "transportation" (4.81%).

Out of the total amount spent for the procurement of vaccines and injection supplies, $4,989,388 (18.4%) was allocated to the procurement of traditional vaccines, $13,402,487 (49.44%) - to the procurement of the underused vaccines and $3,502,468 (12.92%) was spent on injection supplies.

"Other routine recurrent cost component" accounting for 8% of the total expenditures included the following cost categories: "cold chain maintenance and overhead", "maintenance of other capital equipment", "building overheads", "short-term trainings", "IEC/Social Mobilization", "disease surveillance" and "program management"

The remaining of baseline costs was related to "personnel" and " transportation" costs, where personnel costs ($1,775,835) includes salaries and benefits for the full time employees, who spent 100% of their time for immunization program at all levels and transportation costs ($1,302,704) reflect expenditures for the cars that are 100% devoted to the program. Greater part of the vehicles currently used by the immunization program are shared with other healthcare programs.

The detail distribution of the routine immunization costs in the baseline year (without shared costs) is presented in the Table 9.

Table 9 Baseline – Immunization Program Cost Profile (without shared health system costs)

Cost Category	2014
Traditional Vaccines	$4,989,388
Underused Vaccines	$13,402,487
New vaccines	$0
Injection supplies	$3,502,468
Personnel	$1,775,835
Transportation	$1,302,704
Other routine recurrent costs	$2,120,693
Other capital equipment	$15,826
Supplemental immunization activities	$33,796,428

Immunization program financing baseline year

Table 10 shows the sources of the program financing in 2014 and demonstrates contribution by financing parties to the recovery of program cost (without shared costs).

Table 10 Immunization Program of Viet-Nam - Baseline Financing (routine only) – 2013 (without shared costs)

Financing Source	Financing (Routine Only)	%
Government	$14,427,582	27.21%
WHO	$509,131	0.84%
Unicef	$37,187	0.11%
Gavi	$12,135,500	71.68%

In general, the routine immunization program in 2014 was funded by four main sources, out of which Gavi played a key role covering around 71.7% of all costs. The Government contributed 27.21% and WHO and UNICEF – 0.84% and 0.11% respectively.

3.1.5. FUTURE RESOURCE REQUIREMENTS

Structure and major trends of resource requirements

Table 11 presents the summary of total estimated resource requirements by program components. Total estimated resource requirement for the Immunization Program during 2016-2020 is $273,574,049 without shared costs and $ 362,597,053 with the shared costs.

One of the most significant aspects of the program resource requirement dynamics is the rapid increase of the immunization program cost – from $46,126,825 in 2014 to $67,066,002 in 2016 (shared costs excluded). A comparative analysis of the baseline expenditures and resource requirements for the first year of projection showed that the main cost drivers is "Vaccine Supply and Logistics" component of the program. Other program components, such as "service delivery", "advocacy and communication" and "program management" experience moderate changes over the course of projection years.

Table 11 Resource requirements by Program Components by Years

cMYP Component	2014	2016	2017	2018	2019	2020	Total 2016 - 2020
Vaccine Supply And Logistics	22,478,010	42,308,285	51,347,805	48,976,949	48,951,081	49,531,711	241,115,831
Service Delivery	1,358,301	1,358,301	1,358,301	1,358,301	1,358,301	1,358,301	6,791,503
Advocacy And Communication	37,935	37,935	61,927	61,927	61,927	61,927	285,642
Monitoring And Disease Surveillance	2,246,769	2,242,595	2,242,595	2,242,595	2,242,595	11,217,149	2,246,769
Program Management	739,899	564,441	1,083,716	1,083,716	1,083,716	1,083,716	4,899,303
SIAs	33,796,428	0	11,407,178	0	0	0	11,407,178
Total Direct Costs	**60,905,828**	**46,515,731**	**67,501,521**	**53,723,486**	**53,697,618**	**54,278,249**	**275,716,605**
Shared Health Systems Costs	17,804,601	17,804,601	17,804,601	17,804,601	17,804,601	17,804,601	89,023,004
Grand Total	78,710,429	64,320,332	85,306,121	71,528,087	71,502,219	72,082,850	364,739,609

Figure 4 graphically presents the total estimated resource requirements throughout the 2016-2020 and illustrates contribution of the vaccine cost component in composition of the total resource requirements for projection period.

