PAPUA NEW GUINEA

Comprehensive EPI Multi-Year Plan FOR NATIONAL IMMUNIZATION PROGRAMME

2016-2020

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NATIONAL DEPARTMENT OF HEALTH

PORT MORESBY

PAPUA NEW GUINEA

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List of abbreviations and Acronyms

AEFI	Adverse Events Following Immunization
AFP	Acute Flaccid Paralysis
AMS	Area Medical Store
BCG	Bacillus Calmette-Guérin
CHW	Community Health Worker
cMYP	Comprehensive Multi-Year Plan
DFF	Direct Facility Funding
DNPM	Department of National Planning and Monitoring
DoT	Department of Treasury
DP	Development Partner
DPT3	Third dose of Diphtheria, Pertussis (whooping cough) and Tetanus vaccine
DQS	Data Quality Self-Assessment
DSIP	District Service Improvement Program
EPI	Expanded Programme on Immunization
FAQs	Frequently Asked Questions
FBB	Facility Based Budgeting
FHSSIP	Family Health Service Strategic Implementation Plan
GAVI	Global Alliance for Vaccines and Immunization
GIVS	Global Immunization Vision and Strategy
HDI	Human Development Index
HepB	Hepatitis B Vaccine
HFG	Health Function Grant
HFs	Health Facilities
Hib	Haemophilus Influenza type b
HWs	Health Workers
ICC	Interagency Coordination Committee
IDSR	Integrated Disease Surveillance and Response
IMR	Infant Mortality Rate
IMR	Institute of Medical Research
KRA	Key Result Area
M&E	Monitoring and Evaluation
MDGs	Millennium Development Goals
MMR	Maternal Mortality Ratio
MNTE	Maternal and Neonatal Tetanus Elimination
MPA	Minimum Priority Area
NAC	National Aid Council
NDHS	National Demographic and Health Survey
NDoH	National Department of Health
NEC	National Executive Council
NEFC	National Economic and Fiscal Committee
NHA	National Health Accounts
NHMIS	National Health Management Information System
NHP	National Health Plan
NICS	National Immunization Coverage Survey
NNT	Neonatal Tetanus
OPV	Oral Polio Vaccine
PGK	Papua New Guinea Kina
PHA	Provincial Health Authorities
PHC	Primary Health Care
PIP	Public Investment Program

AEFI	Adverse Events Following Immunization
PNG	Papua New Guinea
PNG PEGS	Polio Eradication End Game Strategy of Papua New Guinea
PSIP	Provincial Service Improvement Program
RI	Routine Immunization
SIA	Supplemental Immunization Activity
SSG	Special Support Grant
TT	Tetanus Toxoid
U5MR	Under Five Mortality Rate
UNICEF	United Nations Children's Fund
VAR	Vaccine Arrival Reporting
VDPV	Vaccine Derived Polio Virus
VPD	Vaccine Preventable Diseases
VVM	Vaccine Vial Monitor
WHA	World Health Assembly
WHO	World Health Organization
WICR	Walk in Cold Room
WPV	Wild Polio Virus

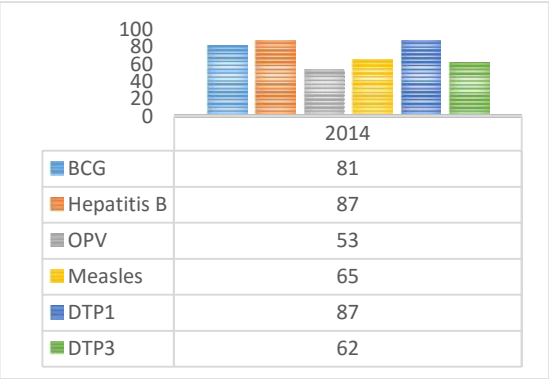
Executive Summary

Immunization Situation Analysis: Summary 2011-2015

Immunization Achievements

- Interruption of transmission of the Wild Polio Virus
- Introduction of IPV and PCV Vaccine
- Availability of potent and bundled vaccines
- Implementation of the National Health Plan
- Development of SIREP and SIREP Plus Strategies

Immunization Coverage



Immunization System Analysis

- Poor coordination between National and sub-national EPI
- Low motivation for RI
- Weak HMIS and unreliable statistics
- High dropout rates between successive vaccine doses due to lack of validation of data in field
- Lack of service providers in the rural areas
- Lack of qualification of the front line service providers
- Aging cold chain equipment

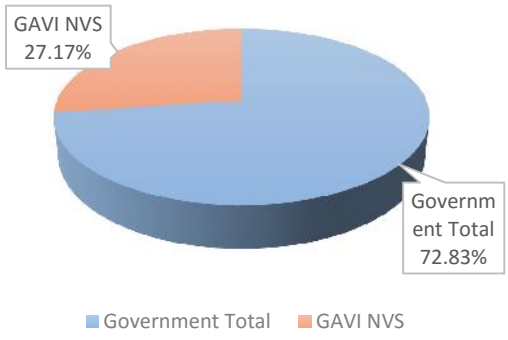
Health System Constraints

- Inadequate skilled health care workers in the rural areas
- Mal-distribution of health workers
- Inadequate vaccine management practices
- Inadequate reporting and surveillance systems
- Sub-standard reporting stkills

Baseline Costing Profile

Baseline Indicators	2014
Total Immunization Specific Expenditures	$7,646,029
Supplemental immunization activities	$0
Routine immunization only	$7,646,029
Per capita	$1.05
Per DTP3 immunized child	$56
% Vaccines and Supplies	69.9%
% Government Funding	27.7%
% Of Total Health Expenditures (THE)	1.1%
% Government Health Expenditures	1.4%
% GDP	0.0%
Total shared costs	$99,377
% Shared Health Systems Cost	1.3%
Total Immunization Expenditures	$7,745,407

Baseline Financing Profile



cMYP Summary 2016-2020

National immunization Priorities

- Increase routine immunization coverage for all antigens to reach every child and mother, especially in hear-to-reach areas
- Improve cold-chain operations at all levels
- Advance towards measles elimination
- Control hepatitis B
- Eliminate Maternal and neonatal tetanus
- Maintain PNG's polio free status
- HPV introduction into the RI Schedule
- Improve existing surveillance and data management systems
- Ensure participation and mobilization of communities in EPI

Immunization priority objectives

- Increase control of VPD diseases
- Increase coverage and equity of RI
- Improve service delivery practices
- Ensure community participation in RI service promotion
- Improve surveillance of VDP diseases and AEFI
- Improve effective vaccine management
- Improve monitoring and reporting of immunization services
- Increase sustainability of immunization financing

National Program Monitoring Framework

Indicator	2014	2020
BCG	81%	95%
Hepatitis B	87%	95%
OPV13	53%	95%
Measles	65%	95%
MR	n/a	95%
Penta	62%	95%
TT	50%	95%
PCV	n/a	95%
HPV	n/r	70%
IPV	n/a	95%
Fully immunized children	62%	95%

Priority Immunization Program Strategies

- Streamline EPI management structures
- Improve immunization delivery through:
- increasing skilled immunization staff
- ensuring micro-planning in health facilities
- Upgrade of physical infrastructure and logistics
- Increase sustainability of immunization through improved planning and budgeting
- Increase political and public awareness of the importance of immunization through evidence based advocacy, communication and social mobilization activities

Major Risks and Challenges

- Securing Sufficient funding for the immunization program
- Development, implementation and monitoring of micro-plans
- High dependency on donor funding
- Inadequate distribution of health personnel
- Low motivation of health workers for RI service provision

Health and Development Impacts

- Improved child survival through contribution to achievement of SDGs
- Reduced disability in the community associated with VPD)
- Use of immunization as a strategic component of poverty reduction initiatives through improved child survival

Costs and Financing Projections

	2016	2017	2018	2019	2020	Total
Total Resources Required (US$ millions)	12.5	16.3	21.4	22.1	20.9	93.3
Cost per capita	1.47	1.88	2.08	2.38	1.89	1.95
Total Secure Financing (US$ millions)	10.9	8.4	8.1	9.2	9.7	46.6
Funding Gap (with secure) (US$ millions)	1.5	7.9	13.3	12.9	11.2	46.7
Total Secured and probable financing (US million)	10.9	9.4	15.3	11.6	17.2	64.4
Gap (with secure + probable) (US$ millions)	1.44	6.9	6.0	10.5	3.7	28.5
% of total needs	12%	42%	28%	47%	18%	31%

1 Situation analysis

1.1 Background information

1.1.1 Landscape and infrastructure

Papua New Guinea (PNG) is a member country of the Western Pacific Region. Lying south of the equator, 160km north of Australia, PNG is part of an arc of mountains stretching from Asia, through Indonesia into the South Pacific, and consists of more than 600 islands.

Access to widely scattered rural communities with more than 800 languages, distinct culture and social structure (86% of the country's population is living in rural areas) is often difficult, slow and expensive in PNG. Only 3% of the roads are paved and many villages cannot be reached by car and the most travel between provinces is by air. The capital, Port Moresby, is not linked by road with the rest of the country.

1.1.2 Administrative and political structure

Papua New Guinea is divided administratively into four regions (Southern Coastal (Papuan) Region, Northern Coastal Region, Highlands Region, and New Guinea Islands Region), 22 provinces and 89 districts. The governance structures are decentralized. The provinces make decisions independently on the types of services and operational mechanisms to deliver all public services to the population.

The governance system is a parliamentary democracy based on the Westminster model. PNG is a member of the Commonwealth and the head of the Independent State of Papua New Guinea is Queen Elizabeth II of the United Kingdom of Great Britain and Northern Ireland, represented by the Governor-General. The Governor-General is elected by the National Parliament for a five-year term.

The current single-chamber Parliament is comprised by 109 members and includes representatives from each of the twenty-two provinces and the National Capital District (one representative from each province), as well as representatives of the 89 districts of the country (one representative from each district). Every five years, the political leaders are elected at the two tiers of government: national and local. At the subnational level, there are three levels of administration: provincial, district and local (including several communities, with their villages).

1.1.3 Security

The crime in Papua New Guinea (PNG) is rated as critical and is considered among the highest in the world.

Carjacking, armed robberies, and stoning of vehicles are common problems in/around major cities but can also occur elsewhere. The high rate of crime, to include those committed by the infamous gangs, are opportunistic in nature. Sophisticated criminal enterprises do exist, and their capabilities often exceed that of local enforcement authorities.

Visiting unguarded public sites (parks, golf courses, beaches, cemeteries) is dangerous. Incidents have happened at all hours in these locations. In Port Moresby, robberies have occurred around 'Parliament Haus' on the weekends when it is unguarded.

Travel on highways outside of major towns is hazardous. There is no countrywide road network, and most roads, especially in rural areas, are in a poor state of repair. Other common safety risks include erratic/drunk drivers, poorly maintained vehicles, rock throwing, and over-crowded vehicles. Sabotage of roads by disgruntled workers is common. During the rainy season, landslides occur on some stretches of the Highlands Highway between Lae and Mount Hagen. Potholes and road erosion necessitate that vehicles travel slowly and attentively. Further, killing a dog/pig is almost certain to trigger a demand for monetary compensation, so exercise caution when driving through rural areas.

Motor vehicle accidents are a common cause of serious injury. Accidents involve vehicles traveling on the wrong side of the road in an attempt to avoid potholes. After an accident, crowds can form quickly and may attack those whom they hold responsible by stoning and/or burning vehicles. Friends and relatives of an injured person may demand immediate compensation from the party they hold responsible for injuries, regardless of legal responsibility.

While public transportation options are available, it should be avoided due to the density of passengers and lack of reliable and safe services.

Tribal warfare occasionally resembles indigenous terrorism, but it is usually carried out on an individual-to-individual scale. Tribes often battle each other with traditional and conventional weapons over land, water, livestock, and marriages. One act of violence often draws a retribution attack.

Security will remain an important issue in coming years. The crime in the country, due to its opportunistic nature can target as foreigners as the local population, including health workers engaged in health and public health service provision.

1.1.4 Demography

The data used for projections of population targets is based on the 2011 National Population and Housing Census. In 2011 population of the country was 7,275,324 people, showing 40% increase from the population count carried out in 2000.

There are more than 800 languages, over 1000 dialects and many ethnic groups, sub-ethnicities, clans and sub-clans spread across the 22 provinces of the country. Each language group have a distinct culture, and there are large sociocultural differences between and within provinces. The official languages on PNG are English, Pidgin and Motu.

The annual population growth in PNG has increased steadily from 2.2% in 1980 and currently stands at 3.1%. Within the period of 34 years the population of PNG has more than doubled from approximately 3 million (in 1980) to 7.98 million in 2014 (baseline year). The birth cohort in baseline year (2014) was estimated as 255,500 children.

The population of PNG is unevenly distributed across the country. About 39% of the population lives in the Highlands region followed by Momase region with 26% of total population, while Southern and Island regions make up 20% and 15% respectively. Out of the 22 provinces, Morobe province alone contains almost 9.3% of the country's total population, reporting a total

population count of 674,810 individuals.[1] Eastern Highlands and the Southern Highlands (excluding Hela province) are the other two most populated provinces with population in excess of half a million.

A significant increase in population is noted mostly in provinces in the Highlands and Islands. However, this is not the case for the provinces in Momase region where the population growth rate is comparatively lower.

The population of PNG is predominantly young with approximately only 13.4% of the total population aged 45 years and above; 40% of total population - under 15 years of age and 11.7% - under 5 years of age. Women of child bearing age (15-44 years)[2] account for 24.3% of the total population and children less than 1 year accounts for 2.4% of total population. Sex ratio[3] remained steady at 108 as reported in the last census. The average household (HH) size is 5.3 persons, showing a slightp increase from 5.2 persons reported in 2000 census.

Figure 1: Demographic profile of PNG in 2014 (baseline year for cMYP projections)

Demographic Profile	Urban	Rural	Total
Population	918,741	6,562,437	7,630,741
Women of Child Bearing Age	183,307	183,307	213,148

Source: EPI, National Health Plan 2011-2020, National Census 2011

1.1.5 Social and economic context

During the 1990s, economic performance was mixed, although the economy benefited greatly from major mining and petroleum projects. While there was the potential for economic and social development, the period was largely characterized by negative economic growth and macroeconomic instability. As a result, the economy grew very little in real terms, with growth in the non-mining sector more sluggish than that in the mining sector. The reasons for the economic stagnation were complex. External contributing factors included the worldwide economic depression, the negative development in commodity prices, and unfavourable trade conditions, among others, while internal factors included a series of inappropriate policy regimes and fiscal failures, the catastrophic civil war in Bougainville from 1989 to 1999, and a series of devastating man-made regional disasters.

The country's irregular economic growth showed a decrease until 2003 and a sudden very high increase the next year. Since then, the country's annual GNI growth has ranged from 570 US$ in 2004 to 2,240 US$ in 2014.

(1) Poverty

According to the World Human Development Report 2015, with a Human Development Index (HDI) of 0.505, PNG is ranked 158 among 188 countries of the world with a GDP per capita of 2,145[4] US$. It is estimated that 37% of the PNGs population live below the national poverty line and PNG is one of the poorest countries in Asia and indeed the world. Currently, with support provided by the international development partners[5] the government of the Papua Guinea is formulating,

[1] 2011 Census data

[2] According to the PNG definition the CBAW are in country is between 15 and 44 years.
[3] Number of males to every 100 females
[4] United Nations Development Fund (2015). Human Development Report 2015 – Work for Human Development.
[5] UNDP

implementing and monitoring national development plans and strategies to achieve the Sustainable Development Targets of 2030.

On account of their poor socio-economic status, the general population in PNG is vulnerable to health-related financial catastrophes and one small shock has the potential to move many individuals into poverty, which makes them more dependent upon public sector health services.

(2) Literacy

The ability to read and write is an important personal asset, increasing an individual's opportunities in life. In addition, literacy statistics can help program managers, especially those working in health and family planning, determine the best ways to reach women and men with their print messages.

Adult literacy rate in PNG is 62.9% (15 years and above). Among the young population, females are much more likely to be literate than males 75.8% vs. 66.8%. In general, 11.1% of population, older than 25 years had at least some secondary education[6].

1.1.6 Public expenditure management

In 2012, the Government of PNG introduced several important budget reforms. The reforms include a single unified or consolidated budget, a sector wide approach, rolling 3-year forward estimates and performance-based budgeting. The reforms were enacted by the National Executive Council (NEC).[7] NEC is led by the Prime Minister and is comprised by key Cabinet Ministers.

The Government's fiscal policy objectives are set out in the Medium Term Debt Strategy, the Medium Term Fiscal Strategy and the Fiscal Responsibility Act 2013.

In 2014, National Department of Health (NDoH) was nominated as the 'lead' agency for the health sector budget. As lead agency NDoH has three key responsibilities including:

- Development and submission of the budget on behalf of all agencies and stakeholders of the health sector, such as Provincial Health Authorities, Hospitals, Church Health Services, Rural Health Services (through Health Functional Grants), the Institute of Medical Research (IMR), the National Aids Council (NACs), and Development Partners (DPs);
- Development and submission of the expenditure and performance reports to the Department of Treasury (DoT) for quarterly reviews; and
- Development of non-financial information about the health sector. The non-financial information is submitted upon request to: the DoT, Central Agencies' Coordinating Committee, the Office of the Chief Secretary, Parliament and the National Executive Council.

The health sector is one of four sectors piloted for this approach along with the Transport, the Education and the Law and Justice Sectors.

In 2015, the Government launched a two-stage budget review process aiming at improving macro-fiscal discipline as part of a Medium Term Budgeting Framework. Through this new procedure the government determines financial allocations for the agencies and sectors through setting a top-

[6] Human Development Report 2015
[7] Decision No. 113/2012

down indicative (or macro-fiscal) ceiling for operational and capital investment budget for each agency and analysis of the bottom-up estimates which are prepared and submitted by each sector on behalf of all sector agencies. These estimates include new and ongoing priorities of the sector.

The indicative ceilings for operational and capital investment budgets of the public agencies are set by the Department of Treasury for each agency individually.

NDoH is responsible for ensuring that all health sector agencies submit their budget proposals within the ceilings provided. The established agency ceilings, disables the health sector to determine the allocation of resources across agencies within the sector.

For further contributing in improved management of public sector budgeting the government introduced new "Consolidated Budget Operating Rules (CBORs). All government agencies are required to comply with the budget operating rules included in the CBORs.

The two primary objectives of the CBOR are:

- To support the government 's fiscal framework by ensuring that public expenditure is controlled to improve efficiency and minimize waste and duplication; and
- To provide guidance and incentives for government agencies and provincial administrations to manage their expenditures well and provide services that are value for money for all the people of Papua New Guinea.

Through introducing of CBORs the government ensures:

- Affordable and sustainable public finances that support confidence in the economy and promotes equity and fairness in the delivery of government services; and
- Existence of a clear link between the allocation of government resources and the policies, plan and priorities of the Government of Papua New Guinea.

DoT and DNPM are two key agencies responsible for the design and annual update of the budgeting rules and submission of the updated rules for endorsement by Budget National Executive Council. In addition, the DoT is responsible for administration of the recurrent budget and the DNPM is responsible for administration of the development budget.

Historically, the PNG government followed the calendar year for preparation of budgets and other financial statements. The Budget preparation cycle starts in March of every year and is comprised of following main phases:

1 Submission of the first draft of the budget: Preparation of the sectoral budget proposals by the government agencies based on identified priorities and submission of these proposals to the DoT and DNPM (by May of each year).

2 Establishment of individual ceilings for agencies: Based on review of budget proposals from Agencies the DoT and DNPM establish and issue Expenditure Ceilings and Funding Cups to agencies for inclusion in the budget submissions. The operational ceilings and funding cups are issued through the Budget Circulars and in sufficient time for agencies to develop their policy program for the budget year and prepare budget submissions. Agencies must adhere to operational and capital expenditure thresholds. The Government's budgeting policy requires agencies to manage two types of expenditures a) operational – ongoing running costs, including

personnel salaries, goods and services and ongoing maintenance and costs of ongoing capital projects; and b) Capital – for new investment projects and programs.

3 Development and submission of the integrated budget by agencies: In July of each year the agencies prepare one integrated budget submission, containing both operational and capital expenditure, for consideration in budget process. Operational and Capital expenditure figures must reflect multi-year budgeting, including the Budget and estimates for three forward years, which are regarded as basis for their forward planning and thus have to accurately reflect the expected expenditure profile.

4 Development of the Consolidated State Budget: The Consolidated State Budget is developed by the DoT and DNPM. The budget is submitted to the National Commission – comprised by the key portfolio ministers and let by the Prime Minister;

5 Submission of the budget to the National Executive Council for final approval.

Since 2015, the National Agencies have not been funded for the projects that don't have nation-wide impact and thus all sub-national projects are funded through the Service Improvement Programs (SIPs). Therefore, the Agencies ensure that any budget request for additional operational funding, which is above the allocated ceiling, aligns with the Government's devolved National-Subnational funding model.

1.2 Health care system analysis

1.2.1 Population health

In PNG childhood mortality has considerably declined at all levels. The dynamics of neonatal, infant and under 5 mortality rates during the last decade is shown in Figure 2 below: [8]

Figure 2: Trends in childhood mortality in PNG (2004-2014)

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Infant Mortality rate (per 1,000 live births)	56.2	55.6	54.7	53.8	52.7	51.6	50.3	49.2	48	47	45.7
Under-5 mortality rate (per 1,000 live births)	75.2	74.2	72.9	71.5	69.7	67.9	66.1	64.3	62.5	60.9	59.1
Neonatal Mortality rate (per 1,000 live births)	29.5	29.2	28.9	28.5	28.1	27.7	27.1	26.5	26	25.4	24.9

Source: PNG – WB WDI 2016

Over the last 10 years, preceding the baseline year (2014) Infant mortality declined by 19 percent, from 56.2 deaths per 1,000 live births in in 2004 to 45.7 deaths per 1,000 live births in 2014. Under-5 mortality declined by 21 percent over the same period; from 75.2 deaths per 1,000 live births in 2004 to 59.1 deaths per 1,000 live births in 2014. Finally, neonatal mortality decreased by 16 percent – from 29.5 deaths per 1,000 live births (2004) to 24.9 deaths per 1,000 live births (2014). However, there is no clear estimate on how much of the decline in infant mortality is due to immunization alone.

[8] WB WDI 2016

1.2.2 Governance

(1) Policy environment

The roles and responsibilities of various actors in the health sector are set out in a number of guiding legislative documents, such as "The National Health Administration Act, Public Hospitals Act, Provincial Health Authority Act, Christian Health Services of PNG Act and the Organic Law on Provincial and Local-Level Governments. These are the key legal documents underpinning the structure of the PNG health system, guiding relationships between players at different levels of the health system and determining responsibilities of each player.

The National Health Administration Act (1997) establishes the National Health Plan (NHP) as a single national health policy in PNG. It applies to the entire country including Provincial and Local-Level Governments. A National Health Plan for 2011-2020 was developed and endorsed by National Executive Council. The Plan was successfully launched by the Deputy Prime Minister of PNG in August 2010. The NHP provides the broad goals, strategies and interventions for the health sector and the main goal of the NHP is *'Strengthened Primary Health Care to all and Service Delivery to the rural majority and urban disadvantage'*.

The NDoH is responsible for setting of policies and standards and providing technical advice and monitoring.

For achieving objectives of the NHP, the NDoH initiated "The Provincial Health Authority (PHA) Reform" to combine provincial health management in a distinct entity and to empower provincial managers for service delivery improvement and offer provincial health authorities holistic and predictable management of financial resources and mechanisms.

(2) Health care system development agenda

There are four key documents guiding the health care system development agenda in Papua New Guinea: National Strategic Plan (NSP); A Long Term Development Strategy (LTDS) 2010-2030; National Health Plan and Family Health Services Strategic Implementation Plan.

National Strategic Plan (NSP) – 2010-2050 – developed by the Government of PNG, provides the next forty-year vision and framework for long range planning.

A Long Term Development Strategy (LTDS) 2010-2030 – aims at linking the principles and focus areas of the NSP and providing policy direction and sectoral interventions with clear objectives, quantitative targets and baseline indicators. To achieve the intended long term goal, the LTDS proposes five broad strategies which will be detailed in four (4) Medium Term Development Plans (MTDP) over the next twenty years.

National Health Plan – 2011-2020 – was developed by the Government of Papua New Guinea and aims to direct the health sector improvement for the first ten years of the long-term strategy and vision. The NHP was mandated by the Government as a single governing policy document for the health care sector of PNG. The NHP is the sixth document developed and adopted by the country since its independence and is important roadmap for the PNG health sector.

The following Vision, Mission Statement and the Overarching Goal for the National Health Reform were formulated by the Government of PNG in the National Health Plan:

- **Vision** - "A healthy and prosperous nation that upholds human rights and our Christian and traditional values, and ensures: Affordable, accessible, equitable and quality health services for all citizens".
- **Mission** - "Improve, transform, and provide quality health services through innovative approaches supporting primary health care and health system development, and good governance at all levels".
- **The Overarching goal** of the NHP is "Strengthened primary health care for all, and improved service delivery for the rural majority and urban disadvantaged".

The NHP serves as the overarching framework for health development in PNG and draws inspiration from 22 Provinces. Specific objectives and strategies of the NHP are outlined in the Figure 3 below:

Figure 3: Specific Objectives and Strategies of the NHP 2011-2020

Specific Objectives	Strategies
1. Meeting vision 2050 and International Obligations	1.1. Achieving MDG targets by 2020 1.2. Helping PNG to move from 148 to 50 on Human Development index by 2050
2. Improving Service Delivery through implementation of following activities	2.1. Roll-out the new vehicle for improved service delivery – the Provincial Health Authority to all provinces 2.2. Build at least two community health posts (including health workers skilled in midwifery) in each district 2.3. Rehabilitate all current health centers and district hospital infrastructure 2.4. Ensure every health center and district hospital within PNG has running water and sanitation facilities 2.5. Re-equip every facility within PNG with essential equipment 2.6. Enhance four hospitals (Mount Hagen, Angau, Nonga, and Port Moresby General) to strengthen regional services and increase their recurrent resources by 20% 2.7. Redevelop the following provincial hospitals - Angau, Kerema, Goroka, Nonga, Boram, Kavieng, Popendett a, Wabag, and Daru 2.8. Enhance two district hospitals to provincial hospital standards, for Jiwaka and Hela Provinces 2.9. Undertake emergency minor works in all other provincial hospitals 2.10. Establish specialized national hospital functions in four provincial/regional hospitals for cancer infectious diseases, non-communicable diseases and trauma 2.11. Undertake redevelopment works at the Port Moresby General Hospital 2.12. Use the first Public-Private Partnership arrangement to build a new (national) referral public hospital for PNG within the National capital District.
3. Strengthen Health Systems	**Workforce** 3.1. Increase the numbers of skilled medical officers, nurses, and other health workers in provincial and rural areas by at least 30% over the period of the plan 3.2. Implement workforce policies and training development strategies to increase Doctor, Health Extension Officer, Nurse, Community Health Worker, and

	Allied Health Worker employment and career path opportunities across the health sector 3.3. Develop retention incentive for health workers, through initiatives such as The Hope Ownership Scheme in metropolitan areas, and address the staff housing shortage in remote rural areas **Financing** 3.4. Sponsor reviews during the life of this plan to evaluate the options for health insurance financing mechanisms, to improve the affordability of accessing specialized medical services or procedures **Information Communication Technology (ICT)** 3.5. Invest in ICT infrastructure, both within the hospitals and across Provincial Health Authorities, to improve service delivery and management of health resources 3.6. Support investment in the institute of medical research to improve capacity to conduct or support applied medical research of benefit to the people of PNG **Drugs and Medical Supplies** 3.7. Roll-out an interim solution of 100% health centre and aid posts kits unit 2015 3.8. Establish robust procurement, storage and distribution systems to ensure every facility, every day, has essential drugs and supplies **Leadership and Governance** 3.9. Deliver in-service (front-line support) courses to 89 district Health Managers
4. Address Health Challenges	4.1. Save a mother from dying every 12 hours 4.2. Deliver a safe and supervised delivery environment at all health centers and Community Health Posts 4.3. Every facility every day will have capacity to provide family planning services 4.4. Save a children every two hours from dying from treatable or preventable causes **4.5. Move the immunization coverage rate from 63% to 95%** 4.6. Reduce the number of people dying from malaria, HIV and TB 4.7. Contain outbreaks of diseases, and renal disease, through enhanced health awareness campaigns and accelerated roll-out of healthy Islands concepts 4.8. Establish the National Institute of Public Health, incorporating centers for disease control and Health Policy Management.

Meeting of international obligations through achievement of the health-related Millennium Development Goals (MDGs), namely reduce by three quarters the maternal mortality ration by 2015 and achieve by 2015 universal access to reproductive health, the country was unable to show significant progress in achievement of these goals as it is represented in Figure 4 below:

Figure 4: Indicators and targets for MDG4 and MDG5

MDG and indicators	Baseline (2011)	Target (2030)
MDG4: Reduce child mortality		
Under 5 mortality rate (per 1000 live births)	75	20
Infant mortality rate (per 1000 live births)	57	17
MDG5: Improve maternal health		
Maternal Mortality Ratio (in 100,000)	733	100

MDG and indicators	Baseline (2011)	Target (2030)
Births attended by skilled health personnel (%)	39	95
Antenatal Coverage (at least one visit)	63	100

Source: EPI PNG

Family Health Services Strategic *Implementation Plan (FHSSIP) – 2016-2020* – was developed by the Public Health Department of the National Department of Health based on and in line with the findings and recommendations of the Mid-term review of the National Health Plan 2011-2020. FHSSIP is the summary of detailed strategies that are already in the individual policies and plans of six programs within the Family Health Service Branch, including EPI program. The plan covers all the 8 key result areas of the NHP, but focuses mainly on KRA 4,5,6 & 7.

The Strategic Plan summarises the priorities for the next 5 years and aims to provide clear direction to the National Technical Advisors and Managers at the national level to guide their staff within their units and to guide the implementers at the sub-national levels for effective implementation of the National Health Plan.

Figure 5: Key Result Areas and Objectives of the National Health Plan 2011-2020

Key Result Area (KRA)	Objectives
KRA1 – Improve service Delivery	1.1 Increased access to quality health services for the rural majority and the urban disadvantaged.
	1.2 Rehabilitated and strengthened primary health care infrastructure and equipment
	1.3 The right health professionals work in the right places, are motivated, and deliver right (quality) services.
	1.4 Hospital infrastructure is rehabilitated.
KRA2 – Strengthen partnerships and Coordination with Stakeholders	2.1 The National Public Private Partnerships Policy is implemented, and innovative and cost-effective options for delivering services introduced
	2.2 Expanded partnerships with resource developers, private health care providers, churches, and NGOs in rural (remote) areas and urban settlements
	2.3 The health sector works collaboratively with all stakeholders to expand the reach of quality health services
	2.4 The health sector coordinates and monitors the implementation of the National Health Policy
KRA3 – Strengthening Health Systems and Governance	3.1 Improve financial resource management for health service delivery
	3.2 Quality workforce provided, capable of meeting the health needs into the future
	3.3 Medical supply procurement and distribution services are efficient and accountable.
	3.4 The health sector proactively identifies and uses innovative and evolving ICT solutions and delivers accurate and timely information for planning and decision making.

	3.5 Improved leadership, governance, and management at all levels of the health system.
	3.6 Strengthen health sector management and system capacity across Papua New Guinea.
KRA4 – Improve Child Survival	4.1 Increase coverage of childhood immunization in all provinces.
	4.2 Reduce case fatality rates for pneumonia in children through acceleration of roll-out of Integrated Management of Childhood Illnesses (IMCI) to all provinces.
	4.3 Decrease neonatal deaths.
	4.4 Reduce malnutrition (moderate to high) in children under the age of five years.
KRA5 – Improve Maternal Health	5.1 Increase family planning coverage.
	5.2 Increase the capacity of the health sector to provide safe and supervised deliveries
	5.3 Improve access to emergency obstetric care (EOC)
	5.4 Improve sexual and reproductive health for adolescents.
KRA6 – Reduce the Burden of Communicable Disease	6.1 Reduce malaria-related morbidity and mortality in Papua New Guinea
	6.2 Control tuberculosis (TB) incidence by 2020, with a decline in cases of multi -drug resistant tuberculosis (MDR-TB)
	6.3 Scale up prevention, treatment, care, and support for sexually transmitted infections (STIs) and HIV to meet universal access targets.
	6.4 Strengthen communicable disease surveillance and monitoring
KRA7 – Promote Healthy Lifestyles	7.1 Increase health sector response to prevention of injuries, trauma, and violence with an impact on families and the community.
	7.2 Reduce the number of outbreaks of food and water-borne diseases.
	7.3 Increase individuals' and communities' involvement in their own health.
	7.4 Reduce morbidity and mortality from non-communicable diseases.
KRA8 – Improve preparedness for Disease Outbreaks and Emerging Population Health Issues	8.1 Increase capacity of the health sector to identify, monitor, and report on urgent and emerging health threats.
	8.2 Increase capacity of the Central Public Health Laboratory (CHPL) to provide services to meet urgent and emerging concerns.
	8.3 Improve capacity and preparedness of the health sector to address the impacts of climate change.

	8.4 Ensure the health sector works collaboratively to manage population health threats related to the growing resources boom.

It is expected that when the National Health Plan is fully implemented, it will contribute to the improved financing for immunization activities, reduce mortality rates in the country and move more quickly toward achieving its Sustainable Development Goals.