Figure 4 Projection of Future Resource Requirements – 2016-2020 (without shared costs)

Recurrent costs - Structure and analysis

Vaccines and injection supplies

With the introduction of the new vaccines and graduation from Gavi support, the NIP cost structure is expected to undergo substantial changes in comparison with the baseline year. Estimates of the government funding are based on the approved budget for 2016 year as well as on the assumption that the government funding for procurement of vaccines and injection supplies will be increasing annually by at least 10% during the five-year projection period.

In the baseline year, expenditures for vaccines is $22,478,010 while in the first year of projection resource requirement for vaccine procurement increases to $42,308,285. In 2017, the estimated resource requirement for vaccines continues to increase, reaching its maximum $ $51,347,805. During the last three projection years expenditures for vaccines will relatively stabilize at $ $48,976,949, $48,951,081 and $49,531,711 for 2018, 2019 and 2020 respectively.

I**n 2016** EPI plans to introduce in routine immunization schedule:

- MR and target 90% of newborns countrywide
- IPV targeting 90% of newborns countrywide

Projected coverage targets for all routine immunization vaccines are set according to the national and regional targets. In some instances the coverage targets set by EPI are lower than already achieved coverage rates, however through achieving these targets NIP still meats program objectives and ensures maximum cost effectiveness of the program.

In 2017 the EPI is planning to introduce Rota vaccine targeting 93% of surviving infants in the first year of introduction and gradually increase coverage rate by 1% in each following year reaching 90% coverage rate by 2020.

Table 12 presents the EPI coverage targets, including: actual coverage rates in the baseline year, planned new vaccine introduction (year of introduction and coverage targets) as well as details of immunization program expansion, i.e. new coverage targets for the traditional vaccines.

Table 12 Introduction of New Vaccines and Coverage Targets – routine immunization

TYPE OF VACCINE	BASELINE	PROJECTION PERIOD				
	2014	2016	2017	2018	2019	2020
BCG	96.0%	90.0%	90.0%	90.0%	90.0%	90.0%
DTP	95.0%	90.0%	90.0%	90.0%	90.0%	90.0%
TT	91.0%	80.0%	80.0%	80.0%	80.0%	80.0%
HEPB	59.0%	90.0%	90.0%	90.0%	90.0%	90.0%
JE	95.0%	90.0%	90.0%	90.0%	90.0%	90.0%
MEASLES	94.0%	90.0%	90.0%	90.0%	90.0%	90.0%
MR		90.0%	90.0%	90.0%	90.0%	90.0%
OPV	96.0%	90.0%	90.0%	90.0%	90.0%	90.0%
DTP-HEPB-HIB	95.2%	90.0%	90.0%	90.0%	90.0%	90.0%
ROTAVIRUS			93%	93%	94%	95%
TT (FOR CBAW IN HIGH-RISK AREAS)	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%
IPV		90.0%	90.0%	90.0%	90.0%	90.0%
CHOLERA	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%
TYPHOID	90.0%	90.0%	90.0%	90.0%	90.0%	90.0%

Figure 5 and Table 13 show the details of estimated resource requirements for vaccines over the course of the cMYP covered period. The share of new vaccines in the total Program cost will increase in 2017 with the introduction of Rota and MR in the routine immunization schedule, making the costs of the new and underused vaccines the main cost drivers of NIP program, significantly increasing from 55.24% in 2016 to 70.71% in the 2020.

Figure 5 Resource Requirements for Vaccines, Routine Immunization in the Projection years

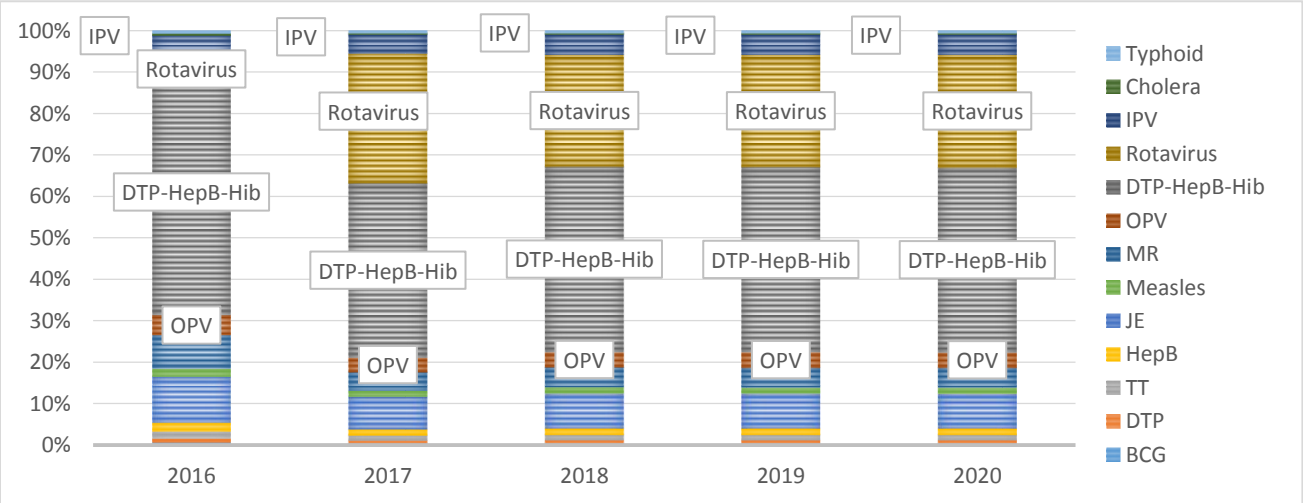
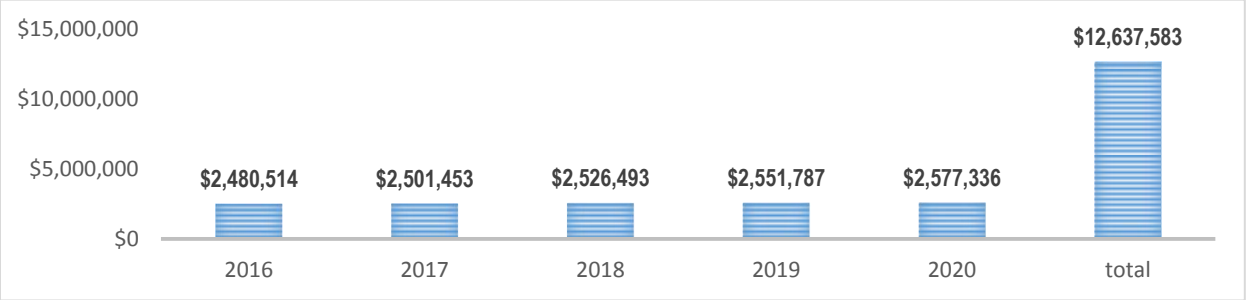