(3) Leadership and management

The leadership in implementation of the National Health Plan 2011-2020 is provided by the National Department of Health. At the provincial level the NHP implementation is led by the Provincial Administrations. In the provinces implementing the Province Health Authority Reform, the leadership is provided by the Provincial Chief Executive Officer (CEO). Responsibilities of Provincial Health Administrations and Provincial Health Authorities include: delivery of health programs in rural areas and training of the service provider staff such as immunisation patrols and village birth attendant trainings; overall management of the rural public health facilities; equipment maintenance at the rural public health facilities; distribution of pharmaceuticals, vaccines and medical/injection supplies to the rural health facilities and maintenance of the infrastructure of the rural health facilities. Provinces are also responsible for supporting provincial HIV committees; establishing voluntary counselling and testing sites; ensuring compliance with national standards. Service delivery is the ultimate responsibility of the Districts.

The management of the Expanded Program of Immunization (EPI) at the national level is provided by the Family Health Services Branch of the Public Health Division of the National Department of Health. At the provincial level, the responsibility of EPI management is assigned to Deputy Provincial Administrator in Social Services who is also responsible for overseeing implementation of the National Health Plan. In the provinces implementing the Province Health Authority reform this function is responsibility of the Director of Public health, who reports to the Provincial Chief Executive Officer (CEO). At the district level, the District Family Health Coordinator is in charge of the overall management of EPI implementation.

Management responsibility for hospitals and rural health services within provinces is divided within public sector. The National Department of Health manages the provincial hospitals, while provincial and local governments are responsible for management of all other public health service provision (health centres and sub-centres, rural hospitals and aid posts), known collectively as 'rural health services').

1.2.3 Service delivery

Service delivery in PNG is mainly provided at government and church health facilities and is, funded by a mix of government tax revenues, out-of-pocket payments and donor funds. The central government is responsible for the national referral hospital, one specialist hospital, 4 regional and 16 provincial public hospitals. The greater part of public and primary health care services is delivered by provincial and local health facilities: rural hospitals, health centres, health sub-centers, and aid posts.

In the National Health Plan and Service Standards, health care in PNG is envisioned as a hierarchical structure of 7 levels with level 1 as the least complex basic health services are provided through aid posts and community health posts, and level 7 as the most complex set of health services is provided at the national referral hospital.

Government-subsidized church health services are an integral part of the national health system. The church facilities provide almost 50% of ambulatory services, particularly in the most hard-to-reach areas of the country. The management of service delivery, including planning of operations and staff management is provided by the non-for-profit Council organized under the church. The government covers over 80% of service costs without any formal contractual arrangement with church. In principle church should be the part of the local planning and decision-making process under the coordination of provincial and district authorities but in practice, participation of the church is limited. Church organizations also run 6 of the 9 nursing schools and all 14 of the community health worker training schools, but again there is no either formal contractual arrangement with the government or clear links with overall national health workforce planning or requirements.

Private sector organizations include for-profit enterprise-based services or employment-related health care programs, small for-profit private sector, women's and youth organizations, NGOs and an undocumented number of unregulated traditional healers.

(1) Provincial Hospitals

There is one provincial hospital in each province including Port Moresby General Hospital in the National Capital District which also operates as the national referral hospital. In addition, there is one specialized psychiatric hospital run by the government. Currently all hospitals are funded by the government. The medical specialists and specialist nurses provide core clinical and subspecialty clinical services on site.

(2) Urban Clinics

Services provided by urban clinics include management of chronic and acute conditions, basic surgical care, deliveries and paediatric care.

(3) District and Rural Hospitals

The District and Rural hospitals provide full basic in- and out-patient health services including medical, surgical, obstetric, paediatric, trauma and 24-hour emergency care.

District hospitals cover a population of 40,000 to 300,000 depending on availability and accessibility of other health facilities nearby.

(4) Health Centres

Rural health centres and sub-centers provide management of chronic and acute conditions, basic surgical care, deliveries and paediatric care. Rural health centres also function as intermediary referral points between district lower level facilities and district hospitals. The Health centres serve a population of 5,000 to 20,000. The government more commonly runs the larger health centres.

(5) Health Sub-Centres

The Health Sub-Centers are rural facilities delivering same services as health centers. The church groups more commonly run the smaller sub-centers.

(6) Aid Posts and Community Health Posts

Rural aid posts comprise more than 70 percent of all health facilities and deliver basic health care including mother and child care, immunization services and community-based health promotion

services. Staff of these facilities is comprised by community health workers who were trained through a two-year training course. Aid posts are designed to cover a population group of about 1,000 people each.

The staff of recently introduced *Community Health Posts* is comprised by one Community Health Worker (CHW), one Midwife, One Nursing officer and in some facilities one Health Extension Officer. These facilities serve approximately 10,000 people. One of the main purpose for designing and establishment of community health posts was to improve the maternal and child health at the rural areas. As it is envisaged by NDoH in the long run, the community health posts will replace and phase out the Aid Post Facilities.

Figure 6: PNG health facilities, 2010

Health Facility	Government (%)	Mission	Other	Total
Provincial Hospitals	20	2	-	**22**
Urban Clinics	48	10	11	**69**
District&Rural Hospitals	5	7	2	**14**
Health Centres	149	48	4	**201**
Health Sub-Centers	158	263	7	**428**
Air Posts	2,672			**2,672**

Source: Health Service Delivery Profile PNG 2012 and "the health workforce enhancement plan 2013-2016"

1.2.4 Healthcare workforce

The number of health professionals is very low in PNG: 5.3 nurses/midwives and less than 1 doctor per 10,000 people. Community health workers comprise almost 35% and nursing officers about 30% of the total health workforce. Medical officers and health extension officers (intermediate level workers bridging the gap between doctors and nurses) together comprise less than 8%.

There is a lack of sufficient health workforce across all health facilities of the country. Many aid posts have closed partly due low motivation of staff to work in remote, financially unstable and frequently dangerous environments. Many rural hospitals cannot retain medical officers and thus more than 80% of the medical officers work in urban areas. In many cases, medical officers are responsible for hospital administration and management. Medical staff shortage in health facilities combined with an aging health personnel suggest that short- and long-term human resource supply gaps are expected.

Summary information on the number of health workers in 2013 in PNG is shown in Figure 7 below.

Figure 7: Total Public Financed Service Delivery Staff by Gender and Occupation

Category/Function	Male	Female	Total	% Male	% Female
Hospital/Urban					
Medical Officers	246	82	**328**	75.0	5.0
Health Extension Officers	67	59	**126**	53.2	46.8
Nursing Officers	265	1,515	**1,780**	14.9	85.1
Midwives	12	80	**92**	13.0	87.0

Community Health Workers	363	1,029	**1,392**	26.1	73.9
Dentists/D. Therapist	49	29	**78**	62.8	37.2
Total	**1,002**	**2,794**	**3,796**	**26.4**	**37.2**
Category/Function	**Male**	**Female**	**Total**	**% Male**	**% Female**
Rural Health					
Medical Officers	40	11	51	78.4	21.6
Health Extension Officers	185	100	285	64.9	35.1
Nursing Officers	468	1,004	1,472	31.8	68.2
Midwives	64	138	202	28.1	71.9
Community Health Workers	1,620	1,386	3,006	53.9	46.1
Dentist/D. therapists	31	11	42	73.8	26.2
Total	**2,408**	**2,650**	**5,058**	**47.5**	**52.2**

Source: Health Workforce "Enhancement Plan" – PNG DoH, 2013

A recent World Bank review[9] has highlighted the critical nature of the staffing problems in PNG health facilities and underlines the need for substantial increase of the number trained doctors and nurses, predominantly in the rural settings. Considering the population growth, the review recommended a large-scale and immediate increase of training opportunities for health professionals with simultaneous expansion of positions within the public sector. The WB suggests that by 2030 doctor numbers should increase on average by 8.1% per annum, nurses on average by more than 7% per annum and Community Health Workers (CHWs) by 5.2% per annum. Health personnel capacity building will require significant strengthening of the training capacity of the educational institutions to accommodate existing trainings needs of doctors, nurses and community health workers.

Recognizing the urgency needs of the health sector, the National Department of Health has started seeking opportunities to expand the health workforce in line with the WB review findings and submitted "a whole-of-government approach" for expanding the health workforce. In 2013 Department of Health developed The Health Workforce Enhancement Plan" which is consistent with all key policy documents of the country.[10] The Health Workforce Enhancement Plan" calls for major increases in the training enrollment to ensure filling HR gaps across the health care system of the country.

1.2.5 Healthcare financing

Currently the health sector in PNG is funded from two main sources: The government of PNG and the Australian Agency for International Development. The remaining international donors provide relatively small amounts of aid, generally in niche areas.

The Government of PNG is funding health sector through the recurrent budget, administered by the Department of Treasury (DoT) and the development budget - administered by the Department of National Planning and Monitoring (DNPM). Within the recurrent budget, the health sector is supported through Health Function Grants to provincial governments,[11] primarily for operational

[9] Health Workforce Crisis "A Call to Action" – WB, October 2011

[10] NHP 2011-2020, MTDP for Health (2011-2015), PNG Vision 2050, PNG DSP (2010-2030) and the MTEF 2011-2015.

[11] All provinces, except ARB and NCD. Instead of an annual health function grant, ABG receives an annual unconditional recurrent goods and services grant to cover all its functions including health.

spending on the three Minimum Priority Areas (MPA) for health, staff salaries and related costs for the delivery of services and separate appropriations to NDoH, NACS, the Institute of Medical Research and Hospital Management Services (which includes funding for church facilities).

Health function grants are included in the national budget to provinces and area based on a cost of services estimate developed by the National Economic and Fiscal Commission (NEFC). The provinces hold responsibility for using these grants to deliver the health services to the population. In addition, provincial governments also allocate funds towards health through their own internal revenue sources. [12] The revenues of the provinces comprise national grants earmarked for provinces, GST distribution, bookmakers' tax, own source revenues, royalties and dividends.

The 2014 budget was a partially "integrated" budget, consisting of recurrent and development allocations.

Government of PNG financing of health within the development budget includes Public Investment Programs (PIPs), loan-financed projects (for instance, the ADB-assisted rural primary health service delivery project) and health projects under the tax credit scheme. Additional funding for health in the development budget includes; (i) Special Support Grants (SSG) and other funding related to mining and petroleum projects; (ii) the nondiscretionary component of the District Support Grants that are paid through provincial governments; (iii) the Social Development Program providing support to civil society and churches; (iv) the District Service Improvement Program (DSIP); (v) Provincial Service Improvement Program (PSIP); and (vi) the restoration grand for ARB.

Currently the PNG is implementing two important reforms (DFF and FBBs) "Direct Facility Funding (DFF) and Facility-Based Budgeting in selected areas of the country:

It is critical that funds reach the point of service delivery – health facilities. Evidence from both the case study of district service delivery and the rural health services costing model (DPLGA, 2009) revealed that lack of operating funds and medical supplies at the facility level have been the major obstacles in high quality service delivery.

Under the DFF model, money is transferred from a central or provincial account, through the supervising health facility into specific health facility cheque accounts to meet health center and aid post operational expenses. Provinces and districts provide oversight and management and are authorized to direct facility allocations. NEFC unit cost estimates have been used to determine overall facility cost requirements including an allocated amount for each facility (aid posts). Each facility is required to prepare a funding request covering agreed costs within a preemie allocation in order to qualify for funding. This is endorsed by the facility's Health Committee and approved by the Chief Executive Officer, Division of Health.

A recent evaluation of the DFF has shown that the nine health centers spent around 40 % of total expenditure on referral, mobile clinics, and outreach activities; and around 60% on casual staff, maintenance, office supplies and utilities.[13] Health centers were able to spend, on average, 94 percent of the total funds they received in 2012. The per capita budget allocation varied from PGK6.88 to PGK 20.07[14] between health centers.

[12] Refers to the government budget books
[13] NDOH 2013b

[14] PKG exchange rate in 2012: 1USD = 2.63 PGK

Facility-based budgeting (FBB), a pre-cursor to DFF may prove to be a less onerous alternative to DFF. FBB provides the benefits of DFF by encouraging explicit resource allocation at the facility level through Chart of Accounts coding, but avoids some of the weakness of DFF implementation. The success of DFF depends crucially on ex-post controls, such as the establishment of inspectors and/or internal audit mechanisms.[15] In reality, in many areas of PNG it is hard to find financial staff. Considering that DFF requires a strong and qualified staff for financial management and given the capacity constraints at the provincial and facility levels FBB may prove to be more feasible.

In 2014 total health expenditure per capita in Papua New Guinea was estimated at 92.36 US$, or about 3.47 percent of GDP. During the period 2000 – 2007, PNG spent between 30 US$ and 39 US$ and since 2008 has spent about 50 US$ per capita, however, whilst there are noted improvements in the level of inputs in the health sector, there are no observed improvements in outputs or outcomes.

Figure 8: Health Expenditure Pattern in PNG

	2009	2010	2011	2012	2013	2014
Health expenditure per capita (current US$)	$52.76	$59.25	$90.89	$97.88	$100.77	$92.36
Health expenditure, public (% of total health expenditure)	73.91	76.24	81.76	80.29	81.74	81.28
Health expenditure, public (% of government expenditure)	10.76	10.39	13.16	11.66	11.18	9.54
Health expenditure, public (% of GDP)	3.22	3.18	4.04	3.65	3.91	3.47
Health expenditure, total (% of GDP)	4.36	4.18	4.94	4.55	4.78	4.26

Source: WHO GHED (NHA)

Figure 9: Costing of the National Health Plan 2011-2020 – recurrent costs of the NHP

	2010	2011	2012	2013	2014
Recurrent Costs					
Personnel Expenditure Summary (K'000)	371,312	379,277	387,564	396,188	405,650
Medical Supplies	148,710	163,861	165,255	175,783	184,079
Operating costs	382,404	375,985	383,402	406,345	428,193
Capital Costs					**2011-2020**
Rural Health Services					454,025
Rural Water Supply					215,330
General Hospitals					2,624,943
Pre-service training					0
Central (ICT Development)					75,316
Total Capital Costs					**3,373,613**

Figure 10: Costing of the National Health Plan 2011-2020 – capital costs of the NHP

In the medium to long term, there exists some scope for economic growth to mobilize additional general revenues for health, particularly with the commencement of Liquefied Natural Gas production in 2015 and a number of additional extractive projects that are under active consideration. Based on past trends, the Government of Papua New Guinea's health spending as a share of GDP is likely to remain flat (see Figure 8 above). Government revenue as a share of GDP is, however, projected to fall over the medium term. Should Government revenue base not improve, budgetary

[15] Hiddink, 2012

financing gaps are expected to emerge through to 2017. As such, in the short to medium term, significant increases in fiscal space for health are unlikely.

Given the limited fiscal space, health sector has to compete with other national priorities such as security, education, infrastructure, and other national investments in order to increase its share for resource allocation.[16]

1.3 Immunization system

The Expanded Program on Immunization (EPI) in PNG began in 1977 with vaccines against six diseases—Diphtheria, Pertussis, Tetanus, Measles, Polio and Tuberculosis. The program was expanded later with the introduction of Hepatitis B vaccine in 1989. In 2009 EPI introduced Pentavalent vaccine and in 2014 - PCV vaccine. Two new vaccines were introduced in the routine immunization program – MR and IPV vaccines in 2015.

Since its establishment, the EPI has been a priority program of the National Department of Health (NDoH) and the PNG Government. The Government showed strong commitment to reach every child and mother with quality immunization services over the course of 2011-2015 period to reduce mortality and morbidity arising from vaccine preventable diseases. The National Health Plan 2011-2020, elaborated by the National Department of Health identified improvement of child survival through vaccination of children and women as one of its key priority areas, and vaccination is considered as cost-effective public health measure for saving lives of children and women from vaccine preventable diseases, with considerable cost savings for the government and thus, contributing to the national economy in long-run.

Currently EPI is one of the six (6) key programs[17] within the Family Health Services Branch of the Public Health Division of the National Department of Health.

NDOH sets the following objectives for EPI: to reach coverage of immunization of more than 90% of target population at the national level and at least 90% of target population at the district level; maintain poliomyelitis free status of the country; eliminate measles; control hepatitis B; eliminate maternal and neonatal tetanus; ensure injection safety and introduce new vaccines and innovative technologies.

1.4 The past program priorities and objectives

Goal of the Immunization Plan of PNG was to decrease VPD associated morbidity and mortality. For achieving this goal, the Government of PNG in collaboration with implementing partners identified eleven (11) priority areas for EPI implementation during the period 2011-2015:

1. Increase routine immunization coverage for all antigens to reach every child and mother, especially in hear-to-reach areas
2. To improve and upgrade the cold-chain at all levels
3. To make progress towards elimination of measles

[16] "Assessment of health financing options – Papua New Guinea" – the World Bank, 2014

[17] Along with the EPI the Family Health Services Branch implements Sexual and Reproductive Health (Maternal Health) Program; Child Health Program; Nutrition Program; Youth and Adolescent Health Program and Gender and Men's Health Program.

4. To make progress towards hepatitis B control
5. Maternal and neonatal tetanus elimination
6. Maintain PNG's polio free status
7. To introduce new vaccine(s) (HPV) into the country's immunization schedule.
8. Improve existing surveillance and data management systems
9. Ensure participation and mobilization of communities for supporting the RI activities and strengthen provincial level leadership capacity
10. Improve budgeting and budget execution at National and Provincial level

1.4.1 Routine immunization

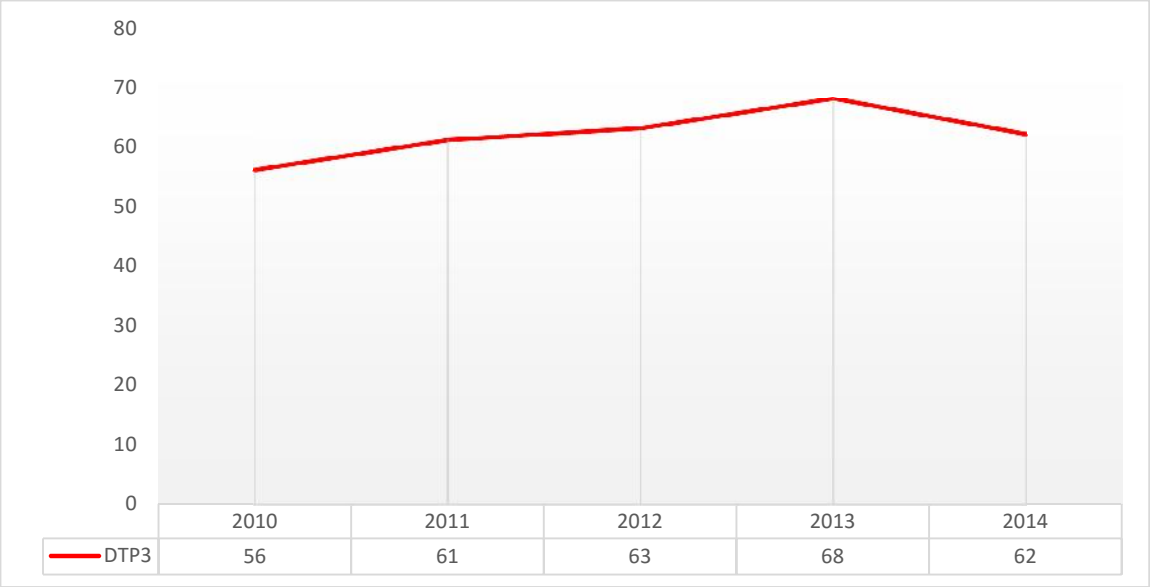
Immunization is a high yield activity where a small investment is paid back in saving of lives, money, and hospitalizations many times over. According to the Mid-Term Review and Joint Assessment of the PNG National Health Plan[18] although the importance of immunization being especially emphasized in the NHP, this public health program has failed and the country was wracked by a measles outbreak in 2014, resulting in at least 5,000 cases involving in some cases deaths, blindness, brain damage and pneumonia.

One of the main objectives of the cMYP 2011-2015 was to achieve high quality immunization services to reach every child and mother, however in 2014 the coverage estimates for all antigens of the national immunization schedule indicated decrease in comparison with the previous year.

The DPT3 coverage decreased from 68% in 2013 to 62% in 2014. Targets for DPT3/Penta3 coverage for 2013 and 2014 were 80% and 85%[19] respectively.

[18] The Mid-Term Review and Joint Assessment was conducted in 2015
[19] cMYP 2011-2015

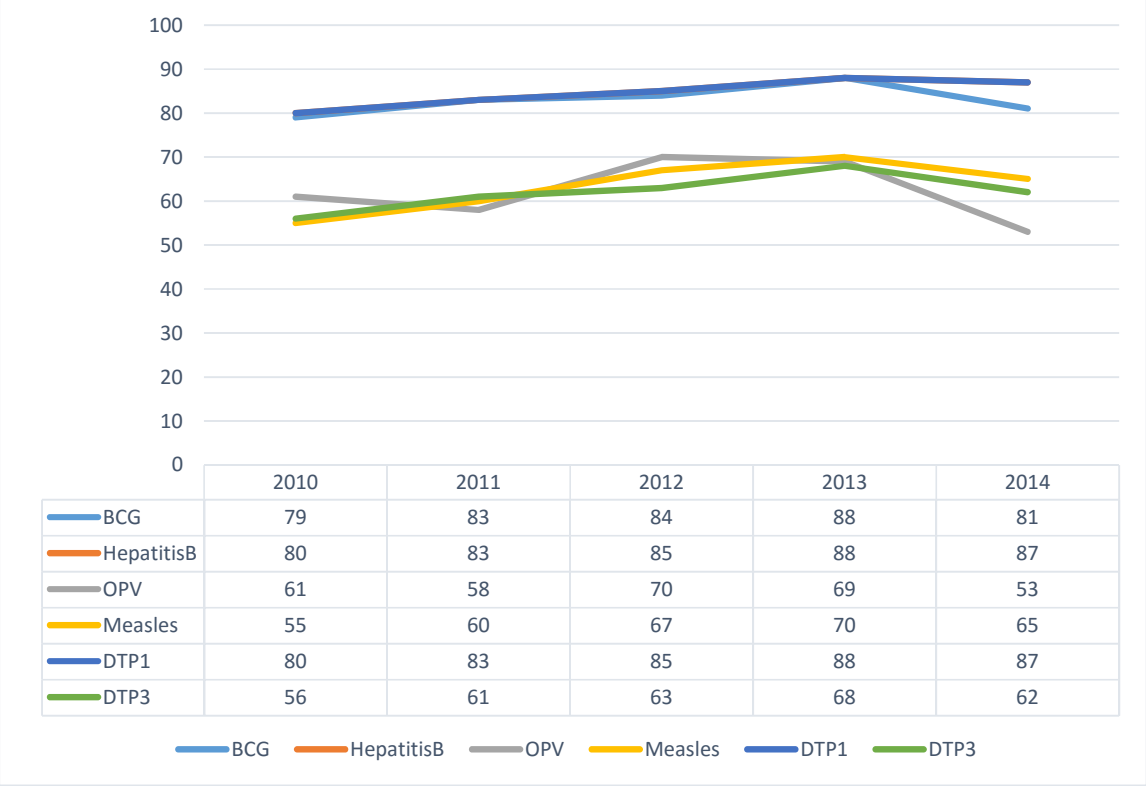
Figure 11: Trend of DPT3 containing antigen Coverage in PNG



Source: WHO UNICEF Estimates

As it shown in the Figure 12 below, similarly to DPT3, the coverage trends for all routine immunization antigens showed substantial decrease in 2014 when compared to the previous year.

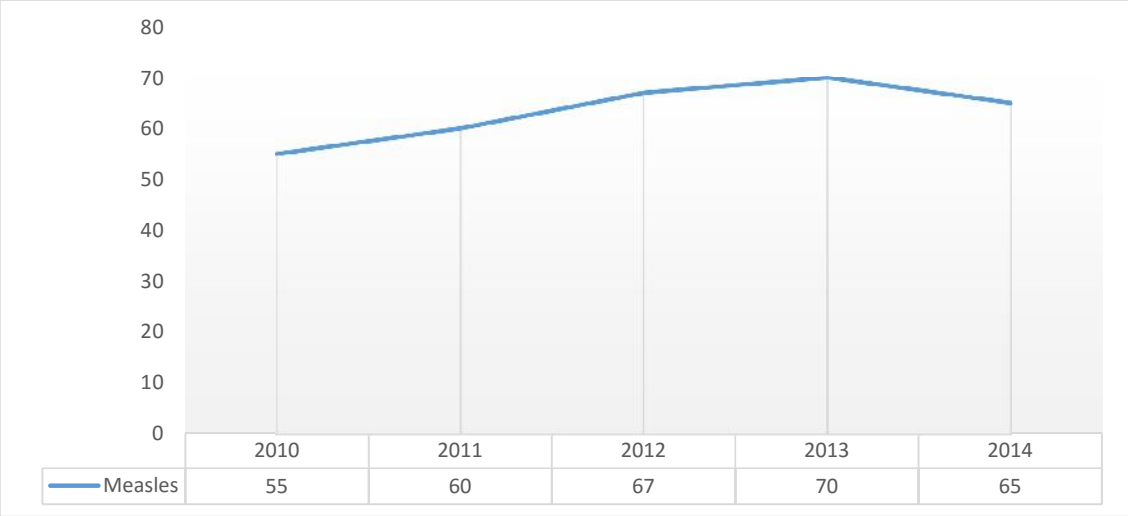
Figure 12: RI coverage (%) trends by by antigen (2010-2014)



Source: WHO UNICEF official estimates

PNG joined Member States of the Western Pacific Region to achieve a regional goal for measles elimination requiring at least 95% coverage with 2 doses of measles vaccine. Despite all efforts of EPI PNG, measles vaccine coverage rates showed decline of coverage from 70% in 2013 to 65% in 2014 which is far below of the target coverage rate (see Figure 13 below).

Figure 13: Trend of measles containing antigen Coverage in PNG



Source: WHO UNICEF Estimates

The EPI performance has been variable across the provinces and districts. Based on the analysis of DTP3 coverage rates in all provinces and districts of the country 11 (50%) provinces of the were ranked as the high risk provinces for potential outbreaks (see Figure 14):

Figure 14: Performance of EPI across the provinces

Province	Children under 1	CBAW	DTP1	DTP3	TT2+	ANC/> 1visit	HF delivery rate	% CBAW vaccinated			
Province	#	#	%	%	%	%	%	Round 1	Round 2	Round 3	Risk Status
	2014	2014	2014	2014	2014	2013	2014				
Western Province	6,551	48,832	105%	49%	59%	63	40	78%	61%	29%	High
Gulf Province	5,320	39,301	55%	33%	30%	78	36	70%	56%	mop-up	High
Southern Highlands	16,954	153,894	63%	42%	33%	50	25	61%	38%	25%	High
Enga Province	14,485	130,527	57%	41%	38%	53	28	93%	37%	0%	High
Morobe	21,629	167,670	62%	35%	28%	66	9	82%	36%	22%	High
East Sepik	14,659	110,721	72%	38%	33%	47	29	80%	Mop Up	0%	High
West Sepik	8,107	59,621	57%	32%	30%	27	29	83%	0%	0%	High
New Ireland	6,705	47,089	71%	55%	41%		47	85%	2%	0%	High
Hela	8,165	73,845	38%	19%	20%				18%		High
Jiwaka	12,283	113,529	61%	48%	29%			0%	2%	0%	High
Madang	16,167	120,505	63%	28%	28%	53	31	59%	0%	0%	High
National Capital District	12,135	104,123	147%	122%	63%	83	125	122%	52%	66%	Low
Milne Bay	8,997	65,571	136%	128%	76%	75	68	81%	15%	11%	Low
Western Highlands	12,056	109,039	108%	92%	70%	63	37	79%	59%	105%	Low
Chimbu	12,584	109,645	66%	52%	111%	57	39	39%	20%	82%	Low
Eastern Highlands	18,922	156,715	117%	72%	52%	61	41	66%	82%	0%	Low
East New Britain Province	11,042	82,309	84%	59%	69%	80	70	92%	17%	0%	Low
West New Britain	8,807	66,231	133%	108%	106%	99	73	85%	9%	0%	Low
AROB province	8,285	62,857	112%	77%	93%	111	65	102%	72%	0%	Low
Central Province	9,044	64,718	76%	61%	34%	59	31	69%	45%	0%	Low
Northern Province	6,172	44,983	101%	71%	38%			72%	35%	0%	Low
Manus	1,998	14,163	69%	65%	27%	50	46	96%	23%	0%	Low

PNG	**241,067**	**241,067**	**83%**	**62%**	**50%**	**62**	**44**				

District level analysis of EPI performance showed that achievements of EPI across the districts (within the provinces) were also diverse and significantly differed from one district to another even within a given province. According to the results of analysis DTP3 coverage rate was below 50% in 44 out of 89 districts (51%), leaving approximately 48.5% (or 121,508) children unprotected against the vaccine preventable diseases.

Figure 15 presents the details of EPI achievements in the high risk districts:

Figure 15: EPI performance Across the Districts – Low Performing Districts in PNG

Province/District	%DTP3 Coverage	Dropout - DTP1_DTP3	Population<1	Dropout- Penta1_MCV1
Western Province				
Middle Fly	15	68%	2647	42%
South Fly	41	36%	1973	53%
Gulf Province				
Kerema	18	44%	3738	55%
Kikori	25	38%	1777	31%
Central Province				
Goilala District	13	57%	1253	47%
Kairuku - Hiri District	47	23%	4221	5%
Rigo District	40	12%	1962	-21%
Southern Islands				
Kagua/Erave District	43	27%	2543	29%
Mendi/Munihu District	30	50%	4961	78%
Nipa/Kutubu District	37	38%	5043	8%
Hela				
Komo/Magarima District	40	33%	3233	22%
Koroba/Kopiago District	42	14%	2483	-94%
Tari/Pori District	36	33%	2671	-50%
Kandep District	34	-152%	2538	22%
Western Highlands				
Anglimp/South Waghi	30	40%	7330	-15%
Jiwaka				
North Waghi District	28	42%	2964	3%
Chimbu				
Gumine District	35	30%	1966	39%
Karimui/Nomane District	26	15%	1804	-177%
Sina Sina Yonggomugl District	32	-14%	1964	-54%
Eastern Highlands				
Daulo District	44	26%	1533	8%
Kainanatu District	35	49%	4228	30%
Lufa District	46	37%	2045	9%
Okapa District	25	21%	2458	-6%
Unggai/Benna District	46	-15%	2248	-46%
Morobe				
Huon District	36	51%	2536	60%
Kabwum District	37	30%	1421	30%
Menyamya District	11	58%	2851	52%
Tawae/Siassi District	40	48%	1777	52%
Madang				
Bogia District	39	62%	2524	39%
Middle Ramu District	7	60%	2653	21%
Rai Coast District	16	66%	2798	25%
Sumkar District	39	49%	2856	41%
East Sepik				
Usino Bundi District	35	58%	2045	51%
Ambunti/Drekikier	18	69%	2385	66%
Angoram District	33	65%	3273	70%
Maprik District	28	43%	2410	68%
Wewak District	48	36%	2927	51%

Province/District	%DTP3 Coverage	Dropout - DTP1_DTP3	Population<1	Dropout- Penta1_MCV1
Yangoru Saussia District	44	34%	1964	40%
West Sepik				
Vanimo/Green River	40	61%	2313	59%
New Ireland				
Namatanai District	39	14%	4008	33%
East New Britain				
Kokopo District	48	21%	3061	82%
Pomio District	48	23%	2504	60%
Rabaul District	31	21%	3061	31%
West New Britain				
Kandrian/Gloucester	22	58%	2558	55%

Source: NHMIS, 2015

Reaching the rural communities through outreach sessions, considered as the key to success of the PNG EPI program, has been increasingly irregular in every health facility area across the country. According to the Sector Performance Annual Review 2014, the PNG EPI has not achieved the national target for rural outreach sessions (clinics), set at 100 sessions per 1,000 children under 5 years of age. The number of sessions carried out by EPI during the 2009-2013 period amounted to 35.

In 2014 and 2015 only 18% of PNG districts reported over 80% coverage rate. The dropout rate for DPT1-DPT3 (Penta1-Penta3) was estimated at 21% showing a slight improvement in comparison with 30% estimated in 2013.

One of the key findings of the Mid-Term Review and Joint Assessment of the PNG NHP 2011-2020 was related to the impact of the implementation of SIAs on the overall performance of the National Immunization Program. Particularly the evaluation found that although donor funded and designed SIAs have contributed in increased coverage over the last decade, they created perverse incentives for maintaining coverage between SIA rounds.

The analysis of immunization coverage data showed high coverage figures in the SIA years and extremely low coverage reached in the intervening years. All these suggested that although SIA activities has contributed in building the coverage, they were demotivating health care workers to focus on and improve routine immunization service delivery. The evaluation found an evidence that supplementary vaccination activities in PNG are quite disruptive to the health system, as although they may increase vaccine coverage in short-term, eventually they lead to overall decrease immunization coverage. During the SIA years the program has sufficient resources and logistical support to get the job done, while in non-SIA years EPI is not a priority program. All these triggers motivation of the health workers to wait for the next SIA, when they can enjoy the outside support, comradery of activities and travel and patrol allowances, rather than to make an effort to improve routine vaccinations either facility based or through outreach and mobile sessions. As an illustration to the above assumption, the mid-term review reported a case, when a church hospital was advised to stop immunization by the provincial health advisor, to receive all the SIA funds. In result immunization levels in that area was collapsed.

Special integrated Routine EPI Strengthening Program (SIREP and SIREP Plus Programs)

In response to the findings and recommendations of the Mid-Term Review the National Department of Health through its EPI program designed a National Plan and Strategy for Special Integrated Routine EPI Programs in PNG – SIREP and SIREP Plus. These strategies were designed to enable provincial and district health managers to improve EPI performance under the guidance of NDoH and contribute in achievement of Key Results 4 and 5 of the National Health Plan.