Table 13 Resource requirements by vaccines, Routine Immunization

Vaccine	2016	2017	2018	2019	2020	2016-2020	% of total cost
BCG	$242,034	$244,472	$246,941	$249,435	$251,955	$1,234,837	0.56%
DTP	$285,476	$288,352	$291,264	$294,206	$297,177	$1,456,474	0.66%
TT	$590,619	$596,570	$602,595	$608,681	$614,829	$3,013,294	1.37%
HepB	$715,258	$722,463	$729,760	$737,131	$744,576	$3,649,188	1.66%
JE	$3,737,135	$3,774,785	$3,812,910	$3,851,421	$3,890,320	$19,066,571	8.66%
Measles	$648,808	$655,345	$661,964	$668,649	$675,403	$3,310,169	1.50%
MR	$2,718,131	$2,201,958	$2,224,198	$2,246,662	$2,269,353	$11,660,302	5.30%
OPV	$1,634,997	$1,651,468	$1,668,148	$1,684,997	$1,702,015	$8,341,625	3.79%
DTP-HepB-Hib	$20,013,341	$20,214,967	$20,419,138	$20,625,372	$20,833,688	$102,106,506	46.40%
Rotavirus	$0	$14,994,463	$12,250,470	$12,458,728	$12,670,526	$52,374,187	23.80%
IPV	$2,750,490	$2,228,172	$2,250,676	$2,273,408	$2,296,369	$11,799,115	5.36%
Cholera	$187,826	$189,718	$191,634	$193,570	$195,525	$958,273	0.44%
Typhoid	$178,885	$223,607	$223,607	$223,607	$223,607	$1,073,313	0.49%

Figure 6 shows resource requirements for injection supplies throughout the cMYP period.

Figure 6 Resource Requirements for Injection Supplies, Routine Immunization 2016-2020



The share of vaccines and injection supplies procured for any campaigns conducted during the projection years will be considered as an additional expense. The cost of JE vaccine alone for the SIA campaign to be implemented in 2017 is estimated at approximately $11,407,178 (16.9% of the total program cost for the respective year), out of which $4,327,778 is planned for vaccine procurement and $780,900 - for injection equipment. Operational cost for the JE campaign is estimated at 0.65$ per vaccination.

Personnel Costs

Resource requirements for health care staff are estimated based on assumptions that there are no major staffing dynamics and/or annual increases of salary levels expected during the projection period. Estimated resource requirements for the immunization program personnel is $8,879,174.31 (3.22% of the total recourse requirement for the cMYP period). This estimate includes only full time staff dedicating 100% of their time to the immunization program. Apart from fulltime staff, there are personnel who spend a portion of their time on the immunization program. The resource requirement for the shared personnel is included in the shared health system costs. It should be noted that EPI strategies for the projection period in terms of immunization program expansion will lead to the increased workload and thus will have significant implications on the human resource requirements. Thus, it seems necessary to

assess potential/expected impact of program expansion on human resource requirement and revise staffing of the immunization program based on the assessment results.

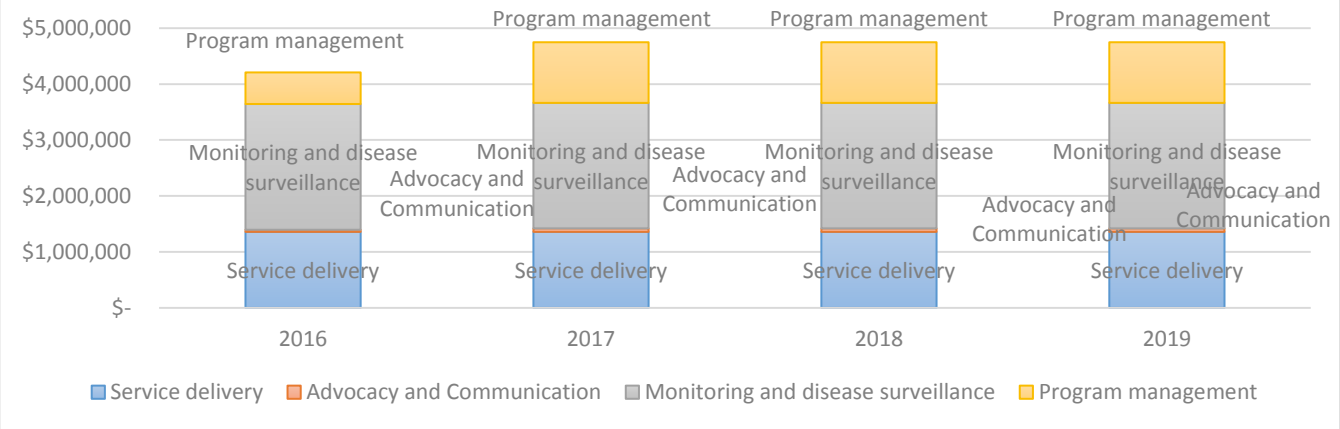
Training, program management, disease surveillance and IEC & Social Mobilization