These two strategies were designed based on the results of the EPI surveillance consultative workshop organized by the National Department of Health in 2014 with participation of provincial health staff.

The ultimate goal of the SIREP and SIREP Plus strategies is to support the National Immunization Program in acceleration of Routine Immunization component of the EPI and increase coverage of the target population with routine immunization antigens included into the national immunization schedule. These two strategies will be focusing on improvement of the most critical components of the EPI, such as service delivery, demand generation, communication, EPI staff capacity development and advocacy for ensuring sufficient funding of the immunization program.

More specifically, the SIREP program aims at supporting EPI to:

- achieve target coverage rates and ensure equity in immunization service delivery at the district level
- ensure effective communication, coordination and collaboration among the communities and key stakeholders in implementation of SIREP/EPI
- Improve effectiveness of vaccine management system (including logistics systems)
- Improve data collection and surveillance systems
- Advocate for mobilization of the adequate resources to reach target coverage objectives
- SIREP Plus was designed as an additional and complementary component of the SIREP strategy which aims at:
- Introduction of the new vaccines;
- Support EPI in identification and reaching new target populations – unvaccinated children in all districts; and
- Accelerate RI immunization among the high-risk population groups.

SIREP and SIREP Plus strategies are identical to the EPI strategies and are undergoing regular and periodic review based on the current existing context in the country.

1.4.2 Routine immunization data management and reporting

(1) Reporting

The Routine Immunization Programme in Papua New Guinea is supported by an established surveillance system for i) Measles/Rubella, ii) Poliomyelitis, iii) Meningitis-Encephalitis and iv) Rotavirus. In addition, the country established neonatal tetanus (NT) reporting system, as a built-in part of the National Health Management Information System (NHMIS).

Recently the NDoH, with financial support provided by the Asian Development Bank (ADB) has started development of the new, web-based HMIS, since the sensitivity, capacity and quality of the existing HMIS has been questionable and called to immediate improvement. A lack of reliable methods to define the actual population numbers, coverage rates and the critical problems related to almost all components of the immunization system, led to the inability of EPI to make informed decisions and elaborate strategies for reaching sufficient coverage targets. The staff of the majority of health

facilities, have no clear ideas about the catchment areas and target population of their respective health facilities,[20] and therefore both Provincial Authorities and Health Facilities have to use an estimated population figure based on the population census data, with no detailed understanding of the target population per communities and settlements in their respective catchment area. There's no system or any formalized attempt to track defaulters, resulting in high number of missed opportunities for vaccination.

Along with the poor performance of majority of health facilities in terms of health information management, the EPI review 2013 found a number of facilities across the several provinces with an excellent practice of recording through regular use of the child health registry cards and coverage monitoring charts, suggesting that the experience of these facilities could be analyzed and effectively replicated in all facilities of the country.

(2) Data quality

There is no data quality management and analysis systems institutionalized in EPI PNG. The operational channels for sharing data between the administrative levels are sub-standard leading to the insufficient sharing of quality data across the levels of the health care/EPI system.

1.4.3 Accelerated disease control initiatives

Achievements of EPI in accelerated disease control against the set targets are represented in Figure 16 below:

Figure 16: Summary of the analysis of the accellerated disease control iniatives

EPI Strategic Objectives	Indicators	cMYP Target	Achieved results by 2015
Measles	- MCV1 (MCV at 9 month) national coverage	>90%	60%
	- % Districts with MCV2 coverage >90%:	>95%	4.6%
	- MCV SIAs national coverage	>95%	no data
	- % Districts with MCV SIAs coverage >95%	>80%	no data
	- National Non- Measles suspected case reporting rate	≥ 2 / 100,000	2
	- % Provinces reporting at least one suspected measles case / 100,000 population per year	>80%	10.3%
	- % Measles cases with adequate investigation* within 48 hours of report:	>80%	54%
	- % Adequate serum samples (from suspected measles cases) with laboratory results within 7 days of receipt:	≥ 80%	54%
Hepatitis B	- Timely HepB-birth (<24 hours) national coverage:	>80%	no data
	- HepB-birth ≥24 hours national coverage:	>90%	no data

[20] EPI Review 2013

	- % Districts with Timely HepB-birth (<24 hours) coverage >80%:	>90	no data
	- HepB3 national coverage (DTP-HepB-Hib 3 national coverage):	>90%	32%
	- % Districts with HepB3 coverage >80% (% Districts with DTP-HepB-Hib 3 coverage >80%):	>90%	18.4%
Polio	- OPV 3 national coverage:	>80%	63%
	- % Districts with OPV3 coverage >80%:	>90%	21%
	- Non-polio AFP rate (/100 000 children under 15 years of age):	>1	0.9
	- % AFP cases with adequate stool samples within 14 days of onset:	>80%	66.7%
	- % AFP cases reported within 14 days of onset:	> 80%	85%
	- OPV in SIAs national coverage:	80%	no data
	- % Districts with OPV in SIAs coverage >90%:	> 90%	No data
MNTE	- DTP3 national coverage (DTP-HepB-Hib 3 national coverage):	>90%	62%
	- % Districts with TT 2+ coverage >80%:	>90%	6.9%
	- # Districts with NT / 1000 live births $\geq$ 1:	0	no data
	- # High-risk districts conducting SIAs with TT:	23 in 2014 and 40 in 2015	no SIAs conducted in 2014
	- % School-aged children receiving TT through the routine school health programme:	>80 (Denominator school enrolled children)	no data

Source: EPI, HMIS PNG

(1) Polio

In May 2012, the World Health Assembly declared the completion of poliovirus eradication to be a programmatic emergency for global public health. The Polio End Game Strategic Plan 2013-2018 was launched in May 2013. Key to the success of the plan is the continued contribution of all nations in vaccinating every child against polio and ensuring a sensitive Acute Flaccid Paralysis (AFP) surveillance.

PNG was certified as a country free of poliomyelitis by the Regional Commission for Certification of Poliomyelitis Eradication in 2000. PNG is classified as a Tier 2 Country on the Global Risk Tier scale for IPV introduction and prioritization. In recognition of the importance of this issue and for achieving stated objectives, in 2014 EPI PNG developed its own Polio Eradication Endgame Strategic Plan (PNG PEGS). The Plan is aligned with the Global Polio Eradication Endgame Strategic Plan and aiming at delivering a free world of poliomyelitis. Administration of the OPV vaccine in routine immunization has recently led to the spread of the vaccine derived polio virus (VDPV). Although the WPV2 has already been eradicated in the country, 90% of VDPV were found to be derived from the type 2 component of OPV. To ensure sustainability of polio free status of PNG, the PEGS sets transition from OPV (Oral Polio Vaccine) to the IPV (Inactivated Polio Vaccine) as one of the ultimate objectives of the plan. In 2015 PNG introduced a single dose of IPV vaccine. In the same year the country developed the National Polio Switch Plan aiming to switch from tOPV to bOPV.

The Switch Plan was endorsed by the ICC in 2015 and was successfully implemented under the supervision of National Switch Management Committee (formed by the ICC members) in 2016. The Switch was implemented on April 18, 2016 and validated on May 2, 2016.

OPV3 coverage in the country during the period 2010-2013 has been fairly constant and varied between 58% (in 2011) and 70% (in 2012). However, coverage rapidly decreased in 2014 to 53%. Only 20% of districts reported more than 80% coverage rate in 2014, which posed a high risk of any impeding outbreak following importation of poliovirus in the context of the increased industrialization and migration of people from different parts of the world to PNG.

Achievements of EPI in accelerated disease control against the set targets are represented in Figure 16 above.

(2) Maternal Neonatal Tetanus Elimination

TT2+ routine administrative coverage decreased from 60% in 2008 to 50% in 2014. The country faces serious challenges in improving TT coverage even in the situation where the ANC (Antenatal Care) attendance (62%) rate is higher than TT+ coverage rates suggesting a complex of serious problems in the system, one of which could be vaccine availability at the vaccination sites. During the previous cMYP cycle (2011-2015) women of child bearing age (14-44 years) and pregnant women were targeted for demand creation on TT vaccination through campaigns. The TT SIAs targeted all 22 Provinces of the country and was implemented over three campaign rounds. The first round was funded by the external donors and the rest of two rounds - by the Local Administrations. The SIA results showed that only 34% of provinces (8 provinces) managed to complete all three rounds of the campaign due to the funding challenges. The failure of TT SIA contributed in the sub-standard achievements of EPI towards MNT elimination in PNG.

In 2014 no data was reported on number of cases of neonatal tetanus, making impossible for EPI to design effective and evidence based interventions.

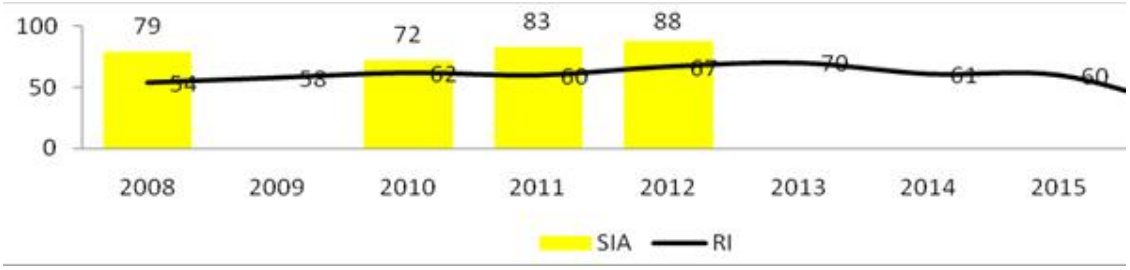
Achievements of the EPI against the targets set for the period 2011-2015 are represented in the Figure 16 above.

(3) Measles

Measles and its complications are one of the main causes of VDP mortality in PNG. In 2014 the administrative coverage for Measles was 65%, showing 5% decrease of coverage compared with the previous year (70% coverage in 2013). In the period 2010-2013 measles coverage has been gradually increasing and varied from 55% in 2010 up to 70% in 2013. PNG planned to eliminate measles by 2012 as it was reflected in the previous cMYP for 2011-2015. The plan towards measles elimination included increasing of immunization coverage through strengthening of routine immunization services, providing second opportunity for immunization through the SIAs and strengthening of measles surveillance with access to an accredited laboratory and ensuring appropriate case management.

Due to the complex of problems faced by all components of the immunization system EPI PNG failed to make any significant progress in elimination of measles. In 2014 the country faced severe measles outbreak caused by the extremely low coverage ranging between the recent years resulting in accumulation of unvaccinated children exposed to the measles all over the country.

Figure 17: Picture Coverage of measles in PNG through Routine and Supplemental Immunization Activities



Source: EPI PNG, HMIS

The low routine immunization and SIA coverage made impossible to establish the sufficient levels of immunization among the PNG communities. The number of unvaccinated children was gradually increasing over the years and the cumulative effect of the unvaccinated groups became the major reason for occurrence of the measles outbreak.

(4) Hepatitis B

The Hepatitis B vaccine was introduced in the National EPI schedule of Papua New Guinea in 1989. The vaccine is administered to all infants at birth followed by three doses administered as part of Pentavalent vaccine. Administration Hepatitis B birth dose requires a close linkage between the presence of skilled birth attendants at delivery and presence of competent person to provide immunization. In PNG approximately 44% of birth are delivered at the health facilities, however there is a significant difference across the provinces in the country. In 2014 the Morobe province reported the lowest health facility delivery rate – 9% and the highest rate was reported in the National Capital District, which could be explained by better access to the health facilities.

Achievements of EPI in accelerated disease control against the set targets are represented in Figure 16 above:

1.4.4 Immunization system performance analysis

The major achievements of the Family Health Services Branch (FHSB) during the last 5-year period (2011-2015) were revision and development of the Implementation Policies. FHSB revised and updated Child Health Policy and Plan; IMCI, Newborn Care, School Health, Sexual & Reproductive Health, Family Planning, Youth and Adolescent Health, Gender, National Nutrition and Infant & Young Child Feeding Policies. The EPI policy was undergoing final revision at the time of development of this cMYP.

(1) Program management

The National EPI Program is one of the six (6) key programs within the Family Health Services Branch of the Public Health Division of the National Department of Health. At the central level, the National EPI Manager reports to the Family Health Service Branch Manager who further reports to the Executive Manager of the Public Health Division supervised by the Deputy Health Secretary of the National Health Services Standard Division and the Health Secretary.

At the provincial level the program is managed by the Provincial Family Health coordinator who reports to the Deputy Provincial Administrator in Social Services.

One of the most critical challenges faced by EPI at all levels is a lack of strong leadership in EPI implementation and clarity around the program management and reporting channels. The roles and responsibilities of provinces, districts and health facilities in program implementation is unclear which leads to inability of the EPI program to effectively implement program strategies and attain desirable targets.

EPI vision and mission

The following EPI vision, Mission and the main goal was formulated by the Family Health Services Branch as part of the Child Health Strategic Implementation Plan 2016-2020:

Vision

That there is positive progress in the health and wellbeing of mothers, children and adolescents as the country progresses towards reaching Vision 2050 goals and aspirations.

Mission

The Strategies outlined here will be used to guide effective implementation of the National Department of Health Priorities of the National Health Plan (2011-2020) in the next 5 years.

Interagency Coordination Committee

The Interagency Coordinating Committee (ICC) is the most powerful body with in the Ministry of Health and responsible for all immunization activities in the country. The ICC is chaired by the Deputy Secretary of the National Department of Health with other members being the Director of the Public Health, Family Health Manger, EPI Manager, WHO representative, UNICEF representative, Medical School representative and Pediatrician from the National Referral Hospital, and representative of the civil society organization in the country. The ICC meets at least on quarterly basis to review the performance of the program and advises on its strategic direction and responsible for managing the national EPI Program of the country.

(2) Immunization service delivery

Immunization services in Papua New Guinea are offered as part of public health services through a network of 745 Maternal and Child Health (MCH) clinics. Approximately 30% of the children are reached through outreach and mobile services. The rest of the target population is covered through immunization sessions organized at health facilities (fixed sites). Approximately 50% of health facilities are government-owned and the remaining by church and private practitioners. Therefore 50% of PNG's immunization services are provided by the public sector providers and another 50% - by church and private service providers.

Figure 18: National Immunization Schedule for Routine Immunization Among Children and Women

Vaccine Name	Target Population	Vaccine Classification	1st Dose	2nd Dose	3rd Dose	4th Dose	5th Dose
BCG	Births	Traditional	Birth				
Hep-B (Birth Dose)	Births	Underused	Birth				
Oral Polio Vaccine	Births	Traditional	1 m	2 m	3m		
IPV	Surviving Infants Surviving Infants	New Vaccine	3m				
Pentavalent (DPT-HepB-Hib)	Surviving Infants	Underused	1 m	2 m	3m		

Vaccine Name	Target Population	Vaccine Classification	1st Dose	2nd Dose	3rd Dose	4th Dose	5th Dose
Pneumococcal Conjugate Vaccine (PCV)	Surviving Infants	New Vaccine	1 mw	2 m	3 m		
MR	Surviving Infants	Traditional	6-8 m	9-11 m	18-24m		
Tetanus Toxoid (TT)	Child Bearing Age Women	Traditional	First contact	+1 month	+6 months		
Tetanus Toxoid (TT)	School Girls	Traditional	School Entry	School exit			
Vitamin A	Surviving Infants	Underused	6 months	12 months	18 months		
HPV	9-13 age girls	New	7-14 y	+6m			

Currently, immunization services are being provided through the fixed, mobile and outreach sites.

Fixed site services

Fixed sites services are the Routine Immunization services performed on work days providing all routine immunization antigens included into the national immunization schedule. The immunization services at the fixed sites for the population within the HF catchment area are provided by the Health Workers. The frequency of the service delivery (i.e. the number of days where the vaccination sessions are performed) is also unclear due to the absence of the reliable data from the health facilities on the immunization service delivery.

Outreach services

Outreach services are immunization services performed by the staff of health facilities to provide all routine immunization antigens included into the national immunization schedule to the hard-to-reach population in the HF catchment area. Reaching the rural communities through outreach sessions is regarded as the key to success of the EPI program, however the outreach service delivery has been increasingly irregular in every facility area. According to the Sector Performance Annual review of 2014, the national target for rural outreach service delivery per 1,000 children under five years of age is 100, while during 2009-2013 only 35 children served through the outreach service provision.

Target population groups for outreach service delivery differs from one district to another since the catchment areas have not been clearly defined for all facilities of the country. The vaccination sessions are provided by health workers and the transportation costs are covered from the local budgets (LLGs).

Mobile services

Mobile services refer to immunization services provided by the staff of the health facilities to provide all routine immunization antigens included into the national immunization schedule. Target groups for mobile service delivery are the groups of population residing in hard-to-reach geographic locations of the HF geographic catchment area. Similarly, to fixed and outreach service provision, the vaccination sessions are performed by the health workers' transportation costs are covered by the Local Governments (LLG).

(3) Human resource management

Factors such as coordinated training, motivation, supervision and monitoring affect the delivery of qualitative routine immunization services.

The number of staff involved in EPI program implementation in PNG is 7,047, including 3,313 Mid-Level Management (MLM) staff at the province, district and health facility level. The services are delivered by 2,980 service providers (Sisters in charge, nursing officers and Community Health Workers) who devote 25% of their time to the EPI program implementation, through the integrated MCH/EPI service delivery model.

During the 2011-2014 period no trainings have been carried for EPI staff. In 2015 EPI organized delivery of number of different trainings in vaccine management, cold-chain maintenance and micro-planning. The micro-planning training was delivered within the framework of SIREP program. In total 398 trainees participated in the trainings including 98 health workers, who were additionally trained in vaccine and cold-chain management. 300 health workers participated in the training in micro-planning of immunization services.

(4) Vaccine and cold chain management

The information provided in this section is based on the EVM assessment carried out in February – March of 2016.

Fixed Infrastructure and Logistics

There are four supply chain levels: Primary (national), sub-national (province), lowest distribution (district) and service delivery (health center). The number and distribution of the fixed medical stores used by the immunization program are presented in the Figure 19 below:

Figure 19: Distribution of cold-chain stores

Level of the store	Quantity
Area medical store	1
Provincial Vaccine store	20
District Vaccine store	89

Vaccines and immunization supplies (syringes and safety boxes) are transported by air from the manufacturer into the country. The national area medical store located in Port Moresby receives vaccines and injection supplies two times a year from manufacturers. The vaccines and supplies are further distributed from Port Moresby to the most provinces by air except for those facilities that are located in Port Moresby and vaccines could be delivered by vehicles. From the provincial level vaccines stores vaccines are distributed by road or sea, except for three (3) provinces where the distribution is done by air. The complicated transportation of the vaccines from the national to sub-national levels is the main reason for extremely high cost of vaccine distribution in PNG.[21]

For vaccines purchased through UNICEF, UNICEF vaccine arrival reporting (VAR) procedure is ensured, but VAR format currently used for directly purchased vaccine from manufacturer misses some key EVM aspects such as: absence of a) PAR (Product Arrival Report) for dry supplies or consumables, b) contingency plan in case of unexpected delay in the custom clearance and c) SOPs to guide staff on how to properly handle the vaccines.

[21] Over US$ 2 million per annum

One of the key recommendations of EVM assessment was to develop PAR for all safe-injection supplies used for EPI activities. In addition, EPI was recommended to develop a contingency plan and SOPs in case of unexpected flight and transport delays for ensuring vaccine safety and potency at all times.

Procurement

EPI policy for vaccine procurement states that the country procures only WHO pre-qualified vaccines to ensure the quality and safety of vaccines used by the EPI program.

In the baseline year RI vaccines and injection supplies were procured through the mixed procurement system: BCG, OPV and HepB were procured through the government procurement channels using identified domestic supplies. Penta, MR, IPV and PCV vaccines are procured through the UNICEF Supply Division (SD). Based on the recent decision made by EPI on vaccine procurement, from 2016 all Routine Immunization vaccines will be procured through the UNICEF SD mechanism to ensure timeliness of supply and to access vaccines at the best available price.

The annual forecast for vaccines and supplies is based on the number of target population that is calculated based on the 2011 census data. Procurement and distribution of vaccines and supplies is carried out by the national EPI based on the request received from all provinces. The Government covers costs for the procurement of all vaccines included in the routine immunization schedule: BCG, HepB, Measles and TT, while Pentavalent, MR[22], IPV and PCV vaccines are co-financed by the National Government and GAVI. Government also covers costs related to the vaccine distribution. Actual distribution is done by the private transportation company outsourced by the government for this purpose.

EVM Assessment

The first and latest EVM assessment in PNG was implemented in 2011. The next EVM assessment was implemented in 2016.

The EVMA[23] 2016 looked at all four levels of the system (Primary, Sub-national, district and health facility) and revealed the strengths and weaknesses of the vaccine supply chain at all these levels. The main strengths of the system were related to the storage and transport capacity, buildings, equipment, transport quality and maintenance. The weaknesses predominantly were found in the management related criteria, such as arrival procedures for vaccines and commodities, temperature monitoring, stock management, distribution management, vaccine management, vaccine wastage policy and procedures, as well as information management system and supportive functions.

Overall EVM assessment found that vaccine supply chain in PNG has some well-established strengths and that there are examples of excellent practice available at all levels in the supply chain as assessed against major EVM indicators. There strengths can be built upon for further improvement of the system in the country as a whole.

Temperature monitoring practices

National level:

[22] Gavi co-finances only measles portion of the MR vaccine
[23] Effective Vaccine Management Assessment Report, Papua New Guinea, 2016

The primary store do not have a continuous temperature monitoring device and no temperture mapping study of cold room was conducted. The integrated temperature device and fridge tag are used to monitor and record temperatures. Temperature records are not properly filed and no formal review of these records had taken place. The figure below shows a fridge tag used for temperature monitoring and recorded in the temperature monitoring sheet.

Provincial, District and HF levels:

At the provincial level Storekeepers know the correct temperature and for which vaccines can be damaged below 0°C. However, the temperature sheet does not have an entry for alarm events and these temperature records are not kept on file for at least three years. A combination of bimetal, stem thermometer and integrated thermometers are used for monitoring temperature of vaccines.

At the District level the Health staff knows how to read temperatures and records them on the temperature sheet. Temperature records are recorded manually twice daily, but some are not keep on file for 3 years. Bi metal and integrated thermometer are used.

At the health facility level Health staff can give correct storage temperature of vaccines and can demonstrate the correct reading of the type of thermometer used. Twice daily temperature reading is conducted and recorded in a temperature chart. Bi-metal and integrated thermometer are used for reading temperatures. The old temperature sheet is still used where there is no space for entering the temperature at alarm events.

Storage capacity

National level:

The primary store has four operational cold rooms where freeze sensitive vaccines, MR and BCG are kept. Only OPV are stored separately in chest freezers. Net storage capacity is calculated using the EVM assistant tool as shown below and results are summarized are tabulated below:

Figure 20: National Level Storage Capacity

Internal room dimensions

Room length (L)	402	cm		
Room width (W)	340	cm	Gross volume (L x W x H)	36.9 m³
Room/stacking height (H)	270	cm	(in very high rooms enter maximum stacking height)	

Shelf unit dimensions

	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7	Unit 8	Unit 9	Unit 10
Shelf width (w)	60	60	60	60	60	60				
Shelf length (l)	131	131	195	195	131	131				
Nbr of shelves (n)	4	4	4	4	4	4				
Shelf thickness (t)	3	3	5	5	5	5				
Floor to bottom shelf (b)	19	19	19	19	19	19				
Shelf unit volume (litres)	1,206	1,206	1,748	1,748	1,174	1,174				

Net storage capacity	8,257	litres
	8.26	m³
Grossing factor	4.47	

Formulae for manual calculation:

1) Shelf unit volume =(w x l x (H-(b + 10 + n x t))/1000) x 0.67 litres
2) Net storage capacity = ∑(shelf unit volumes) litres
3) Grossing factor = Gross volume/(Net storage capacity/1000)

Total available net storage capacity of cold rooms at Area Medical Store is represented in the Figure 21 below:

Figure 21: Total Available Net Storage Capacity at AMS

Sn	Cold Room #	Gross volume(m³)	Grossing factor	Net storage capacity (m³)
1	Cold room # 3	36.9	4.47	8.26
2	Cold room # 5	36.9	4,47	8,26
3	Cold room # 6	39.1	5.86	6.67
4	Cold room # 7	39.1	5.86	6.67
Total Net storage capacity (m³)				29.86

The total net storage capacity of 29.89 m³ (+2°C - +8°C) is sufficient for the 2016 vaccine storage requirements, however with the introduction of HPV in 2017 and Rota[24] in 2018, a significant increase in the net storage capacity is required. Space for storage of safe-injection supplies are not sufficient at the AMS. The Figure 22 below shows the estimated vaccine storage volume for ten years' period. These estimated volumes are compared to the existing storage capacity to be able to determine and address the vaccine storage gaps.

[24] Rota introduction was postponed for the next cMYP period, however it is still on the Agenda of EPI PNG

Figure 22: Existing and required storage capacity at National Vaccine Store

	Year of vaccine			Estimated gross vaccine storage capacity requirement (m^3)										Existing capacity	
Cold chain level	IPV	HPV	Rota	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Cooler(m^3)	Freezer(liters)
National															
AMS vaccine store	2016	2017	2018	26	29	42	43	45	46	48	49	51	52	30	740

Figure 23 shows cold-chain equipment requirement for National Vaccine Store

Figure 23: Cold-chain equipment requirement and estimated cost for National Vaccine Store

	Year of vaccine			Cold chain equipment requirement/Estimated Cost									
Cold chain level	IPV	HPV	Rota	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
National													
AMS vaccine store	2016	2017	2018	0	1FR-05m^3	1CR-20m^3	1CR-40m^3	0	0	0	0	0	0
	Cold chain equipment summary			0	1FR-05m^3	1CR-20m^3	1CR-40m^3						
	Estimated cost , US$				US$15000	US$40,000	US$60,000						

Taking into account the EPI plans for introduction of new vaccines, the EVM assessment recommended to increase the existing vaccine storage capacity of cold rooms, through procurement of new cold chain equipment to cope with the vaccine storage requirements for introduction of HPV and Rota.

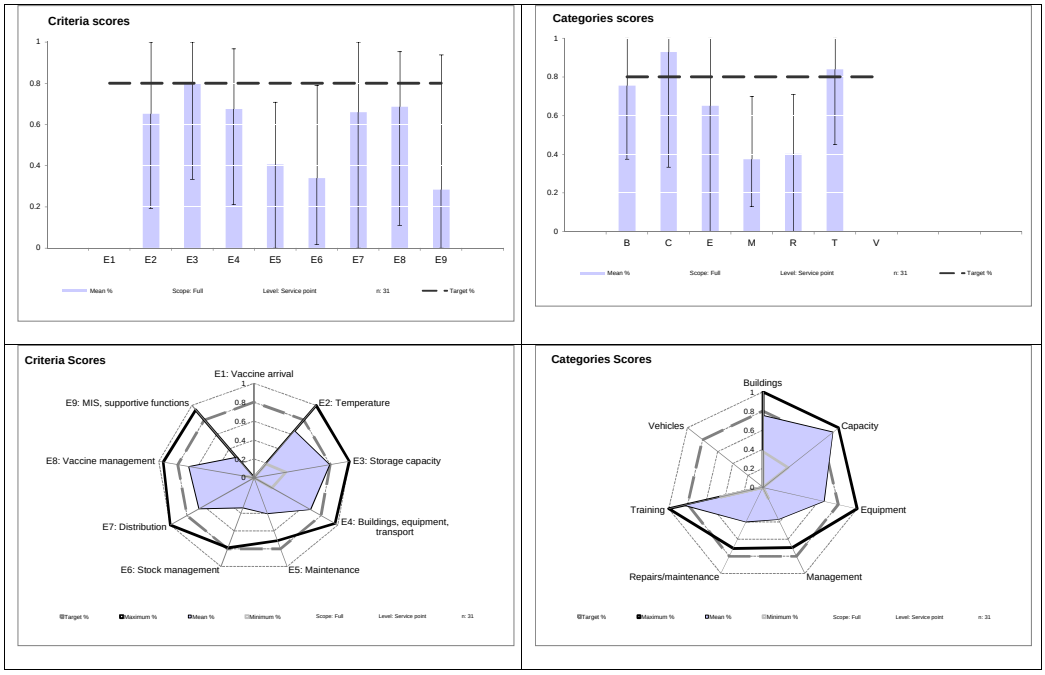
Province, District and HF levels

At the current immunization schedule 50% of the existing vaccine storage capacity of provincial vaccine stores are adequate for vaccines. Storage of safe injection supplies are sufficient.

Storage capacity at the district level stores are adequate for the current need of the districts as some of the health center get their vaccines and safe-injection supplies direct from the provincial store. There are 89 districts in the country and only 8 district vaccine stores (DVS) are so far established. DVS received their vaccines and safe-injection supplies from either the Primary Vaccine store or Provincial vaccine store (PVS). Some districts in other provinces are equipped with cold chain equipment and are able to deliver vaccines to their respective health centers. Out of 21 districts selected by the EVM selection tool only 8 districts were assessed for having cold chain equipment and staff. Of the 8 districts only 1 is a DVS.

The service delivery level is the last level of the cold chain system where vaccine vials are opened and children and mothers are immunized against the vaccine preventable diseases. This is the crucial point and the vaccine cold chain needs to be assured to ensure the integrity of vaccines. Criteria and category of scores of health centers are represented in the Figure 24 below:

Figure 24: Criteria and category of scores of health centers



Stock management

EPI has elaborated and institutionalized National EPI Vaccine Policy. The standards of the supply intervals, safety stock and maximum stock levels set by the policy is presented in the Figure 25 below:

Figure 25: Vaccine Stock Levels and Supply Intervals at all levels

Stock	Location of Vaccine Stores			Service Delivery Levels
	National	**Province**	**District**	
Safety Stock, months	3	1	1	0.5
Supply period/months	6	2	1	1
Maximum stock level/months	9	3	2	1.5

National level:

The national level staff lacks knowledge on stock correct stock management. There is no label on the vaccine shelves which makes it difficult to implement the EEFO. Vaccines are not arranged properly inside the cold room. Vaccines are laid on the floor in their primary packaging. Figures below show some of these bad practices in the national vaccine store.

Province, District and HF levels

There was no computerized stock control system in place and the sub-national level. Stock records for vaccines, diluents and safe-injection devices received and dispatched are incomplete

which makes inventory update very difficult. Physical count and stock record do not match in quantities. Vaccines are not properly arranged in the vaccine refrigerator.

There was no computerized stock control system in place at the Provincial and District levels. Stock records for vaccines, diluents and safe-injection devices received and dispatched are incomplete which makes inventory update very difficult. Physical count and stock record do not match in quantities. Vaccines are not properly arranged in the vaccine refrigerator.

The district level staff do not maintain stock record of vaccines and safe-injection supplies obtained from the physical count or from the records. Staff lacks knowledge on the interpretaion and implementation of the agreed stock level policy.

Health staff do not keep a record of vaccine arrival and dispatch. Physical count of vaccines and diluents are not conducted which resulted to mismatch quantities both during the physical count and record.

Distribution management

National level:

The national level store (AMS) is responsible for collection of vaccine from the port of entry and further dispatching to provincial stores as required.

There is no plan for the distribution of vaccines and safe-injection supplies at the National Level. Vaccine and consumables are released upon the approved requests from the lower level store. Collection and delivery of vaccines and supplies is outsourced to a logistics company who is tasked to distribute vaccines as per request for release from the primary store. Staff know how to perform ice pack conditioning but due to time pressure the conditioning of ice packs is not sufficient and damage to freeze sensitive vaccines is possible. Original vaccine cartons from the manufacturer are used for distribution of vaccines.

Provincial, district and HF levels:

There is no formal distribution plan in place at the sub-national level. Push and pull system are both used in vaccine distribution. Vaccines and safe-injection supplies are dispatched based on the quantity requested and the availability of stock in the primary store.

At the district level Health staff knowledge on ice pack conditioning is sufficient. However there is no record of vaccine received and delivered. Freeze tag is not used during vaccine distribution.

At the service delivery level health staff knows ice pack conditioning. WHO PQS compliant vaccine carrier are used for outreach activities.

Vaccine Management

National level:

Status of vaccine vial monitors are not recorded. MDVP and shake tests have not been applied in the store. Wastage recording system for unopened vials is not in place.

Provincial, district and HF levels:

Staff has sufficient knowledge on shake test and VVM. Vaccine wastage are not being monitored which could results to an inaccurate vaccine forecast.

At the district Health staff knows shake test and interpretation of VVM. Vaccine wastage is not recorded and monitored.

Helath staff know how to reconstitute freeze-dried vaccines and know how to read VVM. Staff lacks knowledge on shake test and MDVP. Vaccine wastage is not recorded and calculated.

Cold chain, buildings, transport

National level:

The primary vaccine store is housed in the Area Medical Store where all medical supplies are also stored. With the increase of storage volume of medical supplies and EPI supplies NDOH outsourced collection, delivery and storage of vaccines and safe-injection supplies to a logistics agent. Store manager office is not equipped with computer for the continuous temperature monitoring device. The store has no vehicle for collection of monitoring and supportive supervision tasks to the lower levels. AMS building will soon be renovated and all cold rooms will be shut down.

At the sub-national level Cold chain equipment are secured in suitable buildings. Sufficient space is available for dry supplies and consumables. Types and models of cold chain equipment in the province comply with WHO specifications.

At the lowest distribution level cold chain equipment are installed usually in the new buildings of district hospitals. The cold-chain capacity is adequate to the district needs, however district level is not responsible for distribution of vaccines among the health facilities.