During the projection period, resource requirements for IEC & Social Mobilization - $18,927,329, Program Management - $15,401,502, Disease Surveillance - $8,440,384 and Short-Term Trainings are estimated at $295,455.

Resource requirements for IEC & Social Mobilization cost category, which represent the part of "Advocacy and Communication" component of the immunization program gradually increases during the projection years. The rapid increase is expected in 2017 which is attributed to the introduction of the Rota vaccine and that would require additional resources. In 2014 actual expenditures for IEC & Social Mobilization was $37,935, which remains the same in the first year of projection. The cost increases up to $61,927 in 2017 that in addition to the extensive IEC&Social Mobilization activities will require implementation of the extensive communication and advocacy activities for ensuring effective introduction of Rotavirus vaccine.

Figure 7 represents dynamics of the resource requirements for Trainings, Program Management, Disease Surveillance and IEC & Social Mobilization.

Figure 7 Resource Requirements for Service Delivery, Advocacy and Communication, Monitoring and Disease Surveillance and Program Management Surveillance and IEC & Social Mobilization



Cold Chain Equipment

The introduction of new vaccines and expansion of the immunization program planned by EPI in the upcoming five-year period, suggests that the cold chain might require substantial upgrade, since the existing cold chain capacity may become the major bottleneck in implementing proposed strategies and reaching program objectives. Expansion of the immunization program considers increase of vaccine volume and thus will require significant improvement of existing storage capacity to accommodate increased volume of vaccines.

The latest EVM assessment was carried out in 2015 and produced key recommendations and improvement plan. According to the results of the EVM assessment the NIP needs to take corrective measures for ensuring sufficient capacity of cold chain through the implementation of EVM improvement plan and consideration of the EVM assessment recommendations. Additional investment in cold chain

capacity included in the cold chain improvement plan will be reflected after updating the cMYP costing tool according to the EVM improvement plan.

Vehicles and transport costs

During the projection period, the EPI does not plan procurement of the new vehicles. The estimated resource requirements of the transportation reflected in the cMYP costing tool are based on the historical costs of EPI operations. Except for pickup trucks on the National, Regional and Province levels, all vehicles that are currently used for immunization program activities are shared with other healthcare programs.

3.1.6. FUTURE FINANCING AND FUNDING GAP ANALYSIS

Error! Reference source not found. shows the future secured funding and funding gaps for 2016 – 2020. The analysis of the program financing based on only secured funding revealed significant fluctuation of the funding gap over the projection five-year period. The funding gap increases from $16,904,480 in 2016 to $24,747,025 in 2017 followed by a decrease in 2018 to $11,759,824 and stabilization in 2019-2020 at the level of $13,636,966 and $13,745,968 respectively.

The analysis of the program financing with secured and probable funding shows quite promising picture and potential of the NIP to expand its activities due to availability of surplus funds. Particularly, funding gap as low as 1% ($745,561) is observed only in the first year of projection (2016), while during the rest of four remaining years the funding surplus equal to $2,999,882 in 2017, $10,930,148 in 2018, $6,017,278 in 2019 and $5,780,102 in 2020.