At the health facilities the building space is adequate and vaccine cold chain equipment is WHO PQS compliant. Vaccine carriers, cold boxes and ice packs are available in sufficient quantity. However, there are still significant number of liquid petroleum gas fueled refrigerators and there's no telecommunication link between health centers and districts or province.

The LD logistics transport agency is contracted to collect and deliver vaccines and safe injection devices to provinces and districts. From the airport vaccines are collected and delivered to the national vaccine store and from the national vaccine store these are delivered to the airport onward to the provinces or districts.

Information management systems and supportive functions

National level:

There is a lack of regular technical support for the storekeeper at the Primary vaccine store. There is only one regular staff who had received training in cold chain and vaccine management. The other staff assists the regular staff in packing vaccines and checking the temperatures. However, there was no formal training on cold chain and vaccine management. Cold chain inventory is available but this was not updated on regular basis.

Province, district and HF levels:

At the provincial level cold chain equipment inventory is prepared but not updated. There are cold chain equipment that were already transferred to a certain location but this was not indicated in the inventory. No work plan or budget allocation for monitoring and supportive supervision.

There is no SOP for reference in case vaccine and stock management occurs. No record of training or supportive supervision conducted.

At the Health Facility levels, the Health staff is not involved in the estimation of vaccines and safe-injection equipment. There were no on-the-job trainings or supportive supervision activities carried out for HF level health staff.

(5) Surveillance, monitoring and reporting

Surveillance is very important for monitoring the status of vaccine preventable diseases. It requires that all reports are received complete and timely, from health centers to the central level.

There are several parallel surveillance systems operating for surveillance of vaccine preventable diseases (VPD).

The current state of the surveillance system of the country against the surveillance indicators is presented in the Figure 30 below:

Figure 26: Summary of the surveillance indicators[25]

Component	Suggested indicators	2014
Routine surveillance	% (Completeness) of surveillance reports received at national level from Provinces	11%
	AFP detection rate / 100,000 population under 15 years of age	0.9
	Percentage suspected measles cases for which a laboratory test was conducted	unavailable
	Sentinel surveillance for rotavirus established	Yes
	Sentinel surveillance for meningitis (Hib / PCV) established	Yes
	Percentage of suspected meningitis cases tested for Hib / pneumococcal diseases according to standard protocol.	Yes
	% monthly timeliness of reports	11
	% monthly completeness of reports	11
Coverage monitoring	% gap in match between DPT3 survey coverage and official reported figure	unavailable
Immunization safety	Percentage of states that have been supplied with adequate number of AD syringes for all routine vaccines	unavailable
Adverse events	National AEFI system is active with a designated national committee	Yes
	Number of serious AEFI cases reported and investigated	unavailable

EPI Routine Surveillance System

- **Sentinel surveillance** for rotavirus and meningitis has been established. Percentage monthly timeliness and completeness of reporting has also improved from 30% and 50% in 2010 to 67% and 90% respectively in 2014. In total eight provincial hospitals have been identified as the sentinel sites for the Meningitis Encephalitis Surveillance in the country and the Institute of Medical Research, Goroka has been identified as the sentinel site for the rotavirus surveillance.

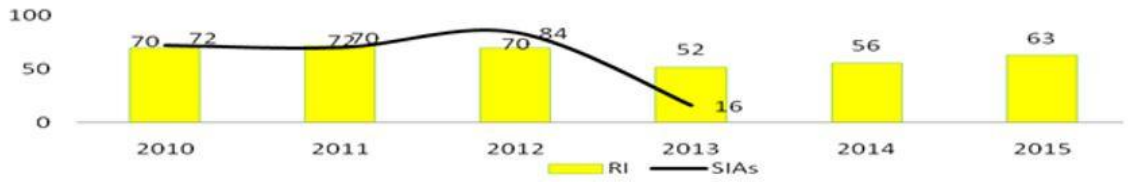
[25] PNG HMIS reports

- **National AEFI** was created in 2013. In total 18 serious cases were detected by the surveillance system out of which 16 cases were investigated. During the period January – October 2015 total of 5,238 cases were reported

AFP Surveillance

A sensitive AFP surveillance system along with high OPV3 coverage remains the backbone towards maintaining the polio free status in the country. The OPV3 coverage in the country over past few years has been decreased, with wide provincial and district variation. In 2014 only 20% of the provinces recorded an OPV3 coverage of more than 80%, alarming about a high risk of any impending outbreak following importation of the disease from endemic countries in the light of the increased industrialization and migration of people from different parts of the world to Port Moresby and another industrial belt of Papua New Guinea.

Figure 27: OPV3 coverage % from 2010 – 2015 in PNG



Source: HMIS PNG, EPI

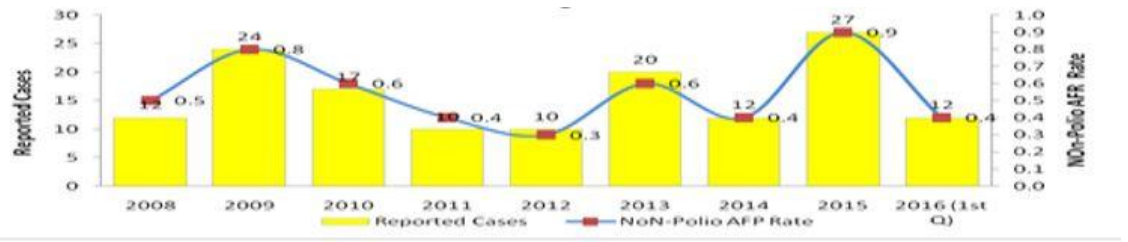
Non-polio AFP surveillance performances rate of Papua New Guinea is improving in trend. In 2015 total of 27 AFP cases were reported through the routine sentinel surveillance system with AFP rate of 0.9, which shows relative improvement when compared with previous year.

In 2015 50% of provinces (11) did not achieve the expected non-polio AFP rate and sentinel surveillance sites and provincial health authorities did not report a single non-polio AFP cases. The reports on weekly surveillance results from the provinces are mainly sent through phones and faxes, which is often is not the most reliable method. The timeliness and completeness of weekly surveillance was sub-standard and estimated to 10%.

For that same year, the targets for timely collection of stool specimen within two weeks of the onset of paralysis was estimated at 88.5%.

The details on the expected and reported AFP cases are illustrated in the Figure 28 and Figure 29 below:

Figure 28 AFP rate and number of cases in PNG, 2008-2016 (Q1)



Source: HMIS PNG, EPI

Figure 29: Expected and Reported AFP Cases by Provinces, PNG 2015

Province	2015	< 15 Pop	Expected NPAFP	Reported # of NPAFP Cases	NPAFPR Annual	AFP cases with 2SS<2WKs/14 dyas onset
PNG	8,235,782	2,931,938	29	27	0.9	82%
Western Province	222,527	79,220	1			
Gulf Province	182,699	65,041	1			
Central Province	310,293	110,464	1			
NCD	415,506	147,920	1	5	3.4	50%
Milne Bay	305,593	108,791	1			
Northern Province	210,905	75,082	1			
Southern Highlands	579,920	206,452	2	3	1.5	100%
Hela	277,898	98,932	1			
Enga Province	496,970	176,921	2			
Western Highlands	412,398	146,814	1	2	1.4	100%
Jiwaka	430,352	153,205	2			
Chimbu	431,318	153,549	2			
Eastern Highlands	643,374	229,041	2	4	1.7	100%
Morobe	731,013	260,241	3	1	0.4	100%
Madang	550,235	195,884	2	4	2.0	75%
East Sepik	497,913	177,257	2	2	1.0	25%
West Sepik	275,637	98,127	1	1	1.0	100%
Manus	68,197	24,278	0	1	4.1	50%
New Ireland	232,340	82,713	1			
East New Britain	379,228	135,005	1			
West New Britain	301,554	107,353	1	3	2.8	100%
AROB Province	283,409	100,893	1	1	1.0	100%

Source: HMIS PNG, EPI

Accelerated Disease Control Surveillance

Measles

PNG uses the measles case-based surveillance system. The measles case-based surveillance uses the same surveillance structure as the AFP surveillance with support of Central Public Health Laboratory in Port Moresby.

Since September 2013 PNG has reported 2,262 laboratory confirmed measles cases and 73,181 clinically suspected cases from all 22 provinces of the country. More than 312 deaths were reported up to end of December 2014 with the case fatality rate of 43%. Detail information on the expected and reported number of suspected measles cases is reflected in the Figure 30 below:

Figure 30: Measles AFR Cases (2015)

Province	2015	Expected # of suspected measles cases	Reported # of suspected measles cases	# of discarded measles cases (targets 2/100,000	Annual rate of discarded measles cases
PNG	8,235,782	165	6332	156	2
Western Province	222,527	4	90	58	26
Gulf Province	182,699	4	82	0	-
Central Province	310,293	6	142	3	1
NCD	415,506	8	19	48	12
Milne Bay	305,593	6	20	12	4
Northern Province	210,905	4	1383	0	-
Southern Highlands	579,920	12	304	15	3
Hela	277,898	6	0	11	4

Enga Province	496,970	10	128	0	-
Western Highlands	412,398	8	325	4	1
Jiwaka	430,352	9	0	0	-
Chimbu	431,318	9	468	2	0
Eastern Highlands	643,374	13	292	0	-
Morobe	731,013	15	129	0	-
Madang	550,235	11	1240	0	-
East Sepik	497,913	10	278	0	-
West Sepik	275,637	6	103	0	-
Manus	68,197	1	169	0	-
New Ireland	232,340	5	168	0	-
East New Britain	379,228	8	11	0	-
West New Britain	301,554	6	570	0	-
AROB Province	283,409	6	411	3	1

Source: EPI PNG, HMIS.

During the 2015, suspected cases are still being reported from the provinces. In 2015 a total of 12,664 clinical cases were reported (NHIS) and among the 158 blood samples sent to the CPHL. The annual rate of discarded measles cases was 54.

Hepatitis B and Neonatal Tetanus (NNT)

There were no Hepatitis B and NNT surveillance systems established in the PNG and the case detection and reporting systems are sub-standard. The cases of MNT and Hepatitis B are reported from the in-patient facilities to the districts, who further submits the reports to the national health management information system through the standard reporting forms.

(6) Immunization financing

The costing and financing of the immunization system is highly dependent upon the donors' contribution. During the previous cMYP cycle vaccines have been procured through the mixed procurement mechanism considering procurement through the UNICEF Supply Division and the local suppliers. Starting from 2016 all vaccines will be procured exclusively from the UNICEF SD. The Government's contribution towards procurement of vaccines is in the form of co-financing of GAVI supported vaccines and procurement of vaccines included in the national immunization schedule.

The government allocates funds for vaccine procurement under the special budget line item "Medical Supplies and Pharmaceuticals", however there is no dedicated budget line for the vaccines.

Funding for salaries and operations of National EPI office are directly supported from Government allocations. The service delivery at the health facility level is also financed by the central government, but through the Province financial allocations.

(7) Demand generation, communication and advocacy

Demand generation, communication and advocacy are important for multiple reasons. These provide an opportunity to use EPI data as evidence to create awareness on importance of immunization for reducing morbidity and mortality due to vaccine preventable diseases. These activities not only enhance acceptability of immunization services but also create opportunities to secure support from communities and other stakeholders like political leadership at all administrative levels and especially at the provincial level, which provides leadership in implementation of all public health interventions in the country.

Communication and advocacy have been the weakest point of the national immunization program during the recent years. No strategies were developed and institutionalized to ensure active

participation of all different groups within communities to support the national immunization program.

In the Special Integrated Routine EPI Strengthening Program (SIREP) which will be the main driver of NIP implementation at all levels, community mobilization and participation is set as one of the key objectives aiming at increasing awareness of EPI target communities on immunization related issues and generating demand in immunization services among the PNG communities. The strategies elaborated by EPI for achieving this objective include development of health facility social mobilization plans and materials for social/community mobilization; training of CHWs in application of the social marketing/community mobilization methods and materials, engagement of CHWs to mobilize caregivers to access and utilize EPI/MCH services in their respective communities. In addition, the EPI will implement set of activities to advocate immunization program to the Provincial leadership and decision maker groups to secure their active participation and support for effective implementation of the NIP in the respective provinces.

1.4.5 Summary of the analysis - SWOT

Program Management	
Strengths	**Weaknesses**
• Availability of legislation (organic law) • Availability of policy (NSP, LTDS, NHP, FHSSIP, PHA). Clearly defined roles and responsibilities in NHP, FHSSIP • Availability of policies and guidelines • Regular high level advocacy with the legislature • Availability of an effective Management and Leadership Practices (high performing provinces) • Powerful ICC	• Lack of strong leadership at the provincial level • Weak capacity of enforcement of central level decisions at the provincial and district levels • Weak supervision and monitoring mechanisms at all levels • Lack of the HR management capacity at all levels • Lack of mid-level managers at district and provincial levels • Lack of skilled front-line service providers - (health workers, nurses, village health volunteers (also attributed the Human Resource Management) • Weaknesses in MCH/EPI integrated service provision model and lack of integration among service providers • Fragmentation of the management and service delivery • Mal-distribution of the health facilities across the country • Mal-distribution of the service providers across the health facilities • Absence of the system for evaluation and revision of cMYP • Lack of buy-in by the community (engagement of the community members in RI services attributed to the Communication, Social Mobilization and Demand Generation • Lack of effective and working accountability systems showing impact of resources spent • Poor micro planning at health facility level • Inadequate supportive supervision • Lack of clarity in roles and responsibilities at the national and sub-national level
Opportunities	**Threats**
• Political will and financial commitment to fund immunization services at all levels • Facility based financing • Strengthening the leadership • Strengthening Public Private partnership arrangements • Improved coordination between the state actors and programs	• The general view that the availability of legislation, policy and systems will solve all health challenges • Exit of GAVI and other donor agencies rebasing of the economy • Change of government • Attitude of some health workers • Security issues at the sub-national level

• Introduction of technological innovation (NHIS)	• Poor economy – emerging fiscal crisis
Human Resource Management	
Strengths	**Weaknesses**
• The "Health Workforce Enhancement Plan is Available" • Amended legislation to increase retirement age for health workers • Availability of training materials and guidelines • Loyalty and dedication of the existing staff at all levels	• Insufficient number of the fulltime dedicated managerial and supervisory EPI staff at all levels • Insufficient number of front line service providers – Health workers and Village Health Volunteers at the LLG level • Lack of HR capacity to conduct regular outreach and mobile sessions, even when funds are available; • Insufficient knowledge of CHWs in immunization protocols • Inadequate training capacity (lack of trainers) at all levels • Lack of training opportunities for the EPI staff at all levels
Opportunities	**Threats**
• Revise and update the available training materials • Training of nurses/community health workers • Increasing focus on community village health volunteers	• Training programs heavily dependent upon funding from donors • Inequitable distribution of health staff between urban and rural areas
Costing and Financing	
Strengths	**Weaknesses**
• Health sector long-term financing policy developed • EPI activities financed under MCH • Commitment of the Government to contribute for procurement of vaccines through co-financing share • Availability of budget development rules and procedures	• Inadequate public financial management system (allocation, execution, reporting) for RI at national and sub-national levels • Lack of funding support from provinces and districts to provide mobile and outreach services • EPI managers are not trained in costing and financing • Lack of a dedicated budget line item for national immunization program and vaccine procurement in the national and sub-national budgets • Prolonged, complicated and inefficient procedure for releasing of fund for EPI program at the provincial level
Opportunities	**Threats**
• Advocacy of EPI activities with the Key Policy- and decision-makers of the country at the national and sub-national levels • Donor support from GAVI and other development partners	• Heavy dependence on donor funding may lead to donor fatigue
Vaccine security and logistics	
Strengths	**Weaknesses**
• Commitment of Government to allocate budget for vaccine procurement and co-financing of GAVI vaccines • Availability of the EVM Assessment and improvement plan • Utilization of the UNICEF SD mechanism for procurement of vaccines, injection supplies and cold-chain equipment	• Inadequate vaccine management practices resulting of the vaccine shortage at the service delivery points; • Ageing cold-chain equipment • Lack of effective logistical systems and assessment tools and practices for regular assessment of the Cold Chain performance • Lack of vaccine wastage policy • Inadequate data collection tools • Inadequate trained personal to handle maintenance of the cold chain equipment. • Inadequate immunization waste management equipment and system.
Opportunities	**Threats**
• Presence of development partners willing to support and collaborate in providing RI services (implementation of SIREP and SIREP Plus programs).	• Staff shortage on District and LLG levels • Existence of the Hard-to-reach areas

Immunization Service Delivery	
Strengths	**Weaknesses**
• Extensive network of 745 fixed EPI centers across the country • EPI as established part of the integrated service provision model • Availability of SIREP and SIREP Plus strategies for acceleration of RI activities • Timely availability of bundled vaccines	• Non functional health facilities • Long waiting periods demotivating mothers to bring their children to HFs for vaccination • Practice of charging of user fees to run operational costs of HFs • Inconvenient location of the HFs (along the roads rather than close to the communities; • Unfavorable weather conditions to reach hard-to-reach population; • Lack of human resources for providing outreach and mobile vaccination sessions • Preference of EPI staff at provincial and service delivery levels – to provide services through SIA rather than through RI activities (due to financial incentives) • High dropout rates between successive vaccine doses; • Insufficient integration of EPI and MCH services • Low utilization of health centers • Lack of data at the health facilities on target population and denominators (attributed to the MIS as well) • Unavailability of all routine immunization antigens in about 20% of planned RI sessions triggering increase of missed opportunity rates • Weak community engagement in RI service delivery (also attributed to the advocacy, communication and demand generation) • Poor attitude of health workers/front line service providers at the service delivery points • Insufficient assessment of actual coverage and absence of daily feedback for designing and implementation of the corrective measures.
Opportunities	**Threats**
• Implementation of SIREP and SIREP Plus programs • Capacity strengthening of the management systems • Capacity strengthening of HWs at all levels for improving service delivery	• Poor commitment of some provincial level political leaders to RI services • Inadequate funding for RI at all levels due to decline in national revenue • Inadequate human resources for improving RI service delivery • Security issues all over the country • Poor integration of MCH and EPI services
Accelerated Disease Control and Surveillance	
Strengths	**Weaknesses**
• Availability of the routine immunization monitoring system • Availability of the AFP surveillance system • Availability of the accelerated disease control surveillance system • Availability and support of Central Public Health Laboratory in Port Moresby	• Lack of Hepatitis B and MNT surveillance systems • Lack of knowledge of the EPI staff and service providers in utilization of surveillance system tools; • Lack of AEFI management tools at sub-national, district and HF levels
Opportunities	**Threats**
• Implementation of the surveillance components of SIREP and SIREP Plus programs • Usage of available EPI capacity to develop and institutionalize surveillance systems	• Lack of professional capacity to develop and institutionalize surveillance systems • Lack of willingness of Provincial level leadership to support surveillance system institutionalization • Challenges in security compromised area

Advocacy, Communication and Demand Creation	
Strengths	**Weaknesses**
• Involvement of church in service delivery • Strong and capable leadership at NDOH	• Lack of comprehensive knowledge in advocacy and communication at high levels • Lack of social mobilization plans (especially at District and health facility levels) • Low capacity of personnel / Lack of skilled service providers (especially in rural/ hard to reach areas) • Personnel are inadequately equipped with communication skills • Lack of adequate IEC materials for promotion of the Routine Immunization concept • Inadequate funding of advocacy / communication activities (at all levels) and outreach services due to the given low priority • Social mobilization activities are more focused on SIAs
Opportunities	**Threats**
• Development partners support • Involvement of top political leadership in EPI • Traditional/Religious institutions • Media, E-health, Social media	• Insecurity in parts of the country • Staff shortage at the service delivery points • Poor political will at all levels
Management Information System	
Strengths	**Weaknesses**
• Willingness of the key stakeholders to introduce effective HMIS in the country • Availability of the HMIS pilot projects in four Provinces – web-based real-time database	• Inaccurate assessment of target population; • Non-utilization of child health register and ANC register to update the actual target population • Inaccurate reporting of the number of vaccinations against set targets • Poor quality of data nationwide • Denominator issues: Varying target populations for RI and campaigns in the same population, most times making planning and reporting difficult • Inadequate electronic systems and tools at the provincial and district levels • Inadequate revised data collection tools (at Provinces and HFs) • Dependency of states on partners for the monthly RI review and feedback systems. • Inadequate supportive supervision (SS) especially at the subnational levels; and • Poor feedback from the Provinces, districts and health facilities
Opportunities	**Threats**
• Roll-out the pilot HMIS web-based system across all provinces • Availability of RI meetings to re orient staff on data management • Willingness of Partners to support government to improve data quality	• Inability of health workers to utilize HMIS tools and practices • Insecurity in some parts of the country • Inadequate political commitment to support HMIS

2 Immunization objectives and strategies

2.1 Program Objectives and Milestones

The overall goal of the National Immunization Program is to decrease VPD related morbidity through reaching every child and mother with high quality immunization services:

- Sustain polio free status
- Zero cases of neonatal tetanus by 2020
- Zero cases of measles by 2020
- Progress towards Hepatitis B control

In order to attain the goal, the EPI program objectives for 2016-2020 are as follows:

- Improve routine immunization coverage: fully vaccinated children (FIC) >=95% of the target population at the national level and at least 95% of target population at the district level by 2020
- Improve routine immunization equity:
  - Geographic: the number of districts with
    - less than 95% coverage for all antigens - 0 (out of 89) by 2020
    - Less than 95% coverage for measles – 0 (out of 13) by 2020
    - Reducing percentage gap in Penta3 coverage between the highest and lowest performing provinces to 10% by 2020

The improvement in the performance of the immunization system will be measured in terms of coverage and equity as listed in the Figure 31 below:

Figure 31: Indicators and milestones of cMYP 2016-2020

Indicators	Baseline 2014	2016	2017	2018	2019	2020
1. Increase BCG coverage	81%	85%	85%	85%	90%	95%

2. Increase Hep-B birth dose coverage	31%	90%	90%	90%	95%	95%
3. Increase OPV3	53%	60%	70%	80%	90%	95%
4. Increase Measles-Rubella-1 coverage		60%	70%	80%	90%	95%
5. Increase Penta3 coverage	62%	65%	70%	80%	90%	95%
6. Increase TT 2+ coverage among pregnant women	50%	60%	70%	80%	90%	95%
7. Increase TT coverage among school age Group		60%	70%	80%	90%	95%
8. Increase PCV coverage		60%	70%	80%	90%	95%
9. Increase IPV coverage		60%	70%	80%	90%	95%
10. Introduce HPV				60%	65%	70%
11. Increase the % of children fully immunized (under 1 year)	62%	65%	70%	80%	90%	95%
12. Decrease dropout rate between Penta1 and Penta3 coverage	21%	20%	15%	10%	5%	0.0%
13. Improve geographical equity - % of districts that have at or above 50% Penta3 coverage	51%	55%	60%	70%	80%	95%
14. Improve geographical equity - % of districts that have at or above 90% Penta3 coverage	13%	20%	40%	60%	80%	95%

An implementation plan with a timeline is provided in Annex 4 **Error! Bookmark not defined.**.

2.2 Strategies and main activities

2.2.1 Overview of strategies and key actions

According to the results of situational analysis, the following key actions are required to improve the EPI performance:

1. Training of immunization service provider staff on development and utilization of micro-plans for ensuring high quality service delivery;
2. Training of EPI staff at central, provincial and district level to support the provincial, district and health facility level health teams in supportive supervision, reporting, developing and implementing micro-plans and validation of the information;
3. Integrate EPI with MCH health interventions
4. Scaling-up outreach and mobile services provision through application of SIREP and SIREP Plus strategies, especially in hard-to-reach geographical locations to visit every village at least once in a quarter;
5. Provide logistic support for the above mentioned outreach sessions;
6. Introduce HPV vaccine at the national level in 2018;
7. Conduct MR and TT SIAs in the high risk communities in 2018 and 2020;
8. Introduce and support the Switch from tOPV to bOPV as per the global Polio Endgame strategy;
9. Improve vaccine management practices through implementation of the EVM Assessment Improvement plan;
10. All the Health Facilities to be provided cold chain equipment for establishing Fixed EPI centers;
11. Guidelines and Tools development for streamlining the EPI related information system;
12. Conducting systematic and periodic reviews at national, provincial, district and health facility levels for monitoring and nurturing a culture of accountability;
13. Improve VPD surveillance system and train all EPI and service provider staff on VDP surveillance;
14. Training of all health staff on VPD surveillance;
15. Development and implementation of the MCH/EPI integrated communication plan through implementation of SIREP and SIREP Plus strategies for improvement of coordination between EPI program and all other MCH program areas;
16. Design and implement awareness raising and social mobilization campaigns;
17. Design and implementation of the advocacy plan targeting key stakeholder groups with major emphasis on key policy- and decision-makers at all levels;

The proposed strategies and key activities are defined by the immunization system components below.

2.2.2 Strategies and activities by the immunization system components

The following strategies were proposed to achieve the cMYP objectives and targets:

Service Delivery

SO1: To reach coverage of immunization of more than 95% of target population at the national level and at least 95% of target population at the district level and ensure equity in immunization service delivery through reducing percentage gap in Penta3 coverage between the highest and lowest performing provinces to 40% by 2020

The objective of the immunization system component is to increase coverage of immunization target groups with all antigens included in the national routine immunization schedule. It means by 2020:

- All health facilities have sufficient number of skilled immunization staff;
- All health facilities are equipped with cold-chain equipment to perform fixed site immunization services;
- All health facilities conducting regular outreach and mobile activities for reaching hard-to-reach communities;

Strategies and activities to achieve the component objective are as follows:

Strategy 1.1: To achieve > 95% Pent3 coverage among immunization target groups in at least 90% of the Provinces/Districts and LLGs by 2020 through effective implementation of SIREP and SIREP+ Programs

Activity 1.1.1: Provide Integrated service provision Management Training for frontline service providers

Activity 1.1.2: Provide MLM training for EPI managers

Activity 1.1.3: Ensure Utilization on-the-job training methods such as Mentorship, and supportive supervision

Activity 1.1.4: Develop a list of high risk communities and collaborate with local authorities for household registration for immunization and other health services

Activity 1.1.5: Accelerate service delivery through outreach and mobile sites

Activity 1.1.6: Conduct supportive supervisory visits at the operational level

Activity 1.1.7: Expand RI service delivery services to all HFs through establishment of best practices of fix-site service delivery

Activity 1.1.8: Train HWs and EPI staff in micro planning at all levels

Strategy 1.2: To reduce the percentage gap in Penta3 coverage between highest and lowest performing provinces to 30% by 2020

Activity 1.2.1: Develop the micro-plans for low performing districts

Activity 1.2.2: Scale up outreach and mobile sessions to reach the hard-to-reach communities at least four (4) times a year

Activity 1.2.3: Increase immunization services (fixed and outreaches) in the hard-to-reach communities

Activity 1.2.4: Increase frequency of routine immunization sessions in urban facilities

Activity 1.2.5: Conduct supportive supervision and monitoring of RI (fixed and outreach sessions)

SO2: To sustain polio free status

Strategy 2.1: Increase coverage with polio vaccine through RI to 95% by 2020

Activity 2.1.1: Increase RI sessions (fixed and outreach) in identified polio high risk Districts/LLGs

Activity 2.1.2: Conduct Planned 'Polio End Game' Activities (mop up operations)

Strategy 2.2: Switch from tOPV to bOPV in the Routine Immunization Schedule

Activity 2.2.1: Implement preparatory activities (advocacy, sensitization, training, cold chain assessment)

Activity 2.2.2: Implement the national polio switch plan to switch from tOPV to bOPV

SO3: To eliminate Maternal-neonatal tetanus by 2020

Strategy 3.1: Improved RI coverage with TT

Activity 3.1.1: Conduct TT SIAs in 2018 and 2020

Strategy 3.2: Accelerated TT outreach in high risk areas

Activity 3.2.1: Use existing community mob/linkage activities to effectively target pregnant women

Strategy 3.3: Increase ratio of clean deliveries

Activity 3.3.1: Accelerate outreach for TT vaccination of CBAW in identified MNT high risk provinces and districts

Activity 3.3.2: Produce and disseminate IEC materials on TT importance /vaccinations

Activity 3.3.3: Capacity building (Train, retrain, equip) of health workers and VHVs on clean delivery practices

SO4: To eliminate measles by 2020

Strategy 4.1: To reduce measles morbidity by 90% and mortality by 95% by 2020

Activity 4.1.1: Activities 1.1.1. – 1.1.5.

Activity 4.1.2: Conduct MR SIAs in 2018 and 2020

SO5: Hepatitis B Control

Strategy 5.1: Increase coverage of Hepatitis B vaccine

Activity 5.1.1: Train immunization service provider staff in administration of the Hepatitis B vaccine;

Activity 5.1.2: Send circular and reminder notes to all HFs to give Hepatitis B birth dose within 24 hours of birth

SO6: Introduction of new vaccines in routine immunization schedule

Strategy 6.1: Introduce HPV vaccine at the national level through application of SIREP Plus strategy

Activity 6.1.1: Develop the basic guide and manual for HPV Vaccine delivery

Activity 6.1.2: Reach stakeholder consensus on the guide and manual

Activity 6.1.3: Finalize guide and manual

Activity 6.1.4: Develop a micro-plan for HPV introduction

Activity 6.1.5: Conduct HPV Demo project

Activity 6.1.6: Analyze results of the DEMO project and document the lessons learnt

Activity 6.1.7: Introduce HPV vaccine into RI schedule

Activity 6.1.8: Conduct HPV vaccine post-introduction evaluation

Activity 6.1.9: Document lessons learnt

Demand Generation and Communication

SO7: Increase awareness and generate demand for immunization through effective coordination and collaboration among the communities and key stakeholders in NIP implementation as measured by decreased DTP1-DTP3 dropout rate

It means that by 2020:

- % of parents with children under 1 year of age aware of at least two benefits of immunization is increased by 25% from the baseline
- % of parents with children under 1 year of age who can identify the nearest immunization center is increased by 25% from the baseline
- 90% of financial resources (secure + probable) are mobilized vs. planned
- Coverage targets and objectives are revised/adjusted to the availability of funding

Strategies and activities to achieve the component objective are as follows:

Strategy 7.1: Implementation of SIREP strategy to ensure the availability of an MCH/EPI integrated communication plan for routine/supplemental immunization and surveillance activities in at least 75% of the provinces by 2020sd

Activity 7.1.1: Develop and institutionalize the integrated MCH/EPI communication plan through active collaboration with other PH programs

Activity 7.1.2: Implement the integrated communication plan at all levels

Activity 7.1.3: Train EPI staff at all levels in application the tools and materials of the integrated communication plan

Activity 7.1.4: Produce and distribute IEC and social mobilization materials among the target population at all levels.

Strategy 7.2: Implementation of the SIREP strategy to contribute in demand generation of communities for immunization services, through increasing awareness and participation of communities in the RI implementation

Activity 7.2.1: Design and implement Awareness Raising/ Social Mobilization campaigns targeting all major stakeholders at all levels with the special emphasis on communities

Activity 7.2.2: Develop materials for social/community mobilization activities

Activity 7.2.3: Train HW in application of the social community mobilization methods and materials

Activity 7.2.4: Engage community health workers to mobilize caregivers to access and utilize integrated EPI/MCH services in their communities in their respective communities

Activity 7.2.5: Develop social mobilization plans for Health Facilities

Activity 7.2.6: Organize meetings with community members to ensure their participation on Awareness raising and social mobilization activities

Strategy 7.3: Improve collaboration with the key stakeholders

Activity 7.3.1: Establish effective and regular communication channels with the key stakeholder groups at all levels for ensure their participation/contribution in implementation of the RI.

Activity 7.3.2: Conduct regular business meetings with the key stakeholder groups to ensure their participation and contribution in the planning and implementation of the EPI

Strategy 7.4: Implementation of the advocacy plan targeting key stakeholder groups with the major emphasis on advocacy among the, policy- and decision-makers at all levels

Activity 7.4.1: Develop of the advocacy plan

Activity 7.4.2: Conduct advocacy meetings with the high level political leadership and representatives of the ministries on the roles and responsibilities of key actors in implementation of the EPI

Activity 7.4.3: Conduct advocacy meetings with participation of provincial authorities, political leaders at the district level, opinion makers at the HF level on the roles and responsibilities in EPI implementation

Strategy 7.5: Engage Mass Media in promotion of the EPI

Activity 7.5.1: Sensitize media organizations on immunization issues as corporate social responsibility to attract free/discounted space/airtime

Activity 7.5.2: Develop a comprehensive media plan

Activity 7.5.3: Develop social marketing products appropriate for the country

Activity 7.5.4: Distribute social marketing materials in the identified media products (digital media, print media and etc.)

Vaccine security, cold chain and logistics management

SO8: Availability of the high-standard vaccine management systems ensuring regular high quality vaccine supply at all levels

The objective of the immunization system component is to improve/sustain uninterrupted supply of vaccines to immunization service delivery. It means that by 2020:

- Stock out at facility level is zero
- National EPI Store with Average EVM score above 90%
- 80% of Provincial stores with average EVM score above 80%
- 70% of district stores with average EVM score above 80%
- 70% of Health Facility EPI Stores with average EVM score above 80%

Strategies and activities to achieve the component objective are as follows:

Strategy 8.1: Implementation EVM improvement plan

Activity 8.1.1: Provide cold chain/vaccine management training for cold chain staff

Activity 8.1.2: Forecast, order and supply vaccines to all states / LGAs / SDPs

Activity 8.1.3: Procure additional cold chain equipment to bridge identified gaps from the EVMA, according to 5-year cold chain plan

Activity 8.1.4: Develop and use of a standardized arrival form for consumables

Strategy 8.2: Improve vaccine arrival procedure

Activity 8.2.1: Develop and use of a standardized arrival form for consumables

Strategy 8.3: Improve temperature monitoring system through putting in place a system of early detection and action for safe-keeping of vaccines

Activity 8.3.1: Place functional temperature recorders in all cold rooms

Activity 8.3.2: Map temperature of all cold and freezer rooms

Activity 8.3.3: Review monthly and keep temperature records at all levels.