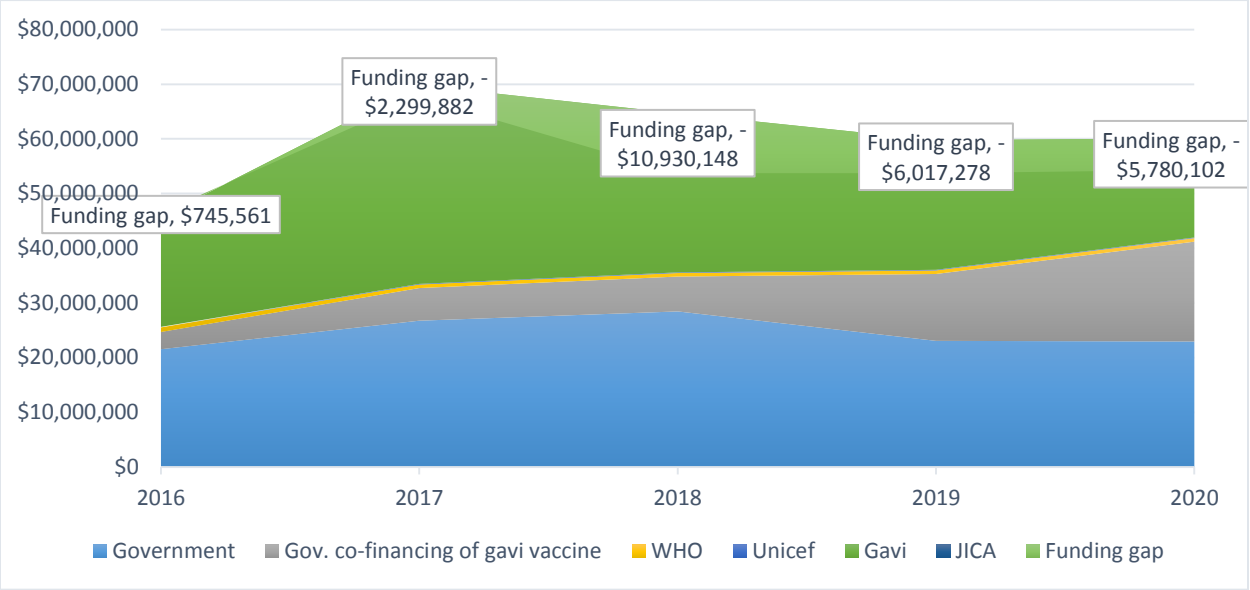
As it is illustrated in the **Error! Reference source not found.**, main source of financing of the immunization program is the Government of Viet Nam contributing $299,998,454 or 56% of the total secured and probable funding over the course of projection years, including Government commitments for financing of Gavi supported vaccines. Table 14 represents the details of Government co-financing of new and underused vaccines introduced in the routine immunization schedule. The share of financing provided by implementing partners equals to 43.82% where Gavi will provide 42.5% ($127,487,438) of total program cost. WHO will provide 1.18% ($3,530,000) and UNICEF – 0.15% ($450,000) of the total projected financing.

Table 14 Government co-financing of Gavi supported vaccines

Vaccine	2016	2017	2018	2019	2020
DTP-HepB-Hib	$2,502,274	$3,216,326	$3,736,132	$7,144,168	$10,620,665
Rotavirus	$0	$2,385,711	$2,241,494	$4,315,425	$6,459,222
IPV	$647,174	$354,516	$411,811	$787,458	$1,170,651

Overall, despite these fluctuations, the volume of the funding gap suggests that the sufficient funding has not yet been secured for implementation of the EPI strategies for immunization.

Figure 8 Future Secure Financing and Funding Gaps (shared costs excluded)



The funding gap estimated with secure and probable funds for the first year of projection equals to $745,561 or 1% of total estimated financing of the program. However, in case all probable funds are secured, the program will have surplus funds that will equal to $2.3 mln. in 2017, $10.9 mln in 2018, $6.0 in 2019 and $5.8 mln in 2020. Total amount of surplus funds during the cMYP cycle in case of securing all probable funds will be $24.3 mln.

3.1.7. Future Financial Sustainability

Total cost of the immunization in the baseline year was $72,082,850 including shared health systems cost and $60,905,828 without shared costs. Out of this amount $33,796,428 was spent for the MR SIA campaign carried out among 1-14 year old age group by the NIP. The per capita cost of the immunization program was $0.30 and cost per DTP3 child was $16.

Total estimated resource requirement for 2016-2020 period equals to $275,716,605 (without shared health system costs). The resource requirement will increase from $46,515,731 in 2016 to $67,501,521 in 2017 due to the introduction of new vaccines in the national immunization program. The cost of the Supplementary Immunization Activities during the projection five-year period was estimated at $11,407,178 for implementation of the MR SIA campaign.

Vaccines and injection supplies cost component is the main cost-driver of immunization program resource requirements.

The greater part of the immunization program funding is provided by the Government of Viet Nam. Development partners, such as GAVI, WHO and UNICEF provide critical support for vaccine procurement and financing of trainings, disease surveillance and IEC & Social Mobilization components of the program.

Estimated resource requirements for vaccines, injection supplies and program financing ***with secure funding only*** is unbalanced and contribute to the development of the significant funding gap ranging from 22% in 2018 to 37% in 2017, that puts under the question feasibility and affordability of the

strategies elaborated for achieving during the projected year threatening achievement of established goals and making impossible to maintain high immunization coverage in the country, that in turn puts under the risk increase of VPD control to ensure contribution of immunization program to the Viet Nam's overall health and development goals.

However, estimated resource requirements are fully met with secured and probable funding and in case of securing all probable funds, the program will have budget surplus that could be used for further development of program activities, expanding them to hard-to-reach areas or to the improvement of existing components of program and thus overall program performance. In case of realization of all probable funding the only modest funding gap of 1% was estimated in 2016, while in all remaining years the surplus funding will be available for the program – $2.29 mln in 2017, $10,93 mln in 2018, $6.01 mln in 2019 and $5.78 mln in 2020. The total surplus for the five year period will be equal to $24.28 mln.

Recommendations for addressing funding gap implications

These findings call to putting major emphasis to the securing probable funding through the design and implementation of advocacy strategy among the key decision makers at the national level as well as among the implementing partners.

In order to ensure financial sustainability of the immunization program and further advance the program development it is recommended to design and implement following activities:

- Plan and implement resource mobilization strategy targeting the Government and international donor organizations, including:
  - Development of the effective communication plan, including communication activities at all levels;
  - Development and implementation of the program advocacy plan, including the fundraising plan for securing need financial resources for the program implementation.
- Revision of some targets and planned interventions to match resource requirements with secured financing