Strategy 8.4: Enhance the cold-chain maintenance system

Activity 8.4.1: Develop and institutionalize preventive maintenance plans at all levels of the cold chain

Activity 8.4.2: Increase the quality of stock management

Activity 8.4.3: Implement live computerized stocks management system

Activity 8.4.4: Training of the cold-chain technicians in application of the stock management system tools

Strategy 8.5: Improve distribution of vaccines at all levels

Activity 8.5.1: Application of the push system for vaccines and devices at all levels tied to the coverage (quarterly from national to regions and provinces, monthly from districts to HFs)

Strategy 8.6: Build capacity of cold chain officers to maintain cold chain equipment

Activity 8.6.1: Train health workers on vaccine forecast, stock management, vaccine wastage management, monitoring and supportive supervision

Activity 8.6.2: Provide adequate revised management tools at all levels

Activity 8.6.3: Monitor and supervise teams at the subnational levels

Activity 8.6.4: Expand the use of incinerators at state and service delivery levels for proper immunization waste management

Surveillance and reporting

SO9: To strengthen & sustain disease surveillance and HMIS for targeted VPDs and ensure availability of the quality data on RI at district and provincial levels with reporting rate of immunization to 95% by 2020

It means that by 2020:

- 80% of reporting units receiving satisfactory DQS score
- 100% reporting units submit their reports within stipulated time period
- 95% of the submitted reports are completely filled
- Drop-out rate between Penta-1 and Penta-3 remains less than 5%

- At least 2 non-polio AFP cases per 100,000 population are detected and reported
- At least 2 discarded non-measles cases per 100,000 population are detected and reported

Strategies and activities to achieve the component objective are as follows:

Strategy 9.1: Improve disease surveillance and reporting systems

Activity 9.1.1: Active AFP surveillance in all Provinces combined with other VPDs (MNT & measles) surveillance

Activity 9.1.2: Training & retraining of HWs on case identification & reporting in all Health Facilities

Activity 9.1.3: Establish data base on DSR

Activity 9.1.4: Hold regular/quarterly meetings on AFP surveillance with the relevant stakeholders

Strategy 9.2: Strengthen case-base and laboratory-based surveillance

Activity 9.2.1: identify laboratories for collaboration on Polio & measles lab base surveillance

Activity 9.2.2: Train managers and frontline health workers on data management for effective feedback on surveillance and performance

Activity 9.2.3: Provide feedback on surveillance and performance data to Provinces and Districts

Strategy 9.3: Capacity building on community surveillance for targeted VPDs by 2020

Activity 9.3.1: Scale-up surveillance scope at the HF level, through training of service providers in standard surveillance methods and forms

Activity 9.3.2: Train HWs on community sensitization on community surveillance

Strategy 9.4: Monitoring and reporting AEFI

Activity 9.4.1: Integrate AEFI surveillance with disease surveillance

Activity 9.4.2: Provide appropriate AEFI data tools

Activity 9.4.3: Training HWs

Activity 9.4.4: Conduct regular monitoring and reporting of AEFI

Activity 9.4.5: Conduct Bi-annual meetings on AEFI with participation of the key stakeholders at State and National levels

Strategy 9.5: Development and implementation of the outbreak preparedness and response systems

Activity 9.5.1: Establishment of the Outbreak Preparedness & Response Committees at all levels

Activity 9.5.2: Conduct regular meetings of OPR Committees

Activity 9.5.3: Preposition emergency drugs & supplies

Activity 9.5.4: Ensure adequate funding and logistics for preparedness and prompt response to disease outbreaks

Activity 9.5.5: Conduct outbreak investigation for reported cases

Strategy 9.6: Implementation of the data collection systems at all levels

Activity 9.6.1: Provide appropriate data capturing tools and equipment at District and health facility levels

Activity 9.6.2: Provide training health workers on application of the HMIS tools

Activity 9.6.3: Conduct regular supportive supervision so that each HF is visited at least 6-monthly

Activity 9.6.4: Conduct advocacy to community leaders, religious leaders on data ownership and use of data for action

Activity 9.6.5: Develop community data tools

Activity 9.6.6: Redefine denominator using Birth registration system

Activity 9.6.7: Provide regular feedback to districts, provinces and partners

Strategy 9.7: Implementation of the data quality assessment system in all provinces by 2018

Activity 9.7.1: Conduct quarterly DQA at all levels

Activity 9.7.2: Establish integrated data management teams at the Province, district and health facility levels

Activity 9.7.3: Conduct regular meetings of data management teams

Activity 9.7.4: Conduct national data survey on RI on a regular basis

Activity 9.7.5: Train and retrain data officers in data validation

Human Resource Management

SO10: To build capacity of frontline heath workers and EPI managers at all levels and ensure availability of adequate human resources in accordance with the minimum volume of EPI/MCH services by 2020

The objective of the immunization system component is to ensure availability of qualified and motivated EPI staff at levels, as well as service provider staff at the service delivery points.

It means that by 2020:

- Sufficient number of staff will be available in at least in 90% of health facilities;
- Highly motivated and skilled service provider staff will be available in at least 90% of health facilities across the country;

Strategies and activities to achieve the component objective are as follows:

Strategy 10.1: Improve motivation of front line service providers for integrated service provision

Activity 10.1.1: Develop performance based management system (annual reviews, rewards/promotions, sanctions)

Activity 10.1.2: Implement the developed performance based management system

Strategy 10.2: Implement of the ”health workforce enhancement plan” of NDoH Revise “health workforce “enhancement plan” to determine current HR gaps by disposition and cadre

Activity 10.2.1: Determine HR optimization strategy

Activity 10.2.2: Redistribute health care workers to areas of low staff availability

Activity 10.2.3: Recruit Health workers to fill identified HR gaps

Costing and Financing and Resource Mobilization

SO11: To ensure sustainable, adequate and timely release of funds at all levels of government by 2020

The objective of the immunization system component is to participation of EPI in budgeting processes and pro-active communication with national and provincial level key policy- and decision-makers in order to advocate for sufficient budget allocations for national immunization program, as well as for and timely release of funds for meeting costs of national immunization program implementation at central and provincial level.

It means that by 2020:

- Annual funding request for EPI is prepared and submitted to the relevant authorities;
- Annual revision of the cMYP is regularly carried out;
- EPI leadership identifies and uses key stakeholder forums for increase budgetary allocation and timely release of funds;

Strategies and activities to achieve the component objective are as follows:

Strategy 11.1: Advocacy to relevant ministries and department for adequate budgeting and timely release of funds

Activity 11.1.1: Advocate to all ministries and departments involved in the budget development process for adequate budgeting and timely release of funds

Activity 11.1.2: Advocate to Provincial authorities for adequate budgeting and timely release of funds to reduce funding gap for in immunization financing

Strategy 11.2: Secure financing for traditional and new vaccines & devices

Activity 11.2.1: Perform Advocacy for the application of the National health bill at all levels

Activity 11.2.2: Prepare and submit annual request for funding of traditional vaccines and injection supplies

Activity 11.2.3: Prepare and submit request for co-financing of new- vaccines

Strategy 11.3: Increase budgetary support for RI at all levels

Activity 11.3.1: Identify and use key stakeholder forums for increase budgetary allocation and tim`ely release of funds

Activity 11.3.2: Tracking of budget by higher levels of government

Program Management

SO12: EPI management improvement at all levels through application of the evidence-based planning and implementation of RI activities through a robust M & E process by 2020

It means that by 2020:

- Integrated EPI annual plans and M&E frameworks are developed and consistent with the National Health Plan 2011-2010

- One implementation annual progress report is produced and discussed with key stakeholders every year
- The cMYP is updated regularly reflecting either changes in the context (epidemiological, vaccine availability, etc.), resource availability or immunization system outcomes (achievements)
- At least 2 meetings demonstrating contribution of EPI partners to the decision-making are held every year
- 95% of managerial and technical positions are staffed with qualified human resource

Strategy 12.1: Institutionalize a comprehensive M & E system

Activity 12.1.1: Monitor immunization coverage monthly, sending feedback report to provinces and districts

Activity 12.1.2: Monitor and verify vaccine stock distribution

Activity 12.1.3: Monitor overall impact of RI on morbidity and mortality rates of under 5 children

Strategy 12.2: Strengthening Partnership

Activity 12.2.1: review protocols for engagement of partners for providing RI services (e.g. private health institutions, organizations working on health-related issues, etc.)

Activity 12.2.2: Conduct training for HF staff of private institutions on RI services and reporting

Strategy 12.3: To incorporate the accountability framework for routine immunization in annual routine immunization operational plan at the National, Province, District and HF level

Activity 12.3.1: Develop annual operational plan for routine immunization for National, Province, district and health facility Levels

Activity 12.3.2: Develop governance structure to include all appropriate stakeholders (national, province, district and LLG, community & partners/donors)

Activity 12.3.3: Appoint a facilitator at regional & province level to organize the review meetings and document results

Activity 12.3.4: Develop budget tracking tool to monitor expenditure for Routine Immunization at the national, province, district and LLG levels

Strategy 12.4: To improve the evidence base for decision making & planning on immunization programs

Activity 12.4.1: Establish a standing inter-agency research working group

Activity 12.4.2: Conduct study on immunization

Activity 12.4.3: Conduct NDHS on RI services

Activity 12.4.4: Conduct economic evaluations (e.g. cost effectiveness analysis) of new vaccines and of strategies to improve immunization

Activity 12.4.5: Conduct annual KAP for immunization services

Activity 12.4.6: Conduct regular Communication Reviews

Strategy 12.5: Improve coordination and collaboration between RI program and all other MCH program areas

Activity 12.5.1: Establish regular joint planning meetings at national and state level

Activity 12.5.2: Conduct periodic joint monitoring missions

Activity 12.5.3: Produce joint commodities distribution plans at all levels leveraging existing logistic systems

Activity 12.5.4: Conduct joint training of health workers across all program areas

Activity 12.5.5: Include vitamin A administration during SIAs

The list of program objectives, strategies and activities is given in the

Annex 2: Timeline of the implementation. cMYP 2016 – 2020

Key activities		2016	2017	2018	2019	2020
Objective 1:	To reach coverage of immunization of more than 95% of target population at the national level and at least 95% of target population at the district level and ensure equity in immunization service delivery through reducing percentage gap in Penta3 coverage between the highest and lowest performing provinces to 40% by 2020					
Strategy 1.1:	**To achieve > 95% Pent3 coverage among immunization target groups in at least 90% of the Provinces/Districts and LLGs by 2020 through effective implementation of SIREP and SIREP+ Programs**					
1.1.1:	Develop a list of high risk communities and collaborate with local authorities for household registration for immunization and other health services					
1.1.2:	Refresher training on immunization service delivery					
1.1.3:	Conduct supportive supervisory visits at the operational level					
1.1.4:	Expand RI service delivery services to all HFs by 2020					
1.1.5:	Organize trainings and workshops for HWs and EPI staff in micro planning at the Provinces/Districts/LLGs					
1.1.6:	Planning and implementation of Supplementary Immunization Activities in the low performing districts and among the high risk population groups					
Strategy 1.2:	**To reduce the percentage gap in Penta3 coverage between highest and lowest performing provinces to 30% by 2020**					
1.2.1:	Develop the micro-plans for low performing districts					
1.2.2:	Scale up outreach and mobile sessions to reach the hard-to-reach communities at least four (4) times a year					
1.2.3:	Increase immunization services (fixed and outreaches) in the hard-to-reach communities					
1.2.4:	Increase frequency of routine immunization sessions in urban facilities					
1.2.5:	Conduct supportive supervision and monitoring of RI (fixed and outreach sessions)					
1.2.6:	Planning and implementation of the SIAs in the low performing districts					
Objective 2:	To sustain polio free status					
Strategy 2.1:	**Increase coverage with polio vaccine through RI to 95% by 2020**					
2.1.1:	Increase RI sessions (fixed and outreach) in identified polio high risk Districts/LLGs					
2.1.2:	Conduct Planned 'Polio End Game' Activities (mop up operations)					
Strategy 2.2:	**Switch from tOPV to bOPV in the National schedule**					
2.2.1:	Implement preparatory activities (advocacy, sensitization, training, cold chain assessment)					
2.2.2:	Implement the national polio switch plan to switch from tOPV to bOPV					
Objective 3:	To eliminate Maternal-neonatal tetanus by 2020					
Strategy 3.1:	**Improved RI coverage with TT**					
3.1.1:	Conduct TT SIAs in 2018 and 2020					
Strategy 3.2:	**Accelerated TT outreach in high risk areas**					
3.2.1:	Use existing community mob/linkage activities to effectively target pregnant women					
Strategy 3.3:	**Increase ratio of clean deliveries**					
3.3.1:	Accelerate outreach for TT vaccination of CBAW in identified MNT high risk provinces and districts					
3.3.2:	Produce and disseminate IEC materials on TT importance /vaccinations					
3.3.3:	Capacity building (Train, retrain, equip) of health workers and VHVs on clean delivery practices					

Key activities	2016	2017	2018	2019	2020
Objective 4: To eliminate measles by 2020					
Strategy 4.1: To reduce measles morbidity by 90% and mortality by 95% by 2020					
4.1.1: Activities 1.1.1. – 1.1.5.					
4.1.2: Conduct MR SIAs in 2018 and 2020					
Objective 5: Hepatitis B control					
Strategy 5.1: See strategy 1.1.					
5.1.1: Activities 1.1.1. – 1.1.5.					
Objective 6: Introduce HPV vaccine in national Routine Immunization Schedule and achieve 95% coverage of HPV (for 9-14-years old girls) by 2020					
Strategy 6.1: Implementation of the SIREP Plus Strategy					
6.1.1: Develop the basic guide and manual for HPV Vaccine delivery					
6.1.2: Get stakeholder consensus on the guide and manual					
6.1.3: Finalize guide and manual					
6.1.4: Develop a micro-plan for HPV introduction					
6.1.5: Conduct HPV Demo project					
6.1.6: Analyse results of the DEMO project and document the lessons learnt					
6.1.7: Introduce HPV into RI schedule					
6.1.8: Conduct HPV vaccine post introduction evaluation					
6.1.9: Document lessons learnt					
Objective 2: Increase awareness and generate demand for immunization through effective coordination and collaboration among the communities and key stakeholders in NIP implementation as measured by decreased DTP1-DTP3 dropout rate					
Strategy 2.1: Implementation of SIREP strategy to ensure the availability of an MCH/EPI integrated communication plan for routine/supplemental immunization and surveillance activities in at least 75% of the provinces by 2020					
2.1.1: Develop and institutionalize the integrated MCH/EPI communication plan through active collaboration with other PH programs					
2.1.2: Implement the integrated communication plan at all levels					
2.1.3: Train EPI staff at all levels in application the tools and materials of the integrated communication plan					
2.1.4: Produce and distribute IEC and social mobilization materials among the target population at all levels					
Strategy 2.2: Implementation of the SIREP strategy to contribute in demand generation of communities for immunization services, through increasing awareness and participation of communities in the RI implementation					
2.2.1: Design and implement Awareness Raising/ Social Mobilization campaigns targeting all major stakeholders at all levels with the special emphasis on communities					
2.2.2: Develop materials for social/community mobilization activities					

Key activities		2016	2017	2018	2019	2020
2.2.3:	Train HW in application of the social community mobilization methods and materials					
2.2.4:	Engage community health workers to mobilize caregivers to access and utilize integrated EPI/MCH services in their communities in their respective communities					
2.2.5:	Develop social mobilization plans for Health Facilities					
2.2.6:	Organize meetings with community members to ensure their participation on Awareness raising and social mobilization activities					
Strategy 2.3:	**Collaboration with Key Stakeholders**					
2.3.1:	Establish effective and regular communication channels with the key stakeholder groups at all levels for ensure their participation/contribution in implementation of the RI					
2.3.2:	Conduct regular business meetings with the key stakeholder groups to ensure their participation and contribution in the planning and implementation of the EPI					
Strategy 2.4:	**Implementation of the advocacy plan targeting key stakeholder groups with the major emphasis on advocacy among the, policy- and decision-makers at all levels**					
2.4.1:	Develop of the advocacy plan					
2.4.2:	Conduct advocacy meetings with the high level political leadership and representatives of the ministries on the roles and responsibilities of key actors in implementation of the EPI					
2.4.3:	Conduct advocacy meetings with participation of provincial authorities, political leaders at the district level, opinion makers at the HF level on the roles and responsibilities in EPI implementation					
Strategy 2.5:	**Engage Mass Media in promotion of the EPI**					
2.5.1:	Sensitize media organizations on immunization issues as corporate social responsibility to attract free/discounted space/airtime					
2.5.2:	Develop a comprehensive media plan					
2.5.3:	Develop social marketing products appropriate for the country					
2.5.4:	Distribute social marketing materials in the identified media products (digital media, print media and etc.)					
Objective 3:	Availability of the high-standard vaccine management systems ensuring regular high quality vaccine supply at all levels					
Strategy 3.1:	**Implementation EVM improvement plan**					
3.1.1:	Forecast, order and supply vaccines to all Provinces, districts and HFs					
3.1.2:	Procure additional cold chain equipment to bridge identified gaps from the EVMA, according to 5 year cold chain plan					
Strategy 3.2:	**Improve vaccine arrival procedure**					
3.2.1:	Develop and use of a standardized arrival form for consumables					
Strategy 3.3:	**Improve temperature monitoring system through putting in place a system of early detection and action for safe-keeping of vaccines**					
3.3.1:	Place functional temperature recorders in all cold rooms					
3.3.2:	Map temperature of all cold and freezer rooms					
3.3.3:	Review monthly and keep temperature records at all levels.					
Strategy 3.4:	**Enhance the cold-chain maintenance system**					
3.4.1:	Develop and institutionalize preventive maintenance plans at all levels of the cold chain					

Key activities	2016	2017	2018	2019	2020
Strategy 3.5: Improve stock management practices					
3.5.1: Implement live computerized stocks management system					
3.5.2: Training of the cold-chain technicians in application of the stock management system tools					
Strategy 3.6: Improve distribution of vaccines at all levels					
3.6.1: Application of the push system for vaccines and devices at all levels tied to the coverage (quarterly from national to zones and states, monthly from LGA to HF)					
Strategy 3.7: Improve distribution of vaccines at all levels					
3.7.1: Train health workers on vaccine forecast, stock management, vaccine wastage management, monitoring and supportive supervision					
3.7.2: Provide adequate revised management tools at all levels					
3.7.3: Monitor and supervise teams at the subnational levels					
3.7.4: Expand the use of incinerators at state and service delivery levels for proper immunization waste management					
Objective 4: To strengthen & sustain disease surveillance and HMIS for targeted VPDs and ensure availability of the quality data on RI at district and provincial levels with reporting rate of immunization to 95% by 2020					
Strategy 4.1: Improve disease surveillance and reporting systems					
4.1.1: Active AFP surveillance in all Provinces combined with other VPDs (MNT & measles) surveillance					
4.1.2: Training & retraining of HWs on case identification & reporting in all Health Facilities					
4.1.3: Establish data base on DSR					
4.1.4: Hold regular/quarterly meetings on AFP surveillance with the relevant stakeholders					
Strategy 4.2: Strengthen case-base and laboratory-based surveillance					
4.2.1: identify laboratories for collaboration on Polio & measles lab base surveillance					
4.2.2: Train managers and frontline health workers on data management for effective feedback on surveillance and performance					
4.2.3: Provide feedback on surveillance and performance data to Provinces and Districts					
Strategy 4.3: Capacity building on community surveillance for targeted VPDs by 2020					
4.3.1: Scale-up surveillance scope at the HF level, through training of service providers in standard surveillance methods and forms					
4.3.2: Train HWs on community sensitization on community surveillance					
Strategy 4.4: Monitoring and reporting AEFI					
4.4.1: Integrate AEFI surveillance with disease surveillance					
4.4.2: Provide appropriate AEFI data tools					
4.4.3: Training HWs					
4.4.4: Conduct regular monitoring and reporting of AEFI					
4.4.5: Conduct Bi-annual meetings on AEFI with participation of the key stakeholders at State and National levels					
Strategy 4.5: Development and implementation of the outbreak preparedness and response systems					
4.5.1: Establishment of the Outbreak Preparedness & Response Committees at all levels					
4.5.2: Conduct regular meetings of OPR Committees					

Key activities		2016	2017	2018	2019	2020
4.5.3:	Preposition emergency drugs & supplies					
4.5.4:	Ensure adequate funding and logistics for preparedness and prompt response to disease outbreaks					
4.5.5:	Conduct outbreak investigation for reported cases					
Strategy 4.6:	**Implementation of the data collection systems at all levels**					
4.6.1:	Provide appropriate data capturing tools and equipment at District and health facility levels					
4.6.2:	Provide training health workers on application of the HMIS tools					
4.6.3:	Conduct regular supportive supervision so that each HF is visited at least 6-monthly					
4.6.4:	Conduct advocacy to community leaders, religious leaders on data ownership and use of data for action					
4.6.5:	Develop community data tools					
4.6.6:	Redefine denominator using Birth registration system					
4.6.7:	Provide regular feedback to districts, provinces and partners					
Strategy 4.7:	**Implementation of the data quality assessment system in all provinces by 2018**					
4.7.1:	Conduct quarterly DQA at all levels					
4.7.2:	Establish integrated data management teams at the Province, district and health facility levels					
4.7.3:	Conduct regular meetings of data management teams					
4.7.4:	Conduct national data survey on RI on a regular basis					
4.7.5:	Train and retrain data officers in data validation					
Objective 5:	To build capacity of frontline heath workers and EPI managers at all levels and ensure availability of adequate human resources in accordance with the minimum volume of EPI/MCH services by 2020					
Strategy 5.1:	**Building capacity of health workers for quality service delivery**					
5.1.1:	Provide Integrated service provision Management Training for frontline health workers					
5.1.2:	Provide MLM training for EPI managers					
5.1.3:	Provide cold chain/vaccine management training for cold chain staff					
5.1.4:	Ensure Utilization on-the-job training methods such as Mentorship, and supportive supervision					
Strategy 5.2:	**Improve motivation of front line service providers for integrated service provision**					
5.2.1:	Develop performance based management system (annual reviews, rewards/promotions, sanctions)					
5.2.2:	Implement the developed performance based management system					
Strategy 5.3:	**Implement of the" health workforce enhancement plan" of NDoH**					
5.3.1:	Revise "health workforce "enhancement plan" to determine current HR gaps by disposition of staff					
5.3.2:	Determine HR optimization strategy					
5.3.3:	Redistribute health care workers to areas of low staff availability					
5.3.4:	Recruit Health workers to fill identified HR gaps					

Key activities	2016	2017	2018	2019	2020
Objective 6: To ensure sustainable, adequate and timely release of funds at all levels of government by 2020					
Strategy 6.1: Advocacy to relevant ministries and department for adequate budgeting and timely release of funds					
6.1.1: Advocate to all ministries and departments involved in the budget development process for adequate budgeting and timely release of funds					
6.1.2: Advocate to Provincial authorities for adequate budgeting and timely release of funds to reduce funding gap for in immunization financing					
Strategy 6.2: Secure financing for traditional and new vaccines & devices					
6.2.1: Perform Advocacy for the application of the National health bill at all levels					
6.2.2: Prepare and submit annual request for funding of traditional vaccines and injection supplies					
6.2.3: Prepare and submit request for co-financing of new- vaccines					
Strategy 6.3: Increase budgetary support for RI at all levels					
6.3.1: Identify and use key stakeholder forums for increase budgetary allocation and timely release of funds					
6.3.2: Tracking of budget by higher levels of government					
Objective 7: EPI management improvement at all levels through application of the evidence-based planning and implementation of RI activities through a robust M & E process by 2020					
Strategy 7.1: Institutionalize a comprehensive M & E system					
7.1.1: Monitor immunization coverage monthly, sending feedback report to provinces and districts					
7.1.2: Monitor and verify vaccine stock distribution					
7.1.3: Monitor overall impact of RI on morbidity and mortality rates of under 5 children					
Strategy 7.2: Strengthening Partnership					
7.2.1: review protocols for engagement of partners for providing RI services (e.g. private health institutions, organizations working on health-related issues, etc.)					
7.2.2: Conduct training for HF staff of private institutions on RI services and reporting					
Strategy 7.3: To incorporate the accountability framework for routine immunization in annual routine immunization operational plan at the National, Province, District and HF level					
7.3.1: Develop annual operational plan for routine immunization for National, Province, district and health facility Levels					
7.3.2: Develop governance structure to include all appropriate stakeholders (national, province, district and LLG, community & partners/donors)					
7.3.3: Appoint a facilitator at regional & province level to organize the review meetings and document results					
7.3.4: Develop budget tracking tool to monitor expenditure for Routine Immunization at the national, province, district and LLG levels					
Strategy 7.4: To improve the evidence base for decision making & planning on immunization programs					
7.4.1: Establish a standing inter-agency research working group					
7.4.2: Conduct study on immunization					
7.4.3: Conduct NDHS on RI services					
7.4.4: Conduct economic evaluations (e.g. cost effectiveness analysis) of new vaccines and of strategies to improve immunization					
7.4.5: Conduct annual KAP for immunization services					
7.4.6: Conduct regular Communication Reviews					

Key activities		2016	2017	2018	2019	2020
Strategy 7.5: Improve coordination and collaboration between RI program and all other MCH program areas						
7.5.1:	Establish regular joint planning meetings at national and state level					
7.5.2:	Conduct periodic joint monitoring missions					
7.5.3:	Produce joint commodities distribution plans at all levels leveraging existing logistic systems					
7.5.4:	Conduct joint training of health workers across all program areas					
7.5.5:	Include vitamin A administration during SIAs					

of this cMYP.

The strategies and actions of National Immunization Program are aligned with the National Health Plan and will contribute in achievement of overarching goal of the National Health Plan "strengthened primary health care for all, and improved service delivery for the rural majority and urban disadvantaged".

cMYP 2016-2020 reflects key strategic decisions made the EPI PNG to strengthen Routine Immunization activities with major emphasis on the outreach and mobile service provision and implement Supplemental Immunization Activities (SIAs) only in exceptional cases for addressing major challenges and immunization needs of the high risk groups of the PNG population.

Over the cMYP cycle, EPI PNG will be focusing on the improvement of immunization system components which will eventually lead to the achievement of the program specific objectives and goals.

Service delivery

During the period 2016-2020 EPI through analysis of the HMIS data will identify high-risk districts and communities, define the reasons of sub-standard performance of the immunization program in these districts and based on this analysis will design and implementation of specific corrective interventions, including micro-plans for improving immunization service delivery. Preliminary analysis of HMIS data showed that almost a half of PNG districts was not able to reach more than 50% DTP3 coverage rate, which means that potentially specific interventions should target almost a half of immunization target population. These interventions will be implemented through SIREP and SIREP Plus strategies to accelerate immunization activities in the most unprotected part of the population. Considering pool of high-risk districts (50% of all PNG districts) it is believed that success of SIREP and SIREP Plus interventions will contribute in the overall improvement of EPI performance in country and will increase level of immunity in the whole country.

Capacity strengthening of service providers in high quality service delivery will be one of the most important component of SIREP and SIREP Plus interventions. This will be carried out through assessment of capacity strengthening needs of service providers, development of training materials and delivery of trainings to the providers. In addition, EPI will be focusing on the capacity building of the mid-level managers and front line service in application of best management practices, through implementation of series of training sessions in micro-planning and best practices of service delivery. Strengthening of supportive supervision capacity and practices will be another key priority, especially at the district and provincial levels, which hopefully will contribute in increased quality of provided services, improved cold-chain management practices, reporting and surveillance.

Improvement of EPI performance in hard-to-reach districts and communities will be one of the main concern of EPI over the course of this cMYP cycle. Through implementation of SIREP Plus strategy EPI will accelerate routine immunization service delivery through outreach and mobile sites and application of micro-plans that are custom-tailored to the existing context of each targeted district.

At the same time, EPI will employ strategies for improvement of fixed site service delivery through the health centers and other medical facilities. This might be done through fine-tuning of facility operations, increasing frequency of vaccination sessions and improving overall management practices including capacity strengthening of HF staff in micro-planning, RI service provision monitoring, surveillance and reporting.

Over the course of the next five-year period high priority will be given to the improvement of communication between the EPI and key stakeholders at all levels, with major emphasis on communities. This will be achieved through design and implementation of the communication and demand generation plans, as well as implementation of awareness raising and social mobilization strategies for ensuring active participation of communities in promotion and advocacy of immunization services.

Overall improvement of service delivery practices will also be a key factor for advancing towards achievement of program objectives related to the acceleration of the VPD control initiatives such as MNTE, measles and rubella elimination and Hepatitis B control.

In addition to the overall efforts towards improvement of service delivery component of immunization system EPI will implement complex of specific activities aiming at achievement MNT elimination and ensuring sustainability of country's polio free status.

More specifically EPI will promote clean deliveries through development and dissemination of IEC materials among the community groups and train service providers in the best practices of clean delivery which will eventually contribute in increased ratio of clean deliveries in the PNG communities.

In 2016 EPI will implement National Polio Switch Plan for contributing in sustaining of polio free status of PNG. The National Polio Switch Plan will be implemented within the framework of Global Polio Eradication End Game Strategy.

The findings of mid-term evaluation of National Health Plan which were related to the immunization component of the NHP and particularly impact of the SIAs on the overall performance of National Immunization Program (see 1.4.1. Routine immunization) were intensively discussed by the EPI leadership. The main purpose of these discussions was to analyze determinants of current performance and sub-standard achievements of the EPI in reaching immunization coverage targets and to identify the most effective and feasible strategies for improving overall performance of EPI in country.

In result of discussion, the EPI leadership made strategic decision to opt for the strengthening of Routine Immunization service delivery through implementation of SIREP and SIREP Plus strategies and minimize utilization of Supplemental Immunization Activities (SIAs) due to the high costs of SIAs and undesirable impact of Supplemental Immunization Activities on overall performance and sustainability of Routine Immunization program. However, considering the existing critical problems in some areas of the country (high risk groups, hard-to-reach districts) and consequences of the recent measles outbreak (2014) EPI decided to plan and implement two limited-scale MR and TT SIAs in 2018 and 2020. These SIAs will target children under 15 years of age and childbearing age women in the low performing/high risk districts of PNG. Implementation of these SIAs are considered as the necessary measure for protection of the high risk groups, prevention of outbreaks and increase of the overall immunity level in the country.

Introduction of the new vaccines in national immunization schedule is one of the global goals of the GVAP and the Western Pacific Region for Immunization. Considering high global and regional priority given to this subject, new vaccine introduction has always been on the agenda of EPI PNG.

Priorities of this cMYP were defined through intensive consultation of key EPI stakeholders for prioritization of the key areas and major challenges faced by the EPI during recent years. During the consultation process EPI analyzed several important factors such as: sub-standard performance of immunization system in achieving program objectives, existing weaknesses of the immunization system related to almost all system components, including service delivery and vaccine management

components, limited human resource capacity combined with the limited management capacity of the existing program personnel and finally limited and/or unpredictable financial resources that was expected to be available during the cMYP cycle. In this light, the EPI discussed feasibility of Rotavirus vaccine introduction, which have been of the priority topics on EPI agenda during the recent years. However, considering all existing factors and most burning needs for improvement of system performance, EPI made decision to postpone introduction of Rotavirus vaccine for the next cMYP period and concentrate available resource on the improvement of overall performance of EPI through focusing on improvement of immunization system components.

The only exception in terms of new vaccine introduction will be made for HPV vaccine introduction. EPI decided to roll-out HPV vaccine at the national level which will be the logical continuation of the HPV Demo project implemented in the National Capital District among the special target group.

Detail information on the activities which will be implemented for improving service delivery component of the national immunization program is presented in the Annex 1 of this plan “Specific objectives, Strategies and Activities.

Demand Generation and Communication

The role of communities and individuals in overall performance of immunization program and benefits of increased awareness of communities on the value of vaccines and the rights of communities to access immunization services are important factors which should be considered during selection of strategies and defining activities of immunization program. Considering critical importance of these aspects EPI will implement complex of activities to ensure proactive participation of communities and individuals in implementation of the national immunization program in PNG.

More specifically EPI in close collaboration with other public health programs will develop a portfolio of plans to improve communication, demand generation, advocacy and media engagement in promotion of public health services and particularly immunization services among the population of PNG. With this regard, in addition to these programs, EPI will design and implement two different campaigns: awareness raising and social mobilization campaigns to ensure engagement of communities and individuals in the national immunization program implementation and promotion of vaccination among the immunization target groups.

For realization of these plans and campaigns, EPI will implement complex of capacity strengthening/educational activities among various target groups. More specifically capacity strengthening activities will target EPI staff with the major emphasis on mid-level management staff and front line service providers. These will include assessment of capacity strengthening needs of EPI personnel and service providers, development of training materials and implementation of the trainings aiming at increased quality of staff performance and service delivery at all levels.

Awareness raising and social mobilization campaigns will be designed and implemented in close collaboration with the public health programs to contribute in development of integrated MCH/EPI service provision model and engagement of population groups and especially community leaders and opinion makers in promotion of the available public health services, that hopefully will further contribute in overall improvement of health status of the population of the country.

Taking into account the existing strong opinion-making potential of mass media, EPI will be specially focused on engagement of mass media representatives and groups in promotion of immunization among the population of PNG. For this purpose, EPI will develop a special mass-media

engagement plan and will contribute in development of promotional materials to ensure effectiveness in social marketing of immunization services.