Annexes

ANNEX 1 – RESOURCE REQUIREMENTS FOR CMYP 2016-2020

	Expenditures	Future Resource Requirements					Total
Routine Recurrent Costs	2014	2016	2017	2018	2019	2020	Total 2016 - 2020
Vaccines (routine vaccines only)	$18,391,875	$33,702,999	$47,986,339	$45,573,306	$46,115,867	$46,665,343	$220,043,854
Traditional	$4,989,388	$8,221,037	$8,346,780	$8,428,824	$8,511,696	$8,595,406	$42,103,743
Underused	$13,402,487	$20,013,341	$20,214,967	$20,419,138	$20,625,372	$20,833,688	$102,106,506
New	$0	$5,468,621	$19,424,593	$16,725,344	$16,978,798	$17,236,249	$75,833,605
Injection supplies	$3,502,468	$2,480,514	$2,501,453	$2,526,493	$2,551,787	$2,577,336	$12,637,583
Personnel	$1,775,835	$1,775,835	$1,775,835	$1,775,835	$1,775,835	$1,775,835	$8,879,174
Salaries of full-time EPI health workers (immunization specific)	$55,596	$55,596	$55,596	$55,596	$55,596	$55,596	$277,982
Per-diems for outreach vaccinators/mobile teams	$0	$0	$0	$0	$0	$0	$0
Per-diems for supervision and monitoring	$1,720,239	$1,720,239	$1,720,239	$1,720,239	$1,720,239	$1,720,239	$8,601,193
Transportation	$1,302,704	$1,302,704	$1,302,704	$1,302,704	$1,302,704	$1,302,704	$6,513,521
Fixed Site Strategy (Incl. Vaccine Distribution)	$1,302,704	$1,302,704	$1,302,704	$1,302,704	$1,302,704	$1,302,704	$6,513,521
Outreach strategy	$0	$0	$0	$0	$0	$0	$0
Mobile strategy	$0	$0	$0	$0	$0	$0	$0
Maintenance and overhead	$1,082,520	$1,357,891	$1,374,692	$1,391,828	$798,106	$803,711	$5,726,229
Cold chain maintenance and overhead	$564,655	$840,026	$856,827	$873,964	$280,242	$285,847	$3,136,905
Maintenance of other capital equipment	$3,186	$3,186	$3,186	$3,186	$3,186	$3,186	$15,929
Building Overheads (Electricity, Water…)	$514,679	$514,679	$514,679	$514,679	$514,679	$514,679	$2,573,394
Short-term training	$45,175	$45,175	$0	$0	$0	$0	$45,175
IEC/Social Mobilization	$37,935	$37,935	$61,927	$61,927	$61,927	$61,927	$285,642
Disease Surveillance	$775,017	$526,531	$522,356	$522,356	$522,356	$522,356	$2,615,956
Program management	$180,046	$4,587	$569,037	$569,037	$569,037	$569,037	$2,280,734
Other routine recurrent costs	$0	$0	$0	$0	$0	$0	$0
Subtotal	$27,093,575	$41,234,171	$56,094,343	$53,723,486	$53,697,618	$54,278,249	$259,027,867
Vehicles (100% EPI)	$0	$0	$0	$0	$0	$0	$0
Cold chain equipment	$0	$5,281,560	$0	$0	$0	$0	$5,281,560
Other capital equipment	$15,826	$0	$0	$0	$0	$0	$0
Buildings Construction (100% EPI)	$0	$0	$0	$0	$0	$0	
Subtotal	$ 15,826	$ 5,281,560	$ -	$ -	$ -	$ -	$5,281,560

ANNEX 2 – GLOBAL REGIONAL AND NATIONAL GOALS

GVAP Goals 2011-2020	Global and regional immunization goals (until 2020)	National objectives based on global and regional goals in Viet Nam cMYP 2016-2020
1. Achieve world free of poliomyelitis	**1. Sustaining polio free status**	**Maintain polio-free status, validated in 2005**
2. Meet global and regional disease elimination targets (includes neonatal, tetanus, measles and rubella elimination targets)	**2.** Maternal and neonatal tetanus elimination	– Control of Diphtheria – Control of Pertussis
	3. Measles elimination	– Measles elimination in 2017
	4. Rubella elimination	– Rubella elimination in 2017
	5. Hepatitis B accelerated control	– Control of Hepatitis B
	6. Accelerated control of Japanese Encephalitis	– Reaching over 90% coverage of three doses of Japanese encephalitis vaccine for children 2-5years of age
3. Meet vaccination coverage targets in every region, country and community	**7.** Meeting regional vaccination coverage rates	– Maintain >95% coverage for all antigens at national level, and maintain 90% DPT3 coverage in every district through-out the plan period
4. Develop and introduce new and improved vaccines and technologies	-	– Introduction of IPV vaccine; and – Introduction of Rotavirus vaccine in the routine immunization schedule of the country

5. Exceed MDG4 target for reducing child mortality		Reaching over 90% coverage of fully immunized child (FIC) for children under 1 year of age