Vaccine Security, Cold Chain and Logistics Management

Vaccine supply chain has been considered as one of the most problematic components of the national immunization program of PNG. EVM assessment implemented in 2011 provided key recommendations for improving all components of vaccine management practices and overall performance of the vaccine supply chain. However, not much work has been done for implementation of the EVM assessment improvement plan. The next EVM assessment will be implemented in 2016. It is expected that the new assessment will provide updated information on the status of all components of vaccine supply chain and existing vaccine management practices. One of the key benefits of EVM assessment is improvement plan which can be regarded as “prescription for treatment” of all components of the vaccine supply chain of the country including: vaccine procurement, logistics systems, cold-chain management and maintenance, storage and stock management. Upon completion of the EVM Assessment and development of Vaccine Management Improvement Plan, EPI will undertake substantial efforts for addressing existing challenges through implementation of the EVM Assessment improvement plan.

Surveillance and Reporting

Availability of the quality and reliable data is the key factor for empowering EPI management for informed decision making. The quality of surveillance systems and reliability of data retrieved through these systems has been among the major problems in PNG. During this cycle of cMYP EPI will fine-tune existing surveillance systems and establish new systems to ensure improved surveillance of VPDs and surveillance data reporting practices.

Overall EPI sets six different strategies for strengthening and sustaining disease surveillance and health management information systems for targeted VPDs. These strategies are related to the AFP surveillance, case-based and lab-based surveillance, HF capacity building for community surveillance on targeted VPC, monitoring and reporting of AEFI and development of outbreak preparedness and response systems. These strategies will be realized through implementation of specific activities including development of surveillance tools, fine-tuning monitoring and reporting procedures and processes and training of staff in application of the data management tools, monitoring and reporting practices.

A special set of activities will be implemented for development and implementation of the outbreak preparedness and response systems which will include establishment of outbreak preparedness and response committees and ensuring effective work of these committees, ensuring availability of emergency drugs and supplies and finally ensuring adequate funding and logistical support for preparedness and prompt response to disease outbreaks.

Finally, EPI will design and implement data quality assessment system and strengthen provincial capacity for data quality assessment through training of provincial level data managers.

Human resource management

The lack of sufficient health workforce across all health care facilities in the country is among the major problems faced by EPI. The detail description and nature of the problems is given in Section 1.2.4. Health Workforce of this plan. Overall improvement of the EPI performance will be impossible with available human resource capacity and therefore during this cMYP cycle EPI will undertake efforts for human resource capacity strengthening as well as strengthening technical capacity of already existing personnel.

These will be achieved through implementation of three different strategies concerned with capacity building of health workers for high quality service provision, improving motivation of front line service providers for integrated service provision and implementation of the "health workforce enhancement plan" developed by National Department of Health. The strategies will be realized through implementation of set of targeted activities that will include training of management and service provider staff, development and institutionalization of performance-based system, defining current human resource gaps at all levels and supporting NDOH in implementation of the "Health workforce enhancement plan". The EPI will identify existing HR gaps and will advocate NDOH for redistribution of existing HR to the most problematic areas and recruitment of necessary cadre for to fill identified HR gaps.

Costing financing and resource mobilization

In total three different strategies were set for ensuring effectiveness of EPI in securing sufficient funds for program implementation. These strategies will be concerned with advocacy for adequate budgeting and timely release of funds ensuring sufficient funding for vaccines, injection supplies and cold-chain equipment and increase of budgetary support at all levels, especially at the provincial level.

The strategies will be realized through implementation of the defined activities including implementation of advocacy meetings with the key policy- and decision-maker groups and proactive participation in the budget development process to ensure allocation of sufficient funding for the national immunization program.

Special emphasis in planning and implementation of advocacy activities will be paid to the provincial level, for addressing one of the most serious challenges in terms of immunization program funding at the provincial level. Currently, the provincial leaders are the only decision makers on distribution of health funds received from national level. Despite of central level decision, the provincial leaders make their own decisions to allocate and/or distribute health funds across the various fields of health sector which in some cases leads to low prioritization of national immunization program and underfunding of immunization service delivery. For addressing this challenge, EPI will plan and implement set of advocacy activities to ensure ownership of Provincial leaders in immunization program implementation and sufficient resource allocation for immunization program.

And finally, the EPI will develop capacity and institutionalize system for development and submission of annual and/or multi-year request for funding of routine immunization vaccines as well as request for funds needed for co-financing of GAVI supported vaccines.

Program management

EPI elaborated five different strategies for improvement of EPI management at all levels through application of evidence-based planning and implementation of the program.

Implementation of these strategies will help EPI in development and institutionalization of the M&E system, development and strengthening of partnerships and institutionalization of the accountability framework at all levels. The strategies will also help EPI to improve evidence-base for informed decision making and planning as well as improve collaboration between the EPI and MCH programs.

The strategies will be realized through implementation of different types of activities such as: development of the joint plans through collaboration with the partners, development of inter-agency groups, design and implementation of various studies on various topics related to the immunization; monitoring immunization coverage stock distribution and RI morbidity and mortality rates.

2.3 Alignment with the Global Goals (GVAP)

The national cMYP is aligned with most of GVAP targets. The information on alignment of cMYP specific objectives with the GVAP goals and objectives is in Annex 2 (**Error! Bookmark not defined.**) and

Annex 3 (on page 113) of this plan.

2.4 Monitoring and evaluation

The cMYP 2016 – 2020 provides a comprehensive overview of the Immunization Programme and also provides guidance to national and sub-national levels for incorporation into their annual plans. It informs national policies in setting national targets for all immunization indicators. NDoH, partners and other stakeholders will do the monitoring for the cMYP through an annual joint review. The monitoring framework will be developed with a set of relevant indicators to measure the performance of the cMYP. These indicators would be monitored and feedback would be provided to policy and programme managers. Data for measuring these indicators would be collected routinely and supplemented with periodic reviews and surveys.

The cMYP will also be monitored indirectly with data from periodic surveys carried out in the country. Surveillance systems will be monitored by the NDoH in collaboration with surveillance units of Provinces and Districts to closely monitor the post introduction activities. In 2018, a mid-term evaluation will be organized to evaluate progress and performance in the implementation of cMYP and the progress towards achieving targets and objectives set by the cMYP 2016-2020.

Final evaluation of the cMYP 2016 – 2020 will be done in 2020 in collaboration with key stakeholder and development partners. The evidence obtained through the monitoring and evaluation will help EPI in identifying the root causes of failures and under-achievements to gaps in implementation and learning lessons from best practices of high achievers so that implementation processes can be modified and corrective measures implemented, where and when required.

3 Immunization program costs and financing

3.1 Macroeconomic context and demographics

The following assumptions have been used for macroeconomic projections for cMYP costing exercise:

- GDP per capita rate was set based on WB estimates:
  - 2.9% - 4.1% GDP range of annual growth rate during 2016 – 2020 in accordance with the WB annual GDP growth rate forecast.
  - Population annual growth rate of 3.10% in accordance with the projections of NDOH PNG.
- GDP per capita (in current US$) was estimated at 2,240 in 2014 (according to the World Bank World Development Indicator database) as shown in **Error! Reference source not found.**.
- Total Health Expenditure (THE) per capita was 101 US$ in 2013 (in accordance with the WHO NHA GHED and the WB WDI database). THE per capita projections were made using the GDP per capita annual growth rate (range 2.9% - 4.1%%) as described above
- GHE as % of THE – constant value at the rate for 2013 – 81.7%.
- Inflation rate (Consumer price index) was 5.2% in 2014, up from 4.44%-4.96% in previous 3 years;

The total population was estimated at 7,275,324 in 2014 (in accordance with Census 2011 findings):

- The population growth was projected at the annual growth rate of 3.1%.
- Infant mortality rate – constant at the rate 45.7 per 1000 live birth in 2014 in accordance with the WB WDI database
- According to the NDOH 2014:
  - The number of surviving infants was 222,171 in 2014, that translates into 232,810 newborns at the infant mortality rate of 45.7 per 1,000 live births (that is 3.2% of the total population in 2014)

The number of Childbearing Age Women (CBAW) 1,767,904 in 2014, that translates into 1.14% of total population.

3.2 Current program costs and financing

3.2.1 Expenditures on immunization in the baseline year

The national immunization program expenditures in 2014 amounted to 7.75 million US$ (with shared health system costs) as shown in Figure 32 below:

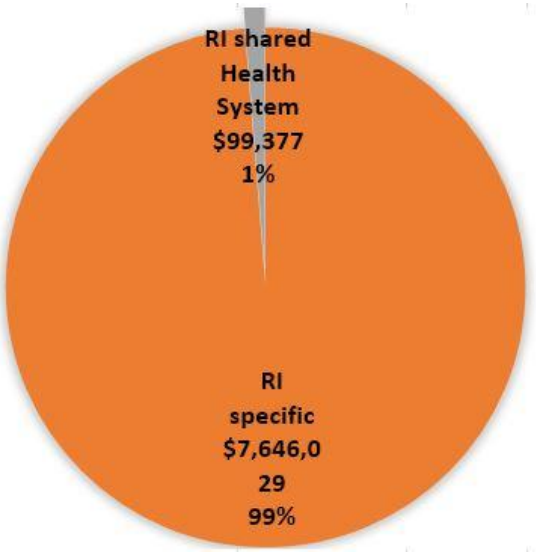
Figure 32: Baseline Indicators (2014)

Total Immunization Specific Expenditures	**$7,646,029**
Supplemental immunization activities	$0
Routine immunization only	$7,646,029
Per capita	$1.05

Per DTP3 immunized child	$56
% Vaccines and Supplies	69.9%
% Government Funding	55.2%
% Of Total Health Expenditures (THE)	1.1%
% Government Health Expenditures	1.4%
% GDP	0.0%
Total shared costs	**$99,377**
% Shared Health Systems Cost	1.3%
Total Immunization Expenditures	**$7,745,407**

No supplementary immunization activity was conducted in 2014.

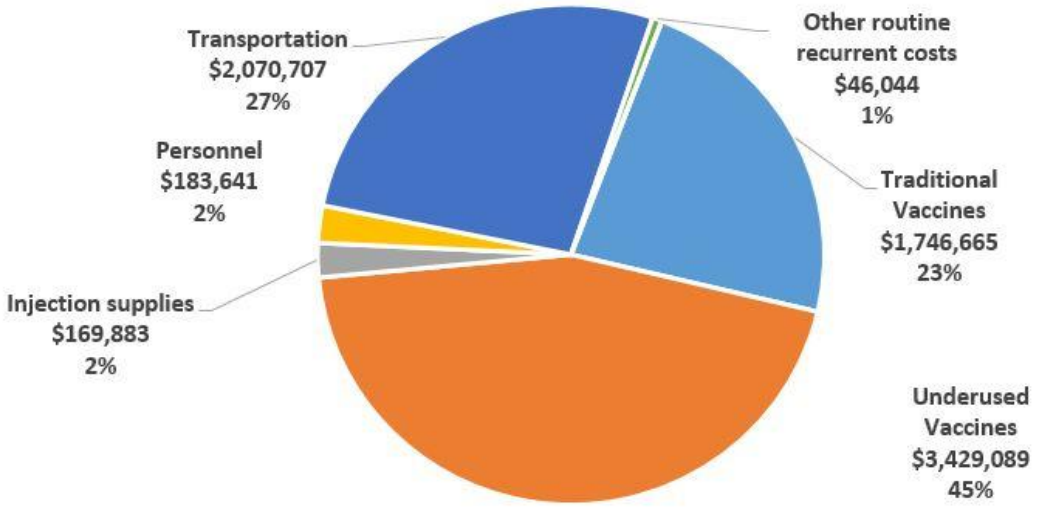
Shared health system costs (99,377 US$) accounted for one per cent of the immunization expenditures and the rest was spent specifically on routine immunization. The cost of fully (DTP3) immunized child was 56 US$.



1.1% of the total health expenditures (or 1.4% of the government health expenditure) was spent on routine immunization.

Vaccines and injection supplies were the major cost driver accounting for 69.91% (or 5.3 million US$) of all expenditures as shown in **Error! Reference source not found. Error! Reference source not found.**:

Figure 33: Routine Immunization baseline cost structure



Transportation costs were the second major cost driver accounting for 27% (or 2,070,707 US$) of the total expenditures, followed by immunization specific ("dedicated") labor costs accounting for 2.4% (183,641 US$) of the total expenditures, which was followed by "Other Routine Recurrent Costs" (1%, or 46,044 US$).

3.2.2 Routine immunization cost structure

Personnel

The majority of the total of 7,047 persons engaged in the national immunization program were shared health system personnel (allocating some portion of work time to immunization) and only 5 persons at the national level and two persons at the health facility level dedicated full work time to immunization as shown in Annex 7: Health workforce for immunization by levels and type (dedicated and shared).

Vaccines

In total 1,746,665 US$ were spent on traditional vaccines and 3,429,089 US$ - on underused vaccines in 2014; the total expenditures on vaccines and injection supplies amounted to 5,345,638 US$.

Other Routine Recurrent Costs

"Cold-chain Maintenance and overhead" accounted for 99.55% of "Other Routine Recurrent Costs" and the remaining 0.45% was spent on the "Maintenance of Other Capital Equipment". No expenditures were made for "short-term trainings", "IEC/Social Mobilization", "Disease Surveillance" and "Program Management" in baseline year.

Vehicles and Transportation

Transportation expenditures for vaccine distribution from the Central level to the provinces amounted to 2,070,707 US$ in 2014 that constituted 27% of the total recurrent expenditures on routine immunization.

The LD logistics a private transport agency is contracted by the NDOH to collect and deliver vaccines and injection supplies to provinces. Vaccines and injection supplies are distributed along with pharmaceuticals, medical supplies and other materials used for implementation other health related activities. Share of vaccines and injection supplies in all transported goods is approximately 25%. In 2014, the cost for distribution of all health related materials was 24.6 PGK[26] (or 8.28 million US$)[27]. Share for vaccine distribution accounted to 25%, or approximately 2.1 million US$.

The vaccines and supplies are distributed from Port Moresby to the Provinces mostly by air, except for those facilities that are located in Port Moresby and vaccines could be delivered by vehicles. Thus, the extremely high cost of transportation of the vaccines from the national to sub-national level could be explained with transportation difficulties and usage of the most expensive – air transport.

Transportation costs within the provinces were shared transport costs, including costs of vehicles, fuel and maintenance and allocating some portion of work time to the EPI. Shared transport costs including vehicles, fuel and maintenance accounted to 41,063 US$ in baseline year.

Fuels cost in baseline year was estimated at 1.43 U$ per liter.

No investments were made in vehicles or other transportation means in baseline year (2014).

3.2.3 Supplementary immunization costs

No SIA was conducted in 2014.

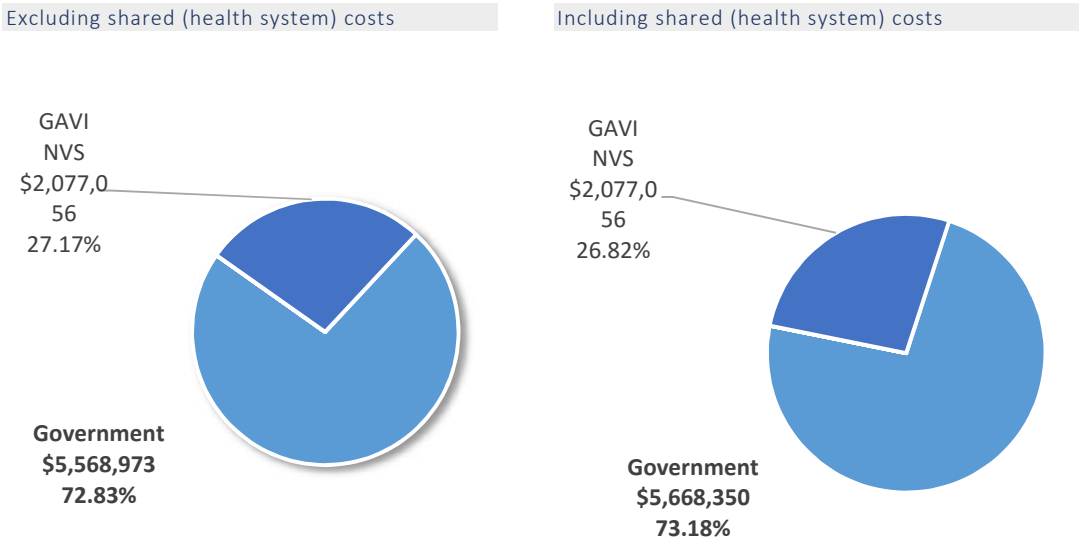
3.2.4 Immunization financing in baseline year

I The Government was the major source of financing of the national immunization program accounting for 72.83% of all funds if shared health system costs are excluded and 73.18% if shared health system costs are included as shown in Figure 34 below:

[26] 1US$ - 2.97 PGK

[27] NDOH

Figure 34: Immunization financing profile – baseline year



Gavi was the second major source of funding through NVS (2,1 million US$) accounting for 27.17% of the total funding (excluding shared costs).

3.3 Future resource requirements

3.3.1 Overview of the resource requirements' structure

The total resource requirements were estimated at 93.3 million US$ (including shared health system costs) for 2016-2020 as shown in Figure 35 below:

Figure 35: National immunization program costs summary by system components and years – basic scenario

Immunization system components	Expenditures	Future resource requirements					Total 2016 -
	2014	2016	2017	2018	2019	2020	2020
Vaccine supply and logistics (routine only)	5,391,681	9,966,191	11,370,453	16,200,021	17,017,537	15,557,058	**70,111,260**
Service delivery	2,189,147	2,189,147	2,223,985	2,223,985	2,223,985	2,223,985	**11,085,086**
Advocacy and Communication	0	102,000	104,040	106,121	108,243	110,408	**530,812**
Monitoring and disease surveillance	65,202	116,202	97,328	98,368	99,430	100,512	**511,840**
Program management	0	20,400	2,501,122	21,224	2,602,167	22,082	**5,166,994**
Supplemental immunization activities (SIA	0	0	0	2,609,789	0	2,859,305	**5,469,094**
Total immunization Immunization costs	**7,646,029**	**12,393,940**	**16,296,927**	**21,259,507**	**22,051,361**	**20,873,350**	**92,875,085**
Shared Health Systems Costs (EPI Portion)	99,377	100,199	91,745	92,599	93,471	94,360	**472,373**
otal immunization resource requirements	**7,745,407**	**12,494,138**	**16,388,672**	**21,352,107**	**22,144,832**	**20,967,710**	**93,347,458**

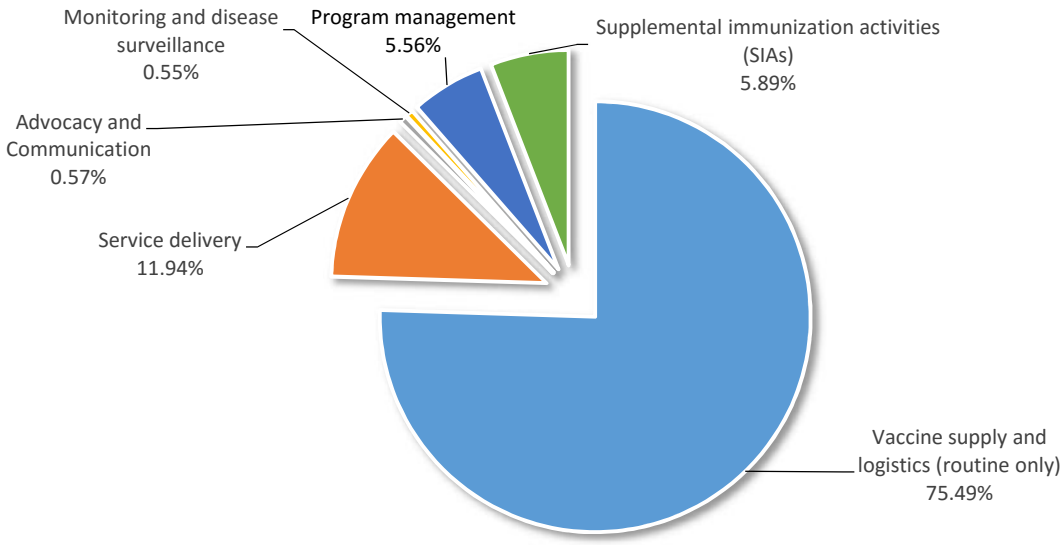
The future resource requirement detail (by cost categories) is shown in Annex 1.

3.3.2 Description of cost drivers of the future resource requirements

The resources required for "vaccine supply and logistics" account for 75.49% of the total costs for 2016-2020 (excluding shared health system costs) as shown in Figure 36 below. "Service delivery" is the 2nd major cost driver – accounting for 11.94% of the future resource requirements followed by

"SIAs" (5.89%) and "Program Management (5.56%). "Advocacy and Communication" and "Monitoring and Disease surveillance" account for 0.57% and 0.55%of total program costs respectively.

Figure 36: The future total resource requirement structure by cMYP components (shared costs excluded)

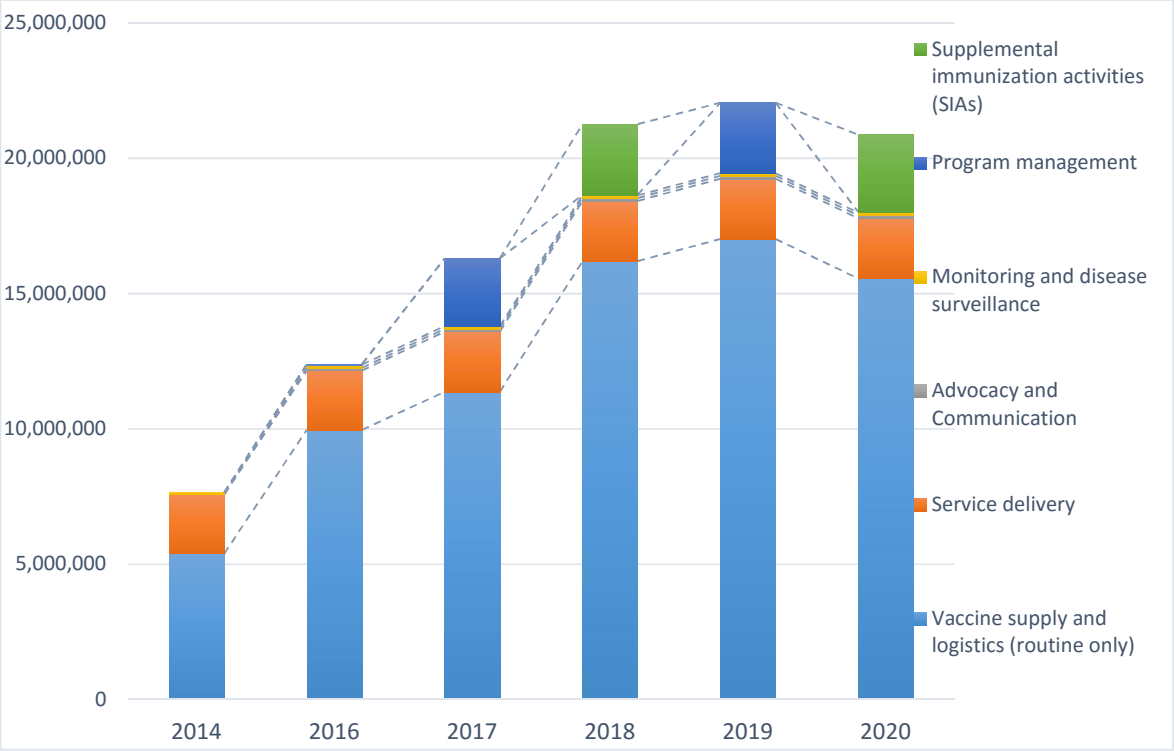


The resource requirements for routine immunization per annum varies between 9.97 and 17.01 million US$ in 2016-2020:

- The resource requirements in the first year of projection (2016) increase 4.57 million US$ (or by 84.8%) from 5.4 million US$ in the baseline year to 9.97 million US$ in 2016. This increase is caused by higher "Vaccine Supply and Logistics" related resource requirements as shown Figure 37 below.
- The resource requirements for routine immunization increase by 14%-42%-5% in next 3 years, decreases by 9% in 2020 compared to year 2019. The resource requirements for different cMYP components vary: it increases for "vaccine supply and logistics", and "SIAs" and decreases again for" vaccine supply and logistics" and "program management".

Planned two supplementary immunization activities (MR and TT campaigns) in 2018 and 2020 increase the immunization resource requirements sharply by 5.5 million US$ over the course of cMYP cycle.

Figure 37: The structure of future resourece requiements by by cMYP components and years (shared costs excluded)



Vaccines and injection supplies

The following assumptions were used for the projection of vaccine and injection supply requirements:

- Coverage rates were set in line with the objective and targets (>=95% by 2020)
- Wastage rates are estimated at 50% for BCG and at 25% for the rest of routine immunization vaccines except for HPV. Wastage rate for HPV vaccine is estimated at 5% from 2016.[28]

The present projections are based on vaccine price estimates provided by the UNICEF Supply Division and includes 11% freight costs, 4% handling costs for vaccines and 8% handling costs for injection supplies.

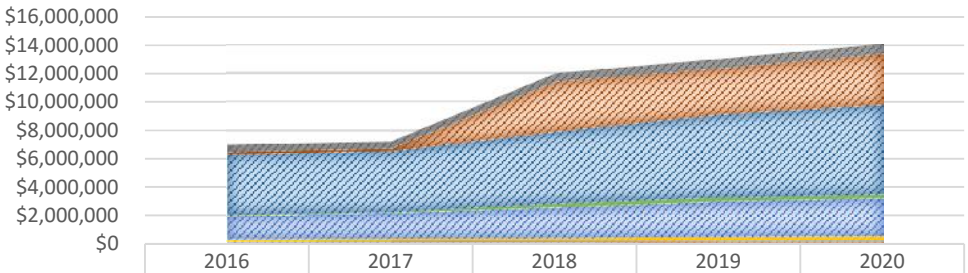
The resource requirement projections for vaccines (basic scenario) envisages:

- the cost of PCV introduced in 2014, IPV introduced in 2015, Penta introduced in 2009 with GAVI support, replacement of measles vaccine with 2 doses of MR vaccine in accordance with the new vaccination schedule.
- The cost of HPV Demo project and national wide roll-out of HPV in 2018

[28] There is no any kind of reporting form used to collect wastage data from field to comply with the use of evidence based wastage rate.

Figure 38 below illustrates that the structure of routine immunization vaccine and injection supply costs by vaccines and years.

Figure 38: Vaccine and injection supply cost projections (routine immunization).



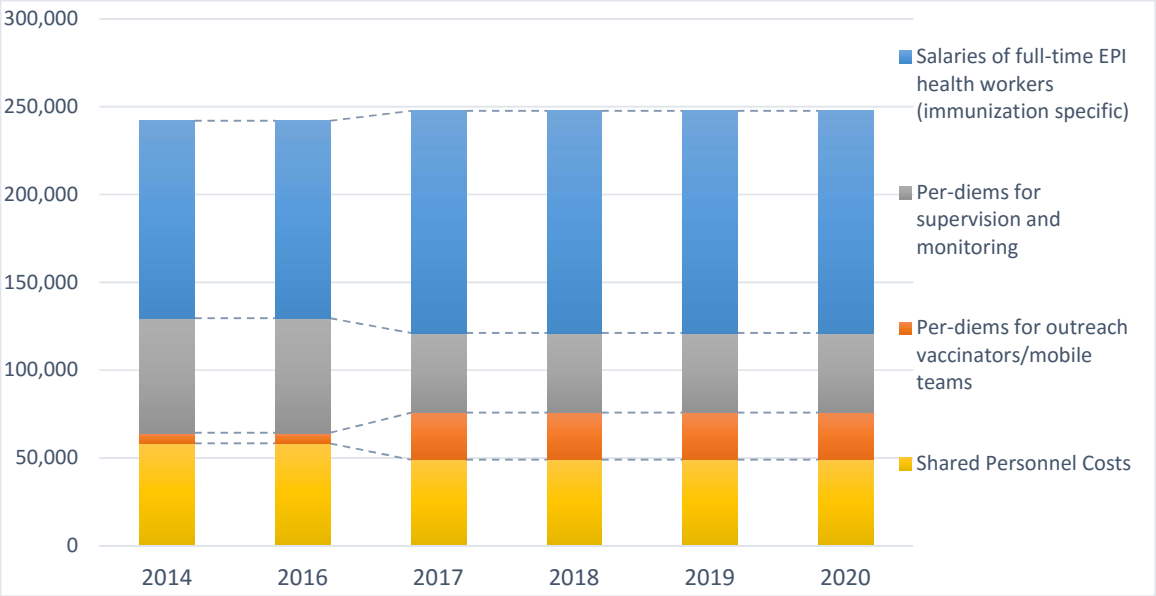
	2016	2017	2018	2019	2020
IPV	$484,834	$486,207	$570,511	$659,574	$707,960
HPV	$152,737	$153,589	$3,482,945	$3,194,495	$3,542,275
PCV13	$4,265,310	$4,284,963	$5,027,955	$5,812,894	$6,239,417
TT for pregnant women	$64,990	$77,561	$273,058	$281,212	$302,012
Penta	$1,623,030	$1,797,269	$2,144,473	$2,479,269	$2,661,238
MR	$168,021	$171,020	$200,680	$232,015	$249,066
OPV(13)	$84,295	$100,568	$118,006	$136,428	$146,436
HepB	$66,406	$68,449	$70,571	$83,985	$90,178
BCG	$55,558	$57,268	$59,043	$70,257	$75,442

The introduction HPV vaccine in 2018 increases annual resource requirement by 3.5 million US$ in 2018, 3.2 million US$ in 2019 and 3.5 million US$ in 2020 (amounting to a total of 10.2 million US$ for the projection period) as shown in Figure 39. Figure 39: Financial implication of the introduction of HPV vaccine on the NIP budget

Personnel

Personnel costs were estimated at 1.2 million US$ in 2016-2020, and salaries of the shared personnel (community health workers and health facility staff) accounted for its 25%.

Figure 40: Personnel costs by cost categories and years (routine immunization)



The personnel costs increase slightly from the baseline year (2014) reaching a plateau in 2018: the increase is determined by changing the EPI structure and modest salary increase of EPI staff and service providers as well as accelerating service delivery through the outreach and mobile sites from 2017. This effect will be offset by substantial decrease in per diems for supervision and monitoring as well as shared personnel costs during 2017-2020.

Per diems for outreach vaccination are expected to increase gradually with the acceleration of routine immunization service delivery through outreach and mobile sites, from 6,068 US$ in 2014 and 2016 to 26,829 US$ in the period 2017-2020 as shown in Annex 8: Personnel.

Supervision and monitoring related per diems is expected to decrease from 65,202 US$ in 2014 and 2016 to 45,308US$ during the period 2017-2020 per annum Annex 8: Personnel.

Cold chain equipment

EPI plans to make significant investment in cold chain capacity strengthening and upgrading cold chain equipment almost at all service delivery points across the country. Cold chain equipment will be the major cost driver accounting for 83.22% of cold chain related resource requirements.

Figure 41: Cold chain related resource requirements

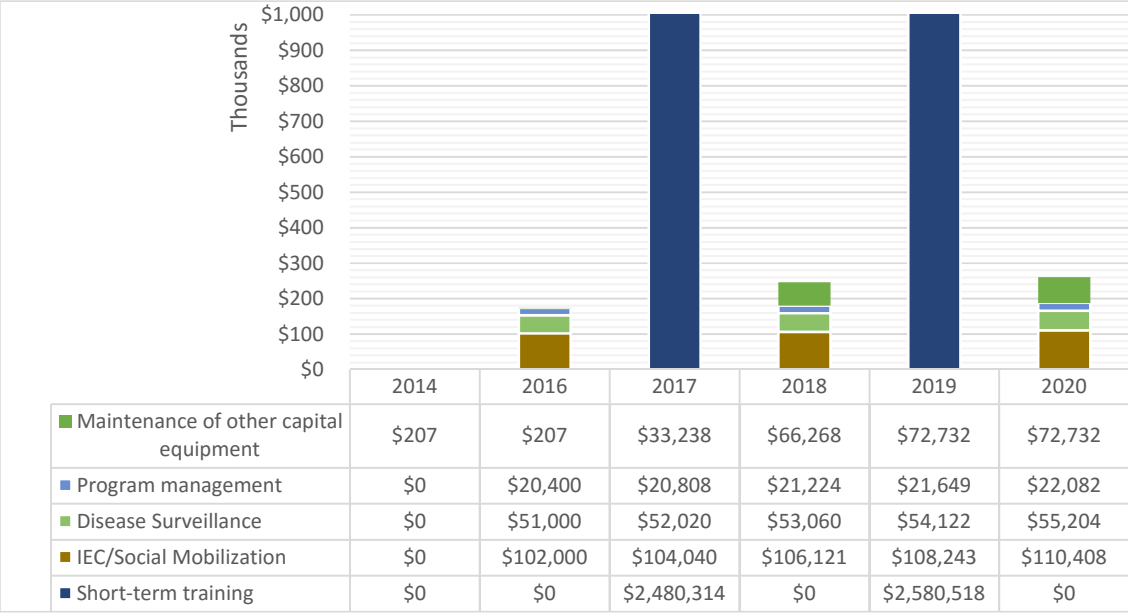
	2014	2016	2017	2018	2019	2020	Total 2016-2020
Cold chain maintenance and overhead	$45,836	$141,773	$508,240	$616,685	$671,530	$714,661	**$2,652,889**
Cold chain equipment		$2,777,395	$3,337,343	$3,257,644	$3,160,432	$621,773	**$13,154,587**
Total	**$45,836**	**$2,919,169**	**$3,845,584**	**$3,874,328**	**$3,831,962**	**$1,336,434**	**$15,807,476**

Cold chain maintenance and overhead costs is accounting for 16.78% of the 15.8 million US$ estimated to cover the cold chain related needs as shown in Figure 41 above.

Other recurrent costs

Out of the total 6.2 million US$ required for "Routine Recurrent Costs", 81.51% or US$ 5.1 million US$ will be necessary to cover "Short Term training" costs. (see Figure 42 below). Therefore, implementation of the staff capacity building activities will absorb the majority of resources.

Figure 42: The future resourc requirements for "Activities and other recurrent costs"

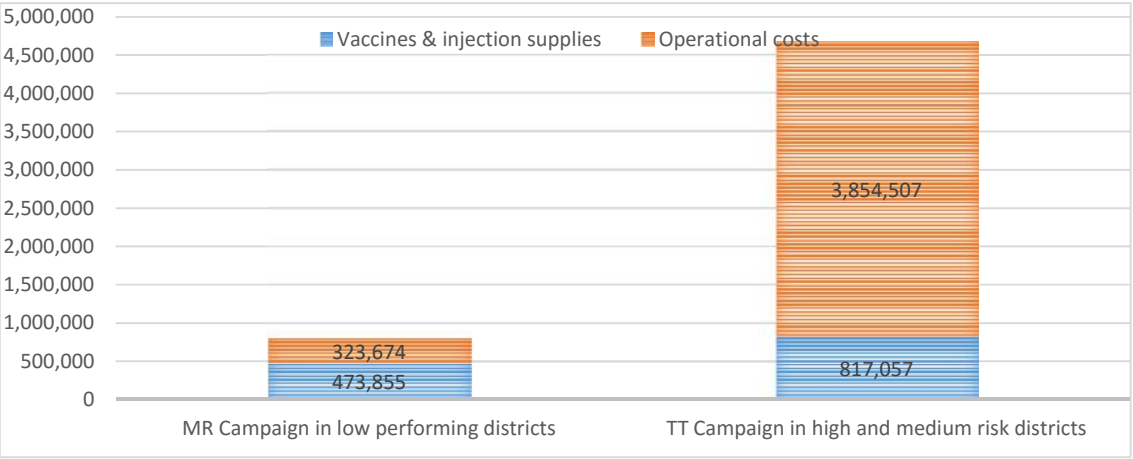


	2014	2016	2017	2018	2019	2020
Maintenance of other capital equipment	$207	$207	$33,238	$66,268	$72,732	$72,732
Program management	$0	$20,400	$20,808	$21,224	$21,649	$22,082
Disease Surveillance	$0	$51,000	$52,020	$53,060	$54,122	$55,204
IEC/Social Mobilization	$0	$102,000	$104,040	$106,121	$108,243	$110,408
Short-term training	$0	$0	$2,480,314	$0	$2,580,518	$0

Supplementary immunization activities

The cost of TT and MR campaigns in 2018 and in 2020 was estimated at 5.5 million US$. The structure of campaigns is shown in Figure 43 below:

Figure 43: The future resource requirements for SIAs



Operational costs of the campaigns were calculated based on historical unit costs: at 0.57 US$ per targeted individual for MR campaign and 1.69US$ per targeted women for TT campaigns.

3.4 Future financing and funding gaps

The total financing for 2016-2020 was estimated at 64.9 million US$ (including shared health system costs) or at 64.4 million US$ (excluding shared health system costs).

The government is the major source of financing: 23.6 million US$ is expected to be spent by the government (if shared health system costs are included) that constitutes 36.5% of all funding, or 23.2 million US$ (if shared health system costs are excluded), that is 36% of the total funding (as shown in Figure 44 below). Government financing details for the projection period are presented in

Annex 9: Total Resource Requirements, funding from all sources by risk types and government financing by cost categories.

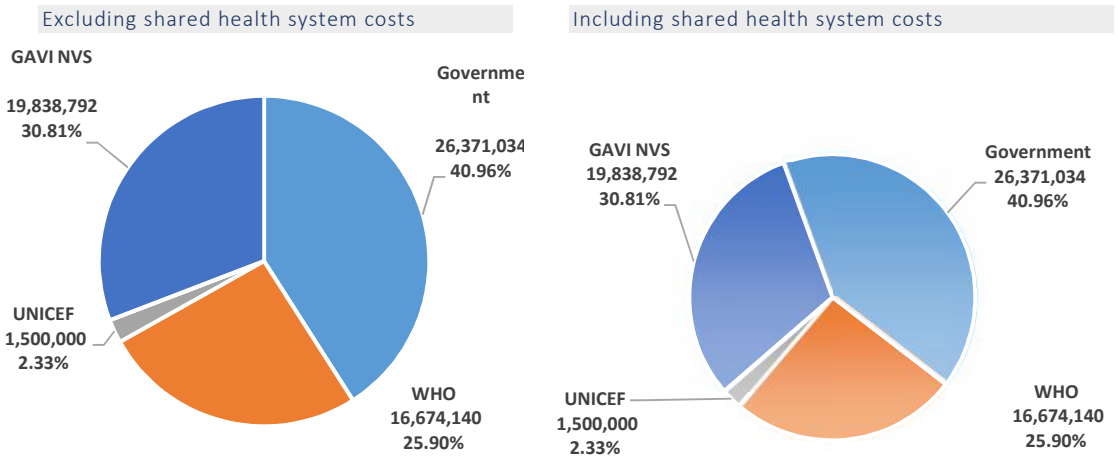
Gavi is the second major source of financing, contributing 30.81% of the total funding (without shared health system costs) or 30.59% (excluding shared health system costs).

UNICEF and WHO financing was projected as secured for 2016 and 2017. Financing from WHO for the remaining years was considered "probable". No funding is expected from UNICEF during the period 2018-2020.

71.7% (or 46.1 million US) of funding is considered to be secured out of the total immunization specific financing 64.4 million US$ as shown in Annex 10.

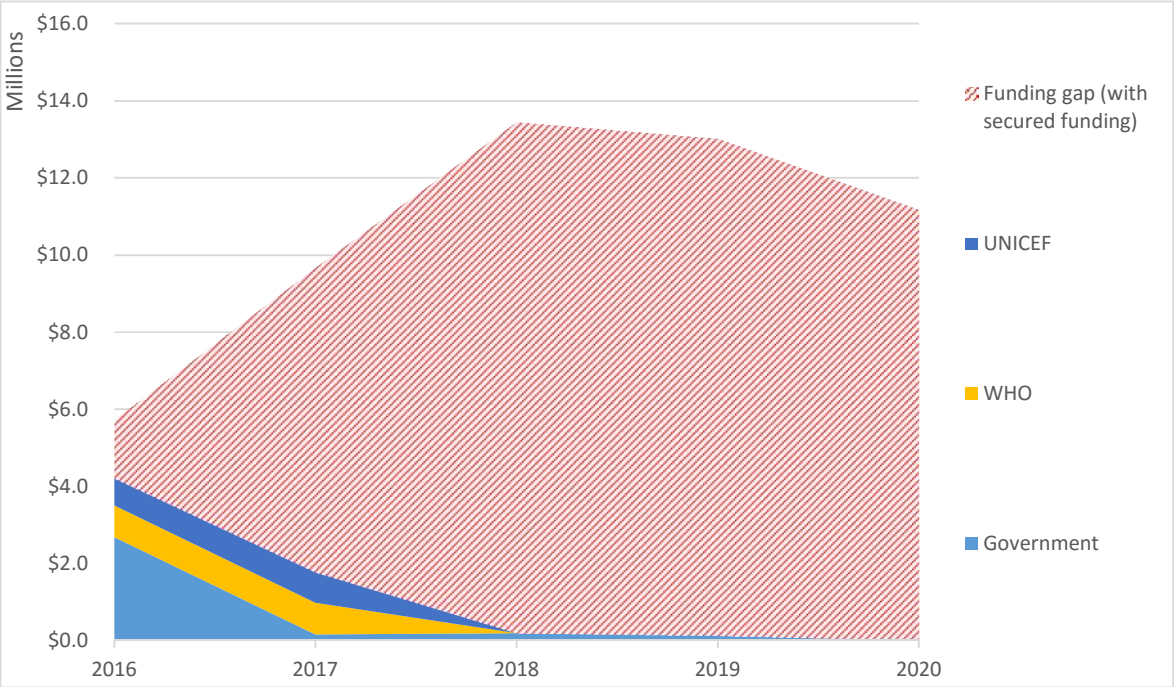
When only secured funding is considered (excluding shared health system costs), the share of government financing is 50.2% (26.4 million US$ out of total 64.4 million US secured funds); however, 17.5% of probable funding (or 3.2 million US$) is expected to come from the state budget.

Figure 44: The future financing (with secured and probable funds) structure



The secured funding is sufficient to cover only 50% of the total resource requirements in 2016-2020, so the funding gap with secured financing ranges from 12% in 2016 to 58% in 2019 and amounts to 46.7 million US$ as shown in Figure 45 on page 96.

Figure 45: Financing by sources and funding gap by years (with secured funds only)



3.5 Funding gap analysis and sustainability

The funding gap (with secured funds only) in the amount of 46.7 million US$ affects all critical components of the immunization system, meaning that if probable funds are not secured, the immunization system targets could not be achieved.

Figure 46: Funding gap (with secured financing only) structure by years

	2016	2017	2018	2019	2020	Total
With secure financing						
Vaccines & injection supplies	-2,201,993	657,636	4,241,193	4,041,088	4,451,448	**11,189,372**
Personnel	71,270	72,137	72,137	72,137	198,586	**486,266**
Transport	2,070,707	2,070,707	2,070,707	2,070,707	2,070,707	**10,353,535**
Activities and other recurrent costs	-1,201,689	1,548,352	797,090	3,508,794	975,086	**5,627,633**
Logistics (vehicles, cold chain and other equipment)	2,777,395	3,541,678	3,461,979	3,198,454	621,773	**13,601,279**
Supplemental immunization activities	0	0	2,609,789	0	2,859,305	**5,469,094**
Total funding gap	**1,515,690**	**7,890,510**	**13,252,894**	**12,891,180**	**11,176,905**	**46,727,179**

Figure 46 above shows that Logistics (vehicles, cold chain and other equipment account for 29% of the funding gap (13.6 million US$), followed vaccines and injection supplies accounting for 24% (or 11.2 million US$) of the funding gap, followed by transport - 22% (10.5 million US$), Activities and other recurrent costs and SIAs account for 12.04% (5.6 million US$) and 11.5% (5.5 million US$) respectively and personnel related funding gap accounts for 1% (or 486,266 US$).

Figure 47: Funding gap (with secured and probable financing) structure by years

	2016	2017	2018	2019	2020	Total
With secure and probable financing						
Vaccines & injection supplies	-2,201,993	153,589	3,664,978	3,370,459	3,731,254	**8,718,286**
Personnel	0	72,137	0	72,137	126,449	**270,722**
Transport	2,070,707	2,070,707	-950,167	2,070,707	-830,101	**4,431,854**
Activities and other recurrent costs	-1,201,689	1,040,112	-882,910	1,756,062	-777,645	**-66,071**
Logistics (vehicles, cold chain and other equipment)	2,777,395	3,541,678	3,461,979	3,198,454	621,773	**13,601,279**
Supplemental immunization activities	0	0	702,799	0	832,250	**1,535,049**
Total funding gap	**1,444,420**	**6,878,222**	**5,996,679**	**10,467,819**	**3,703,979**	**28,491,119**

Figure 47 presents the structure of funding gap with probable and secured financing. If probable funding is secured Logistics (vehicles, cold chain and other equipment) still remain the major driver of funding gap, accounting for 47.74% (or 13.6 million US$). This will be followed by vaccines and injection supplies - 30.6% (or 8.7 million US$), transport – 15.56% (4.4 million US$), SIAs - 5.39% (or 1.5 million US$) and personnel accounting for 0.95% (or 270,722 US$).

Figure 48: Funding gap (with secured funds only) structure by the major cost categories

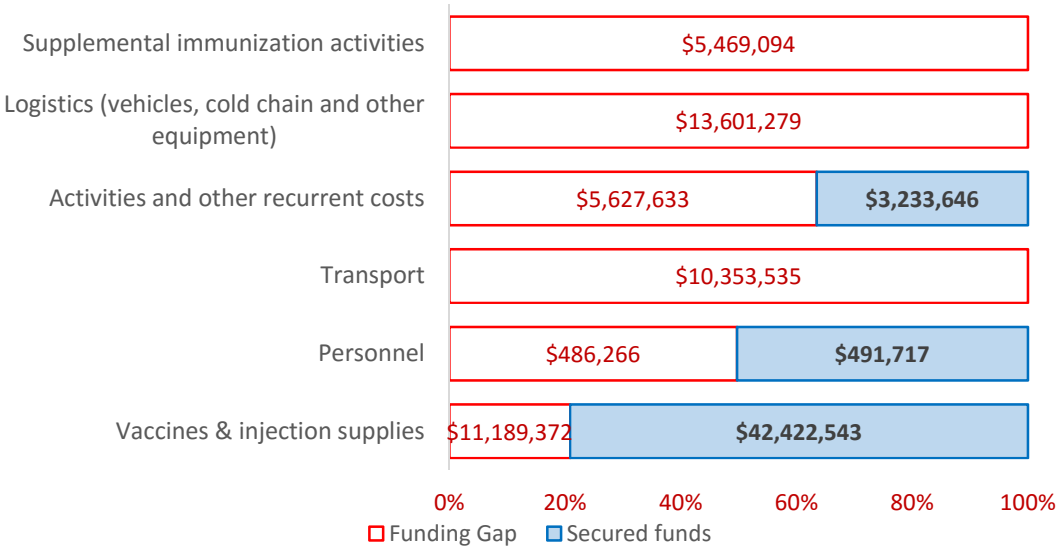


Figure 48 above shows that if funding is not secured the gap between resource requirements and available funding for SAIs, Logistics and Transport accounts 100%, for vaccines and injection supplies - 20.1%, for other recurrent costs - 63.51% and for personnel - 49.72%.

The funding gap is caused by a combination of several factors:

- Decreased of external financing – This explains "SIA" related gap, as well as the funding gap related to "activities and other recurrent costs" that has been traditionally funded by the external donors.
- Introduction of relatively expensive HPV vaccine in 2018.
- Extremely high cost of distribution of vaccines and injection supplies from the national level to provinces and districts carried out by the contracted transportation company.

- Weaknesses of the vaccine management system and particularly lack of the systems for calculating and reporting vaccine wastage rates.

3.5.1 Financial sustainability strategies

The main strategy to ensure financial sustainability of the National Immunization Program during the period 2016—2020 will be directed towards increasing reliability of financing from the domestic sources and optimization and/or minimization of costs related to the main drivers of existing financing gap. This could include following:

1. Advocate for increase of funding and timely release of funds for implementation of national immunization program at all levels;
2. Strengthen routine immunization activities through SIREP and SIREP Plus strategies to increase effectiveness of the fixed, outreach and mobile site service delivery;
3. Conduct HPV vaccine cost effectiveness study and define the most cost effective scenario for vaccine introduction;
4. Analyze vaccine wastage to improve vaccine forecast practices for reducing vaccine wastage.

4 Annexes

Annex 1: Future resource requirements (by cost categories)

Cost category		Future Resource Requirements					
	2014	2016	2017	2018	2019	2020	Total 2016-2020
Routine recurrent costs							
Vaccines (routine vaccines only)	**5,175,754**	**6,870,503**	**7,087,689**	**11,691,784**	**12,680,597**	**13,722,332**	**52,052,905**
Traditional	1,746,665	273,796	307,057	453,389	506,885	544,070	**2,085,198**
Underused	3,429,089	5,961,328	6,143,454	7,243,385	8,374,159	8,988,485	**36,710,811**
New		635,378	637,179	3,995,009	3,799,553	4,189,777	**13,256,897**
Injection supplies	169,883	176,312	199,608	363,306	394,223	425,561	**1,559,010**
Personnel	**183,641**	**183,641**	**198,586**	**198,586**	**198,586**	**198,586**	**977,984**
Salaries of full-time EPI health workers (immunization specific)	112,371	112,371	126,449	126,449	126,449	126,449	**618,166**
Per-diems for outreach vaccinators/mobile teams	6,068	6,068	26,829	26,829	26,829	26,829	**113,384**
Per-diems for supervision and monitoring	65,202	65,202	45,308	45,308	45,308	45,308	**246,433**
Transportation	**2,070,707**	**2,070,707**	**2,070,707**	**2,070,707**	**2,070,707**	**2,070,707**	**10,353,535**
Fixed Site Strategy (Incl. Vaccine Distribution)	2,070,707	2,070,707	2,070,707	2,070,707	2,070,707	2,070,707	**10,353,535**
Outreach strategy							
Mobile strategy							
Maintenance and overhead	**46,044**	**141,981**	**541,478**	**682,953**	**744,262**	**787,393**	**2,898,066**
Cold chain maintenance and overhead	45,836	141,773	508,240	616,685	671,530	714,661	**2,652,889**
Maintenance of other capital equipment	207	207	33,238	66,268	72,732	72,732	**245,177**
Building Overheads (Electricity, Water…)							
Short-term training			2,480,314		2,580,518		**5,060,832**
IEC/Social Mobilization		102,000	104,040	106,121	108,243	110,408	**530,812**
Disease Surveillance		51,000	52,020	53,060	54,122	55,204	**265,406**
Program management		20,400	20,808	21,224	21,649	22,082	**106,162**
Other routine recurrent costs							

Subtotal	7,646,029	9,616,544	12,755,249	15,187,741	18,852,907	17,392,272	**73,804,712**
Routine capital costs							
Vehicles (100% EPI)							
Cold chain equipment		2,777,395	3,337,343	3,257,644	3,160,432	621,773	**13,154,587**
Other capital equipment			204,335	204,335	38,023		**446,692**
Buildings Construction (100% EPI)							
Subtotal		2,777,395	3,541,678	3,461,978	3,198,454	621,773	**13,601,279**
Supplemental immunization activities (SIAs)							
MR Campaign in low performing districts				383,395		414,134	**797,530**
Vaccines & injection supplies				229,697		244,159	**473,855**
Operational costs				153,698		169,976	**323,674**
TT Campaign in high and medium risk districts				2,226,394		2,445,171	**4,671,564**
Vaccines & injection supplies				396,060		420,997	**817,057**
Operational costs				1,830,333		2,024,174	**3,854,507**
Subtotal				**2,609,789**		2,859,305	**5,469,094**
Shared Health Systems Costs (EPI Portion)							
Shared Personnel Costs	58,314	58,314	49,023	49,023	49,023	49,023	**254,406**
Shared Transport Costs – Vehicles, Fuel and Maintenance	41,063	41,884	42,722	43,576	44,448	45,337	**217,968**
Shared buildings - construction							
Shared Buildings – Overhead							
Subtotal	99,377	100,199	91,745	92,599	93,471	94,360	**472,373**
Grand Total	**7,745,407**	**12,494,138**	**16,388,672**	**21,352,107**	**22,144,832**	**20,967,710**	**93,347,458**
Routine Immunization	7,745,407	12,494,138	16,388,672	18,742,318	22,144,832	18,108,404	**87,878,365**
Supplemental immunization activities (campaigns)				2,609,789		2,859,305	**5,469,094**

Annex 2: Timeline of the implementation. cMYP 2016 – 2020

Key activities		2016	2017	2018	2019	2020
Objective 8:	To reach coverage of immunization of more than 95% of target population at the national level and at least 95% of target population at the district level and ensure equity in immunization service delivery through reducing percentage gap in Penta3 coverage between the highest and lowest performing provinces to 40% by 2020					
Strategy 8.1:	**To achieve > 95% Pent3 coverage among immunization target groups in at least 90% of the Provinces/Districts and LLGs by 2020 through effective implementation of SIREP and SIREP+ Programs**					
8.1.1:	Develop a list of high risk communities and collaborate with local authorities for household registration for immunization and other health services					
8.1.2:	Refresher training on immunization service delivery					
8.1.3:	Conduct supportive supervisory visits at the operational level					
8.1.4:	Expand RI service delivery services to all HFs by 2020					
8.1.5:	Organize trainings and workshops for HWs and EPI staff in micro planning at the Provinces/Districts/LLGs					
8.1.6:	Planning and implementation of Supplementary Immunization Activities in the low performing districts and among the high risk population groups					
Strategy 8.2:	**To reduce the percentage gap in Penta3 coverage between highest and lowest performing provinces to 30% by 2020**					
8.2.1:	Develop the micro-plans for low performing districts					
8.2.2:	Scale up outreach and mobile sessions to reach the hard-to-reach communities at least four (4) times a year					
8.2.3:	Increase immunization services (fixed and outreaches) in the hard-to-reach communities					
8.2.4:	Increase frequency of routine immunization sessions in urban facilities					
8.2.5:	Conduct supportive supervision and monitoring of RI (fixed and outreach sessions)					
8.2.6:	Planning and implementation of the SIAs in the low performing districts					
Objective 9:	To sustain polio free status					
Strategy 9.1:	**Increase coverage with polio vaccine through RI to 95% by 2020**					
9.1.1:	Increase RI sessions (fixed and outreach) in identified polio high risk Districts/LLGs					
9.1.2:	Conduct Planned 'Polio End Game' Activities (mop up operations)					
Strategy 9.2:	**Switch from tOPV to bOPV in the National schedule**					
9.2.1:	Implement preparatory activities (advocacy, sensitization, training, cold chain assessment)					
9.2.2:	Implement the national polio switch plan to switch from tOPV to bOPV					
Objective 10:	To eliminate Maternal-neonatal tetanus by 2020					
Strategy 10.1:	**Improved RI coverage with TT**					
10.1.1:	Conduct TT SIAs in 2018 and 2020					
Strategy 10.2:	**Accelerated TT outreach in high risk areas**					
10.2.1:	Use existing community mob/linkage activities to effectively target pregnant women					
Strategy 10.3:	**Increase ratio of clean deliveries**					
10.3.1:	Accelerate outreach for TT vaccination of CBAW in identified MNT high risk provinces and districts					
10.3.2:	Produce and disseminate IEC materials on TT importance /vaccinations					
10.3.3:	Capacity building (Train, retrain, equip) of health workers and VHVs on clean delivery practices					

Key activities	2016	2017	2018	2019	2020
Objective 11: To eliminate measles by 2020					
Strategy 11.1: To reduce measles morbidity by 90% and mortality by 95% by 2020					
11.1.1: Activities 1.1.1. – 1.1.5.					
11.1.2: Conduct MR SIAs in 2018 and 2020					
Objective 12: Hepatitis B control					
Strategy 12.1: See strategy 1.1.					
12.1.1: Activities 1.1.1. – 1.1.5.					
Objective 13: Introduce HPV vaccine in national Routine Immunization Schedule and achieve 95% coverage of HPV (for 9-14-years old girls) by 2020					
Strategy 13.1: Implementation of the SIREP Plus Strategy					
13.1.1: Develop the basic guide and manual for HPV Vaccine delivery					
13.1.2: Get stakeholder consensus on the guide and manual					
13.1.3: Finalize guide and manual					
13.1.4: Develop a micro-plan for HPV introduction					
13.1.5: Conduct HPV Demo project					
13.1.6: Analyse results of the DEMO project and document the lessons learnt					
13.1.7: Introduce HPV into RI schedule					
13.1.8: Conduct HPV vaccine post introduction evaluation					
13.1.9: Document lessons learnt					
Objective 14: Increase awareness and generate demand for immunization through effective coordination and collaboration among the communities and key stakeholders in NIP implementation as measured by decreased DTP1-DTP3 dropout rate					
Strategy 14.1: Implementation of SIREP strategy to ensure the availability of an MCH/EPI integrated communication plan for routine/supplemental immunization and surveillance activities in at least 75% of the provinces by 2020					
14.1.1: Develop and institutionalize the integrated MCH/EPI communication plan through active collaboration with other PH programs					
14.1.2: Implement the integrated communication plan at all levels					
14.1.3: Train EPI staff at all levels in application the tools and materials of the integrated communication plan					
14.1.4: Produce and distribute IEC and social mobilization materials among the target population at all levels					
Strategy 14.2: Implementation of the SIREP strategy to contribute in demand generation of communities for immunization services, through increasing awareness and participation of communities in the RI implementation					
14.2.1: Design and implement Awareness Raising/ Social Mobilization campaigns targeting all major stakeholders at all levels with the special emphasis on communities					
14.2.2: Develop materials for social/community mobilization activities					

Key activities		2016	2017	2018	2019	2020
14.2.3:	Train HW in application of the social community mobilization methods and materials					
14.2.4:	Engage community health workers to mobilize caregivers to access and utilize integrated EPI/MCH services in their communities in their respective communities					
14.2.5:	Develop social mobilization plans for Health Facilities					
14.2.6:	Organize meetings with community members to ensure their participation on Awareness raising and social mobilization activities					
Strategy 14.3:	**Collaboration with Key Stakeholders**					
14.3.1:	Establish effective and regular communication channels with the key stakeholder groups at all levels for ensure their participation/contribution in implementation of the RI					
14.3.2:	Conduct regular business meetings with the key stakeholder groups to ensure their participation and contribution in the planning and implementation of the EPI					
Strategy 14.4:	**Implementation of the advocacy plan targeting key stakeholder groups with the major emphasis on advocacy among the, policy- and decision-makers at all levels**					
14.4.1:	Develop of the advocacy plan					
14.4.2:	Conduct advocacy meetings with the high level political leadership and representatives of the ministries on the roles and responsibilities of key actors in implementation of the EPI					
14.4.3:	Conduct advocacy meetings with participation of provincial authorities, political leaders at the district level, opinion makers at the HF level on the roles and responsibilities in EPI implementation					
Strategy 14.5:	**Engage Mass Media in promotion of the EPI**					
14.5.1:	Sensitize media organizations on immunization issues as corporate social responsibility to attract free/discounted space/airtime					
14.5.2:	Develop a comprehensive media plan					
14.5.3:	Develop social marketing products appropriate for the country					
14.5.4:	Distribute social marketing materials in the identified media products (digital media, print media and etc.)					
Objective 15:	Availability of the high-standard vaccine management systems ensuring regular high quality vaccine supply at all levels					
Strategy 15.1:	**Implementation EVM improvement plan**					
15.1.1:	Forecast, order and supply vaccines to all Provinces, districts and HFs					
15.1.2:	Procure additional cold chain equipment to bridge identified gaps from the EVMA, according to 5 year cold chain plan					
Strategy 15.2:	**Improve vaccine arrival procedure**					
15.2.1:	Develop and use of a standardized arrival form for consumables					
Strategy 15.3:	**Improve temperature monitoring system through putting in place a system of early detection and action for safe-keeping of vaccines**					
15.3.1:	Place functional temperature recorders in all cold rooms					
15.3.2:	Map temperature of all cold and freezer rooms					
15.3.3:	Review monthly and keep temperature records at all levels.					
Strategy 15.4:	**Enhance the cold-chain maintenance system**					
15.4.1:	Develop and institutionalize preventive maintenance plans at all levels of the cold chain					

Key activities	2016	2017	2018	2019	2020
Strategy 15.5: Improve stock management practices					
15.5.1: Implement live computerized stocks management system					
15.5.2: Training of the cold-chain technicians in application of the stock management system tools					
Strategy 15.6: Improve distribution of vaccines at all levels					
15.6.1: Application of the push system for vaccines and devices at all levels tied to the coverage (quarterly from national to zones and states, monthly from LGA to HF)					
Strategy 15.7: Improve distribution of vaccines at all levels					
15.7.1: Train health workers on vaccine forecast, stock management, vaccine wastage management, monitoring and supportive supervision					
15.7.2: Provide adequate revised management tools at all levels					
15.7.3: Monitor and supervise teams at the subnational levels					
15.7.4: Expand the use of incinerators at state and service delivery levels for proper immunization waste management					
Objective 16: To strengthen & sustain disease surveillance and HMIS for targeted VPDs and ensure availability of the quality data on RI at district and provincial levels with reporting rate of immunization to 95% by 2020					
Strategy 16.1: Improve disease surveillance and reporting systems					
16.1.1: Active AFP surveillance in all Provinces combined with other VPDs (MNT & measles) surveillance					
16.1.2: Training & retraining of HWs on case identification & reporting in all Health Facilities					
16.1.3: Establish data base on DSR					
16.1.4: Hold regular/quarterly meetings on AFP surveillance with the relevant stakeholders					
Strategy 16.2: Strengthen case-base and laboratory-based surveillance					
16.2.1: identify laboratories for collaboration on Polio & measles lab base surveillance					
16.2.2: Train managers and frontline health workers on data management for effective feedback on surveillance and performance					
16.2.3: Provide feedback on surveillance and performance data to Provinces and Districts					
Strategy 16.3: Capacity building on community surveillance for targeted VPDs by 2020					
16.3.1: Scale-up surveillance scope at the HF level, through training of service providers in standard surveillance methods and forms					
16.3.2: Train HWs on community sensitization on community surveillance					
Strategy 16.4: Monitoring and reporting AEFI					
16.4.1: Integrate AEFI surveillance with disease surveillance					
16.4.2: Provide appropriate AEFI data tools					
16.4.3: Training HWs					
16.4.4: Conduct regular monitoring and reporting of AEFI					
16.4.5: Conduct Bi-annual meetings on AEFI with participation of the key stakeholders at State and National levels					
Strategy 16.5: Development and implementation of the outbreak preparedness and response systems					
16.5.1: Establishment of the Outbreak Preparedness & Response Committees at all levels					
16.5.2: Conduct regular meetings of OPR Committees					

Key activities		2016	2017	2018	2019	2020
16.5.3:	Preposition emergency drugs & supplies					
16.5.4:	Ensure adequate funding and logistics for preparedness and prompt response to disease outbreaks					
16.5.5:	Conduct outbreak investigation for reported cases					
Strategy 16.6:	**Implementation of the data collection systems at all levels**					
16.6.1:	Provide appropriate data capturing tools and equipment at District and health facility levels					
16.6.2:	Provide training health workers on application of the HMIS tools					
16.6.3:	Conduct regular supportive supervision so that each HF is visited at least 6-monthly					
16.6.4:	Conduct advocacy to community leaders, religious leaders on data ownership and use of data for action					
16.6.5:	Develop community data tools					
16.6.6:	Redefine denominator using Birth registration system					
16.6.7:	Provide regular feedback to districts, provinces and partners					
Strategy 16.7:	**Implementation of the data quality assessment system in all provinces by 2018**					
16.7.1:	Conduct quarterly DQA at all levels					
16.7.2:	Establish integrated data management teams at the Province, district and health facility levels					
16.7.3:	Conduct regular meetings of data management teams					
16.7.4:	Conduct national data survey on RI on a regular basis					
16.7.5:	Train and retrain data officers in data validation					
Objective 17:	To build capacity of frontline heath workers and EPI managers at all levels and ensure availability of adequate human resources in accordance with the minimum volume of EPI/MCH services by 2020					
Strategy 17.1:	**Building capacity of health workers for quality service delivery**					
17.1.1:	Provide Integrated service provision Management Training for frontline health workers					
17.1.2:	Provide MLM training for EPI managers					
17.1.3:	Provide cold chain/vaccine management training for cold chain staff					
17.1.4:	Ensure Utilization on-the-job training methods such as Mentorship, and supportive supervision					
Strategy 17.2:	**Improve motivation of front line service providers for integrated service provision**					
17.2.1:	Develop performance based management system (annual reviews, rewards/promotions, sanctions)					
17.2.2:	Implement the developed performance based management system					
Strategy 17.3:	**Implement of the" health workforce enhancement plan" of NDoH**					
17.3.1:	Revise "health workforce "enhancement plan" to determine current HR gaps by disposition of staff					
17.3.2:	Determine HR optimization strategy					
17.3.3:	Redistribute health care workers to areas of low staff availability					
17.3.4:	Recruit Health workers to fill identified HR gaps					

Key activities	2016	2017	2018	2019	2020
Objective 18: To ensure sustainable, adequate and timely release of funds at all levels of government by 2020					
Strategy 18.1: Advocacy to relevant ministries and department for adequate budgeting and timely release of funds					
18.1.1: Advocate to all ministries and departments involved in the budget development process for adequate budgeting and timely release of funds					
18.1.2: Advocate to Provincial authorities for adequate budgeting and timely release of funds to reduce funding gap for in immunization financing					
Strategy 18.2: Secure financing for traditional and new vaccines & devices					
18.2.1: Perform Advocacy for the application of the National health bill at all levels					
18.2.2: Prepare and submit annual request for funding of traditional vaccines and injection supplies					
18.2.3: Prepare and submit request for co-financing of new- vaccines					
Strategy 18.3: Increase budgetary support for RI at all levels					
18.3.1: Identify and use key stakeholder forums for increase budgetary allocation and timely release of funds					
18.3.2: Tracking of budget by higher levels of government					
Objective 19: EPI management improvement at all levels through application of the evidence-based planning and implementation of RI activities through a robust M & E process by 2020					
Strategy 19.1: Institutionalize a comprehensive M & E system					
19.1.1: Monitor immunization coverage monthly, sending feedback report to provinces and districts					
19.1.2: Monitor and verify vaccine stock distribution					
19.1.3: Monitor overall impact of RI on morbidity and mortality rates of under 5 children					
Strategy 19.2: Strengthening Partnership					
19.2.1: review protocols for engagement of partners for providing RI services (e.g. private health institutions, organizations working on health-related issues, etc.)					
19.2.2: Conduct training for HF staff of private institutions on RI services and reporting					
Strategy 19.3: To incorporate the accountability framework for routine immunization in annual routine immunization operational plan at the National, Province, District and HF level					
19.3.1: Develop annual operational plan for routine immunization for National, Province, district and health facility Levels					
19.3.2: Develop governance structure to include all appropriate stakeholders (national, province, district and LLG, community & partners/donors)					
19.3.3: Appoint a facilitator at regional & province level to organize the review meetings and document results					
19.3.4: Develop budget tracking tool to monitor expenditure for Routine Immunization at the national, province, district and LLG levels					
Strategy 19.4: To improve the evidence base for decision making & planning on immunization programs					
19.4.1: Establish a standing inter-agency research working group					
19.4.2: Conduct study on immunization					
19.4.3: Conduct NDHS on RI services					
19.4.4: Conduct economic evaluations (e.g. cost effectiveness analysis) of new vaccines and of strategies to improve immunization					
19.4.5: Conduct annual KAP for immunization services					
19.4.6: Conduct regular Communication Reviews					

Key activities		2016	2017	2018	2019	2020
Strategy 19.5: Improve coordination and collaboration between RI program and all other MCH program areas						
19.5.1:	Establish regular joint planning meetings at national and state level					
19.5.2:	Conduct periodic joint monitoring missions					
19.5.3:	Produce joint commodities distribution plans at all levels leveraging existing logistic systems					
19.5.4:	Conduct joint training of health workers across all program areas					
19.5.5:	Include vitamin A administration during SIAs					

Annex 3: Specific objectives, Strategies and Activities of the cMYP 2016-2020

Specific objective	Strategy	Activities
SERVICE DELIVERY		
SO1: To reach coverage of immunization of more than 95% of target population at the national level and at least 95% of target population at the district level and ensure equity in immunization service delivery through reducing percentage gap in Penta3 coverage between the highest and lowest performing provinces to 40% by 2020	1.1. To achieve > 95% Penta3 coverage among immunization target groups in at least 90% of the Provinces/Districts and LLGs by 2020 through effective implementation of SIREP and SIREP+ Programs	1.1.1. Provide Integrated service provision Management Training for frontline service providers 1.1.2. Provide MLM training for EPI managers 1.1.3. Ensure Utilization on-the-job training methods such as Mentorship, and supportive supervision 1.1.4. Develop a list of high risk communities and collaborate with local authorities for household registration for immunization and other health services 1.1.5. Accelerate service delivery through outreach and mobile sites 1.1.6. Conduct supportive supervisory visits at the operational level 1.1.7. Expand RI service delivery services to all HFs by 2020 1.1.8. Train HWs and EPI staff in micro planning at all levels
	1.2. To reduce the percentage gap in Penta3 coverage between highest and lowest performing provinces to 30% by 2020	1.2.1. Develop the micro-plans for low performing districts 1.2.2. Scale up outreach and mobile sessions to reach the hard-to-reach communities at least four (4) times a year 1.2.3. Increase immunization services (fixed and outreaches) in the hard-to-reach communities 1.2.4. Increase frequency of routine immunization sessions in urban facilities 1.2.5. Conduct supportive supervision and monitoring of RI (fixed and outreach sessions) 1.2.6. Planning and implementation of the SIAs in the low performing districts
SO2: To sustain polio free status	2.1. Increase coverage with polio vaccine through RI to 95% by 2020	2.1.1. Increase RI sessions (fixed and outreach) in identified polio high risk Districts/LLGs 2.1.2. Conduct Planned 'Polio End Game' Activities (mop up operations)
	2.2. Switch from tOPV to bOPV in the Routine Immunization schedule	2.2.1. Implement preparatory activities (advocacy, sensitization, training, cold chain assessment) 2.2.2. Implement the national polio switch plan to switch from tOPV to bOPV
SO3: To eliminate Maternal-neonatal tetanus by 2020	3.1. Improved RI coverage with TT	3.1.1. Conduct TT SIAs in 2018 and 2020
	3.2. Accelerated TT outreach in high risk areas	3.2.1. Use existing community mob/linkage activities to effectively target pregnant women
	3.3. Increase ratio of clean deliveries	3.3.1. Accelerate outreach for TT vaccination of CBAW in identified MNT high risk provinces and districts 3.3.2. Produce and disseminate IEC materials on TT importance /vaccinations 3.3.3. Capacity building (Train, retrain, equip) of health workers and VHVs on clean delivery practices
SO4: To eliminate measles by 2020	4.1. To reduce measles morbidity by 90% and mortality by 95% by 2020	4.1.1. Activities 1.1.1. – 1.1.5. 4.1.2. Conduct MR SIAs in 2018 and 2020
SO5: Hepatitis B control	5.1. Increase coverage of Hepatitis B Birth Dose	5.1.1. Conduct refreshment training of the service provider staff in Hepatitis B vaccine administration 5.1.2. Send circular and reminders to all health facilities to give Hepatitis B birth dose within 24 hours of birth
SO6: Introduce HPV vaccine in national Routine Immunization Schedule and achieve 95% coverage of HPV (for 9-14-years old girls) by 2020	6.1. Implementation of the SIREP Plus Strategy	6.1.1. Develop the basic guide and manual for HPV Vaccine delivery 6.1.2. Reach stakeholder consensus on the guide and manual 6.1.3. Finalize guide and manual 6.1.4. Develop a micro-plan for HPV introduction 6.1.5. Conduct HPV Demo project

Specific objective	Strategy	Activities
		6.1.6. Analyze results of the DEMO project and document the lessons learnt 6.1.7. Introduce HPV into RI schedule 6.1.8. Conduct HPV vaccine post introduction evaluation 6.1.9. Document lessons learnt
DEMAND GENERATION AND COMMUNICATION		
Specific objective	**Strategy**	**Activities**
SO7: Increase awareness and generate demand for immunization through effective coordination and collaboration among the communities and key stakeholders in NIP implementation as measured by decreased DTP1-DTP3 dropout rate	7.1. Implementation of SIREP strategy to ensure the availability of an MCH/EPI integrated communication plan for routine/supplemental immunization and surveillance activities in at least 75% of the provinces by 2020	7.1.1. Develop and institutionalize the integrated MCH/EPI communication plan through active collaboration with other PH programs 7.1.2. Implement the integrated communication plan at all levels 7.1.3. Train EPI staff at all levels in application the tools and materials of the integrated communication plan 7.1.4. Produce and distribute IEC and social mobilization materials among the target population at all levels.
	7.2. Implementation of the SIREP strategy to contribute in demand generation of communities for immunization services, through increasing awareness and participation of communities in the RI implementation	7.2.1. Design and implement Awareness Raising/ Social Mobilization campaigns targeting all major stakeholders at all levels with the special emphasis on communities 7.2.2. Develop materials for social/community mobilization activities 7.2.3. Train HW in application of the social community mobilization methods and materials 7.2.4. Engage community health workers to mobilize caregivers to access and utilize integrated EPI/MCH services in their communities in their respective communities 7.2.5. Develop social mobilization plans for Health Facilities 7.2.6. Organize meetings with community members to ensure their participation on Awareness raising and social mobilization activities
	7.3. Collaboration with Key Stakeholders	7.3.1. Establish effective and regular communication channels with the key stakeholder groups at all levels for ensure their participation/contribution in implementation of the RI. 7.3.2. Conduct regular business meetings with the key stakeholder groups to ensure their participation and contribution in the planning and implementation of the EPI
	7.4. Implementation of the advocacy plan targeting key stakeholder groups with the major emphasis on advocacy among the, policy- and decision-makers at all levels	7.4.1. Develop of the advocacy plan 7.4.2. Conduct advocacy meetings with the high level political leadership and representatives of the ministries on the roles and responsibilities of key actors in implementation of the EPI 7.4.3. Conduct advocacy meetings with participation of provincial authorities, political leaders at the district level, opinion makers at the HF level on the roles and responsibilities in EPI implementation
	7.5. Engage Mass Media in promotion of the EPI	7.5.1. Sensitize media organizations on immunization issues as corporate social responsibility to attract free/discounted space/airtime 7.5.2. Develop a comprehensive media plan 7.5.3. Develop social marketing products appropriate for the country 7.5.4. Distribute social marketing materials in the identified media products (digital media, print media and etc.)
VACCINE SECURITY, COLD CHAIN AND LOGISTICS MANAGEMENT		
Specific objective	**Strategy**	**Activities**
SO8: Availability of the high-standard vaccine management	7.6. Implementation EVM improvement plan	7.6.1. Provide cold chain/vaccine management training for cold chain staff 7.6.2. Forecast, order and supply vaccines to all states / LGAs / SDPs

Specific objective	Strategy	Activities
systems ensuring regular high quality vaccine supply at all levels		7.6.3. Procure additional cold chain equipment to bridge identified gaps from the EVMA, according to 5 year cold chain plan
	7.7. Improve vaccine arrival procedure	7.7.1. Develop and use of a standardized arrival form for consumables
	7.8. Improve temperature monitoring system through putting in place a system of early detection and action for safe-keeping of vaccines	7.8.1. Place functional temperature recorders in all cold rooms 7.8.2. Map temperature of all cold and freezer rooms 7.8.3. Review monthly and keep temperature records at all levels.
	7.9. Enhance the cold-chain maintenance system	7.9.1. Develop and institutionalize preventive maintenance plans at all levels of the cold chain
	7.10. Increase the quality of stock management	7.10.1. Implement live computerized stocks management system 7.10.2. Training of the cold-chain technicians in application of the stock management system tools
	7.11. Improve distribution of vaccines at all levels	7.11.1. Application of the push system for vaccines and devices at all levels tied to the coverage (quarterly from national to regions and provinces, monthly from districts to HFs)
	7.12. Build capacity of cold chain officers to maintain cold chain equipment	7.12.1. Train health workers on vaccine forecast, stock management, vaccine wastage management, monitoring and supportive supervision 7.12.2. Provide adequate revised management tools at all levels 7.12.3. Monitor and supervise teams at the subnational levels 7.12.4. Expand the use of incinerators at state and service delivery levels for proper immunization waste management
SURVEILLANCE AND REPORTING		
Specific objective	**Strategy**	**Activities**
SO9: To strengthen & sustain disease surveillance and HMIS for targeted VPDs and ensure availability of the quality data on RI at district and provincial levels with reporting rate of immunization to 95% by 2020	9.1. Improve disease surveillance and reporting systems	9.1.1. Active AFP surveillance in all Provinces combined with other VPDs (MNT & measles) surveillance 9.1.2. Training & retraining of HWs on case identification & reporting in all Health Facilities 9.1.3. Establish data base on DSR 9.1.4. Hold regular/quarterly meetings on AFP surveillance with the relevant stakeholders
	9.2. Strengthen case-base and laboratory-based surveillance	9.2.1. identify laboratories for collaboration on Polio & measles lab base surveillance 9.2.2. Train managers and frontline health workers on data management for effective feedback on surveillance and performance 9.2.3. Provide feedback on surveillance and performance data to Provinces and Districts
	9.3. Capacity building on community surveillance for targeted VPDs by 2020	9.3.1. Scale-up surveillance scope at the HF level, through training of service providers in standard surveillance methods and forms 9.3.2. Train HWs on community sensitization on community surveillance
	9.4. Monitoring and reporting AEFI	9.4.1. Integrate AEFI surveillance with disease surveillance 9.4.2. Provide appropriate AEFI data tools 9.4.3. Training HWs 9.4.4. Conduct regular monitoring and reporting of AEFI 9.4.5. Conduct Bi-annual meetings on AEFI with participation of the key stakeholders at State and National levels
	9.5. Development and implementation of the outbreak preparedness and response systems	9.5.1. Establishment of the Outbreak Preparedness & Response Committees at all levels 9.5.2. Conduct regular meetings of OPR Committees 9.5.3. Preposition emergency drugs & supplies 9.5.4. Ensure adequate funding and logistics for preparedness and prompt response to disease outbreaks

Specific objective	Strategy	Activities
		9.5.5. Conduct outbreak investigation for reported cases
	9.6. Implementation of the data collection systems at all levels	9.6.1. Provide appropriate data capturing tools and equipment at District and health facility levels 9.6.2. Provide training health workers on application of the HMIS tools 9.6.3. Conduct regular supportive supervision so that each HF is visited at least 6-monthly 9.6.4. Conduct advocacy to community leaders, religious leaders on data ownership and use of data for action 9.6.5. Develop community data tools 9.6.6. Redefine denominator using Birth registration system 9.6.7. Provide regular feedback to districts, provinces and partners
	9.7. Implementation of the data quality assessment system in all provinces by 2018	9.7.1. Conduct quarterly DQA at all levels 9.7.2. Establish integrated data management teams at the Province, district and health facility levels 9.7.3. Conduct regular meetings of data management teams 9.7.4. Conduct national data survey on RI on a regular basis 9.7.5. Train and retrain data officers in data validation
HUMAN RESOURCE MANAGEMENT		
SO10: To build capacity of frontline heath workers and EPI managers at all levels and ensure availability of adequate human resources in accordance with the minimum volume of EPI/MCH services by 2020	10.1 Improve motivation of front line service providers for integrated service provision	10.1.1. Develop performance based management system (annual reviews, rewards/promotions, sanctions) 10.1.2. Implement the developed performance based management system
	10.2 Implement of the" health workforce enhancement plan" of NDoH	10.3.1. Revise "health workforce "enhancement plan" to determine current HR gaps by disposition and cadre; 10.3.2. Determine HR optimization strategy 10.3.3. Redistribute health care workers to areas of low staff availability 10.3.4. Recruit Health workers to fill identified HR gaps
COSTING AND FINANCING AND RESOURCE MOBILIZATION		
SO11: To ensure sustainable, adequate and timely release of funds at all levels of government by 2020	11.1 Advocacy to relevant ministries and department for adequate budgeting and timely release of funds	11.1.1. Advocate to all ministries and departments involved in the budget development process for adequate budgeting and timely release of funds 11.1.2. Advocate to Provincial authorities for adequate budgeting and timely release of funds to reduce funding gap for in immunization financing
	11.2 Secure financing for traditional and new vaccines & devices	11.2.1. Perform Advocacy for the application of the National health bill at all levels 11.2.2. Prepare and submit annual request for funding of traditional vaccines and injection supplies 11.2.3. Prepare and submit request for co-financing of new-vaccines
	11.3 Increase budgetary support for RI at all levels	11.3.1. Identify and use key stakeholder forums for increase budgetary allocation and timely release of funds 11.3.2. Tracking of budget by higher levels of government
PROGRAM MANAGEMENT		
SO12: EPI management improvement at all levels through application of the evidence-based planning and implementation of RI activities through a robust M & E process by 2020	12.1. Institutionalize a comprehensive M & E system	12.1.1. Monitor immunization coverage monthly, sending feedback report to provinces and districts 12.1.2. Monitor and verify vaccine stock distribution 12.1.3. Monitor overall impact of RI on morbidity and mortality rates of under 5 children
	12.2. Strengthening Partnership	12.2.1. review protocols for engagement of partners for providing RI services (e.g. private health institutions, organizations working on health-related issues, etc.) 12.2.2. Conduct training for HF staff of private institutions on RI services and reporting

Specific objective	Strategy	Activities
	12.3. To incorporate the accountability framework for routine immunization in annual routine immunization operational plan at the National, Province, District and HF level	12.3.1. Develop annual operational plan for routine immunization for National, Province, district and health facility Levels 12.3.2. Develop governance structure to include all appropriate stakeholders (national, province, district and LLG, community & partners/donors) 12.3.3. Appoint a facilitator at regional & province level to organize the review meetings and document results 12.3.4. Develop budget tracking tool to monitor expenditure for Routine Immunization at the national, province, district and LLG levels
	12.4. To improve the evidence base for decision making & planning on immunization programs	12.4.1. Establish a standing inter-agency research working group 12.4.2. Conduct study on immunization 12.4.3. Conduct NDHS on RI services 12.4.4. Conduct economic evaluations (e.g. cost effectiveness analysis) of new vaccines and of strategies to improve immunization 12.4.5. Conduct annual KAP for immunization services 12.4.6. Conduct regular Communication Reviews
	12.5. Improve coordination and collaboration between RI program and all other MCH program areas	12.5.1. Establish regular joint planning meetings at national and state level 12.5.2. Conduct periodic joint monitoring missions 12.5.3. Produce joint commodities distribution plans at all levels leveraging existing logistic systems 12.5.4. Conduct joint training of health workers across all program areas 12.5.5. Include vitamin A administration during SIAs

Annex 4: Alignment of PNG cMYP 2016-2020 with Global and Regional Goals

GVAP Goals 2011-2020	Immunization Goals in WPR	PNG National Goals
1. **Achieve world free of poliomyelitis**	1. Sustaining polio-free status	Goal 1: To sustain Polio free status
2. **Meet global and regional disease elimination targets (includes neonatal, tetanus, measles and rubella elimination targets)**	2. MNT Elimination	Goal 2: To eliminate Maternal-neonatal tetanus by 2020
	3. Measles Elimination	Goal 3: Eliminate measles and rubella by 2020
	4. Accelerated control of Hepatitis B	Goal 4: Control Hepatitis B
	5. Accelerated control of Japanese Encephalitis	-
3. **Meet vaccination coverage targets in every region, country and community**	6. Meeting regional vaccination coverage targets	Goal 5: to reach coverage of immunization of more than 90% of target population at the national level and at least 90% of target population at the district level
4. **Develop and introduce new and improved vaccines and technologies**	7. Introduction of new vaccines	Goal 6: To introduce HPV vaccine and achieve 85% coverage rate (among 9-14-years old girls) by 2020
5. **Exceed MDG4 target for reducing child mortality**	-	-

Annex 5: GVAP checklist

GVAP Strategies	Key Activities	Activity included in cMYP			
		Yes	No	Not applicable	New activity needed
Strategic objective 1: All countries commit to immunization as a priority.					
Establish and sustain commitment to immunization.	Ensure legislation or legal framework in all countries, including provisions for a budget line for immunization, and for monitoring and reporting.	✓			
	Develop comprehensive national immunization plans that are part of overall national health plans through a bottom-up process including all stakeholders.	✓			
	Set ambitious but attainable country-specific targets within the context of morbidity and mortality reduction goals.	✓			
	Scrutinize, defend, and more closely follow immunization budgets, disbursements and immunization programme activities.	✓			
	Support local civil society organizations and professional associations to contribute to national discussions of immunizations and health.	✓			
Inform and engage opinion leaders on the value of immunization.	Explore models to promote collaboration between the stakeholders that generate evidence on immunization and those who use it to set priorities and formulate policies.	✓			
	Develop and disseminate the evidence base on the public health value of vaccines and immunization and the added value of achieving equity in access and use of immunization.	✓			
	Develop and disseminate the evidence base for the broad economic benefits of immunization for individuals, households, communities, and countries.	✓			
	Include immunization in the agendas of governing body meetings at all levels and in other social, health and economic forums.	✓			
Strengthen national capacity to formulate evidence-based policies.	Create or strengthen independent bodies that formulate national immunization policies (for example, NITAGs or regional technical advisory groups).	✓			
	Develop more effective ways for National Regulatory Agencies (NRAs), Health Sector Coordination Committees (HSCCs), and Interagency Coordination Committees (ICCs) to support immunization programmes as part of disease control programmes and preventive health care.	✓			
	Create regional forums and peer-to-peer exchange of information, best practices and tools.	✓			
	Create expanded and more transparent mechanisms for aggregating, sharing, and using information to monitor commitments.	✓			
Strategic objective 2: Individuals and communities understand the value of vaccines and demand immunization as both their right and responsibility.					
Engage individuals and communities on the benefits of immunization and hear their concerns.	Engage in a dialogue which both transmits information and responds to people's concerns and fears.	✓			
	Utilize social media tools and lessons from commercial and social marketing efforts.	✓			
	Leverage new mobile and Internet-based technologies.	✓			
	Include immunization in the basic education curriculum.		✓		
	Conduct communications research.	✓			
Create incentives to stimulate demand.	Create incentives to households and health workers for immunization, where appropriate and while respecting the autonomy of beneficiaries (for example, cash or in-kind transfers, bundling of services, media recognition).	✓			
	Conduct social research to improve the delivery of immunization services and the ability to meet the needs of diverse communities.	✓			

GVAP Strategies	Key Activities	Activity included in cMYP			
		Yes	No	Not applicable	New activity needed
Build advocacy capacity.	Recruit new voices, including those of educators, religious leaders, traditional and social media personalities, family physicians, community health workers, and trained immunization champions (among others).	✓			
	Train healthcare workers on effective communication techniques, especially to address vaccine hesitancy and to respond to reports of serious adverse events following immunization in order to maintain trust and allay fears.	✓			
	Engage, enable and support in-country CSOs to advocate to local communities and policy-makers and in local and global media regarding the value of vaccines.	✓			
	Create national or regional advocacy plans that involve in-country CSOs.		✓		
	Link global, national and community advocacy efforts with professional and academic networks.	✓			
Strategic objective 3: The benefits of immunization are equitably extended to all people.					
Develop and implement new strategies to address inequities.	Recast "Reaching Every District" to "Reaching Every Community" to address inequities within districts.	✓			
	Engage underserved and marginalized groups to develop locally tailored, targeted strategies for reducing inequities.	✓			
	Introduce appropriate new vaccines in national immunization programs (see also Objective 5).	✓			
	Establish a life course approach to immunization planning and implementation, including new strategies to ensure equity across the life span.			✓	
	Prevent and respond to vaccine-preventable diseases during disease outbreaks, humanitarian crises, and in conflict zones.	✓			
Build knowledge base and capacity to enable equitable delivery.	Track each individual's immunization status, leveraging immunization registries, electronic databases and national identification number systems.	✓			
	Take advantage of community structures to enhance communication and deliver services (for example, traditional birth attendants, birth registries).	✓			
	Involve CSOs in community outreach and planning.		✓		
	Develop new approaches to community engagement for urban and peri-urban areas.	✓			
	Train health workers and CSOs on how to engage communities, identify influential people who can assist in planning, organizing and monitoring health and immunization programs, identify community needs and work with communities to meet those needs.	✓			
	Conduct operational and social science research to identify successful strategies to reduce inequities and improve the quality and delivery of immunization services.	✓			
Strategic objective 4: Strong immunization systems that are an integral part of a well-functioning health system.					
Develop comprehensive and coordinated approaches.	Ensure that global vaccine programs focusing on eradication and elimination goals are incorporated into national immunization programs.	✓			
	Ensure that new vaccine deployment is accompanied by comprehensive disease control plans	✓			
	Ensure coordination between the public and private sectors for new vaccine introduction, reporting of vaccine-preventable diseases and administration of vaccines, and ensure quality of vaccination in the public and private sectors.	✓			
	Consider the inclusion of vaccines in health programs across the life course.			✓	
	Improve the quality of all immunization administrative data and promote its analysis and use at all administrative levels to improve programme performances.	✓			

GVAP Strategies	Key Activities	Activity included in cMYP			
		Yes	No	Not applicable	New activity needed
Strengthen monitoring and surveillance systems.	Develop and promote the use of new technologies for collection, transmission and analysis of immunization data.	✓			
	Further strengthen, improve quality and expand disease surveillance systems to generate information based on laboratory confirmed cases for decision-making, monitoring the impact of immunization on morbidity and mortality and changes in disease epidemiology.	✓			
	Ensure capacity for vaccine safety activities, including capacity to collect and interpret safety data, with enhanced capacity in countries that introduce newly developed vaccines.	✓			
Strengthen capacity of managers and frontline workers.	Ensure that immunization and other primary health care programs have adequate human resources to schedule and deliver predictable services of acceptable quality.	✓			
	Increase levels of pre-service, in-service and post-service training for human resources, and develop new, relevant curricula that approach immunization as a component of comprehensive disease control.	✓			
	Promote coordinated training and supervision of community-based health workers.	✓			
Strengthen infrastructure and logistics.	Innovate to improve cold chain capacity and logistics, as well as waste management.	✓			
	Minimize the environmental impact of energy, materials and processes used in immunization supply systems, both within countries and globally.	✓			
	Staff supply systems with adequate numbers of competent, motivated and empowered personnel at all levels.	✓			
	Establish information systems that help staff accurately track the available supply.	✓			
Strategic objective 5: Immunization programs have sustainable access to predictable funding, quality supply and innovative technologies.					
Increase total amount of funding.	Establish a commitment for governments to invest in immunization according to their ability to pay and the expected benefits.	✓			
	Engage new potential domestic and development partners and diversify sources of funding.	✓			
	Develop the next generation of innovative financing mechanisms.			✓	
Increase affordability for middle-income countries.	Explore differential pricing approaches to define explicit criteria for price tiers and the current and future prices to be made available to lower middle-income and middle-income countries.			✓	
	Explore pooled negotiation or procurement mechanisms for lower-middle-income and middle income countries.			✓	
Improve allocation of funding in low- and middle-income countries.	Strengthen budgeting and financial management in-country to better integrate financial and health care planning and priority setting.	✓			
	Coordinate funding support from development partners and other external sources.	✓			
	Evaluate and improve funding support mechanisms on the basis of their effectiveness in reaching disease goals.	✓			
	Base funding on transparency and objectivity in order to ensure the sustainability of programs.	✓			
	Promote the use of cost and cost-benefit arguments in fund raising, decision-making, and defense of immunization funding.	✓			
	Explore pay-for-performance funding systems.		✓		
Secure quality supply	Build and support networks of regulators and suppliers to share best practices and to improve quality assurance capabilities and quality control.			✓	
	Develop tools to strengthen global standardization of manufacturing and regulatory processes.			✓	
	Strengthen national regulatory systems and develop globally harmonized regulations.			✓	

GVAP Strategies	Key Activities	Activity included in cMYP			
		Yes	No	Not applicable	New activity needed
	Ensure a forum where countries can communicate expected demand for vaccines and technologies and provide guidance to manufacturers on desired product profiles.			✓	
Strategic objective 6: Country, regional and global R&D innovations maximize the benefits of immunization.					
Expand capabilities and increase engagement with end-users.	Engage with end users to prioritize vaccines and innovations according to perceived demand and added value.			✓	
	Establish platforms for exchange of information on immunization research and consensus building.			✓	
	Build more capacity and human resources in low- and middle-income countries to conduct R&D and operational research.			✓	
	Increase networking among research centers for efficient building of partnerships among high-, middle- and low-income countries' institutions.			✓	
	Promote collaboration between traditional research disciplines and scientists from disciplines not previously engaged in vaccine research.			✓	
Enable the development of new vaccines	Research on the fundamentals of innate and adaptive immune responses, particularly in humans.			✓	
	Research on immunologic and molecular characteristics of microbes.			✓	
	Improve understanding of the extent and causes of variation in pathogen and human population responses to vaccines.			✓	
Accelerate development, licensing and uptake of vaccines.	Promote greater access to technology, know-how and intellectual property for adjuvants and their formulation into vaccines.			✓	
	Develop non-syringe delivery mechanisms and vaccine packaging that best suit the needs and constraints of countries' programs.			✓	
	Develop thermo-stable rotavirus and measles vaccines.			✓	
	Develop new bioprocessing and manufacturing technologies.			✓	
	Develop a global, regulatory science research agenda.			✓	
	Adopt best practices in portfolio and partnership management for R&D			✓	
Improve programme efficiencies and increase coverage and impact.	Research the use of more effective information through modern communication technologies.	✓			
	Conduct representative epidemiological, immunological, social and operational studies and investigations of vaccine impact to guide health economics analysis.	✓			
	Perform operational research on improved delivery approaches for life course immunization, and vaccination in humanitarian emergencies, fragile states and countries in and emerging from conflict.	✓			
	Perform research on interference effects and optimum delivery schedules.			✓	
	Perform research to develop improved diagnostic tools for conducting surveillance in low-income countries.			✓	

Annex 6: Health Financing in PNG

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Total expenditure on health (THE) in million US$	**139**	**205**	**234**	**252**	**351**	**312**	**327**	**256**	**324**	**353**	**406**	**636**	**700**	**737**
Total Health Expenditure (THE) per Capita in US$	26	37	41	44	59	51	52	40	50	53	59	91	98	101
Total Health Expenditure (THE) per Capita in Int$ (PPP)	59	98	114	105	135	104	99	73	77	87	89	116	115	127
Total Health Expenditure (THE) % Gross Domestic Product (GDP)	4.0	6.7	7.7	6.8	8.4	6.4	5.9	4.0	4.1	4.4	4.2	4.9	4.6	4.8
General government expenditure on health (GGHE) in million US$	**114**	**181**	**205**	**224**	**317**	**266**	**280**	**198**	**246**	**261**	**309**	**520**	**562**	**602**
Ministry of Health expenditure in million US$	50	59	46	40	34	39	37	41	57	60	76	200	119	135
General Government Health Expenditure (GGHE) per Capita in US$	21	33	36	39	53	44	45	31	38	39	45	74	79	82
General Government Health Expenditure (GGHE) per Capita Int$ (PPP)	48	86	99	94	123	89	85	56	59	64	68	95	92	103
General Government Health Expenditure (GGHE) as % of THE	81.7	88.3	87.4	88.7	90.6	85.3	85.5	77.4	75.8	73.9	76.2	81.8	80.3	81.7
GGHE as % of General government expenditure (GGE)	9.9	17.3	21.7	21.1	24.8	15.5	14.8	9.0	8.8	10.8	10.4	13.2	11.7	11.2
GGHE as % of GDP	3.3	5.9	6.7	6.0	7.6	5.5	5.1	3.1	3.1	3.2	3.2	4.0	3.7	3.9
Private expenditure on health in million US$	**25**	**24**	**30**	**29**	**33**	**46**	**48**	**58**	**78**	**92**	**96**	**116**	**138**	**134**
Private Health Expenditure (PvtHE) as % of THE	18.3	11.7	12.6	11.3	9.4	14.7	14.5	22.6	24.2	26.1	23.8	18.2	19.7	18.3
Rest of the world funds / External resources in million US$	**33**	**32**	**46**	**54**	**85**	**77**	**51**	**59**	**56**	**61**	**80**	**107**	**179**	**142**
Rest of the world funds as % of THE	23.8	15.7	19.5	21.4	24.2	24.6	15.6	23.1	17.3	17.2	19.6	16.8	25.5	19.3
GDP per capita (in US$)	651	556	539	641	703	799	886	993	1,223	1,211	1,419	1,839	2,151	2,109
GGE as % of GDP	32.9	34.1	31.0	28.5	30.7	35.2	34.1	34.8	35.0	29.9	30.6	30.7	31.3	35.0
Exchange rate (NGN per US$)	1	1	1	1	1	2	2	2	2	2	2	2	2	2

Annex 7: Health workforce for immunization by levels and type (dedicated and shared)

	Number of positions filled	% Time working for Immunization	Full time equivalent (FTE)		
			Dedicated	**Shared**	**Total**
National					
Executive Manager Public Health	1	10%		1	1
Principal Advisor Family Health Services	1	25%		1	1
Technical Advisor Child Health	1	40%		1	1
Technical Advisor EPI	1	100%	1		1
Technical Officer EPI	1	100%	1		1
Technical Officer Vaccine Management	1	100%	1		1
Technical Officer Cold Chain	1	100%	1		1
Technical Officer Immu & Disease Surv	1	100%	1		1
Admin Officer	1	25%		1	1
Subtotal National	**9**	**67%**	**5**	**4**	**9**
Province					
Provincial Health Advisor	1	5%		1	1
Chief Executive Officer Hospital	1	5%		1	1
Paediatricians	2	40%		2	2
Family Health Coordinator	1	80%		1	1
Provincial Disease Control Officer	1	20%		1	1
Cold Chain Logistic Officer	1	100%	1		1
CCE Technical Officer	1	100%	1		1
Secretary	1	50%		1	1
Driver	1	50%		1	1
Subtotal Province	**10**	**50%**	**2**	**8**	**10**
District					
District Health Manager	1	10%	-	1	1
Officer In-Charge	1	50%		1	1
Disease Control Officer	1	10%		1	1
Nursing Officer	2	100%	2		2
Health Extension Officer	1	50%		1	1
Community Health Worker	4	100%	4		4
Cold Chain Logistic Officer	1	100%	1		1
Ancillary	2	20%		2	2
Driver	1	30%		1	1
Subtotal District	**14**	**52%**	**7**	**7**	**14**
Health facility					
Officer In-charge	1	50%	-	1	1
MCH Incharge	1	100%	1		1
Community Health Worker	3	100%	3		3
Driver	1	50%		1	1
Subtotal HF	**6**	**75%**	**4**	**2**	**6**
Grand Total	**39**		**18**	**21**	**39**

Annex 8: Personnel

	2014	2016	2017	2018	2019	2020	Total 2016-2020	
Salaries of full-time EPI health workers (immunization specific)	112,371	112,371	126,449	126,449	126,449	126,449	**618,166**	50%
Per-diems for outreach vaccinators/mobile teams	6,068	6,068	26,829	26,829	26,829	26,829	**113,384**	9%
Per-diems for supervision and monitoring	65,202	65,202	45,308	45,308	45,308	45,308	**246,433**	20%
Shared Personnel Costs	58,314	58,314	49,023	49,023	49,023	49,023	**312,720**	25%
Total	**241,956**	**241,956**	**247,608**	**247,608**	**247,608**	**247,608**	**1,232,390**	100%

Annex 9: Total Resource Requirements, funding from all sources by risk types and government financing by cost categories

Cost category	Future resource requirements Total 2016-2020	Funding from all sources			WHO					
		Secured	Probable	Total	Secured	% of All secured funds	Probable	% of all probable funds	Total	% of Total funds
Routine recurrent costs										
Vaccines (routine vaccines only)	**52,052,905**	**42,211,546**	**1,500,111**	**43,711,657**	**0**	**0%**	**0**	**0%**	**0**	**0%**
Traditional	**2,085,198**	1,643,821	1,500,111	3,143,932	0	0%	0	0%	0	0%
Underused	**36,710,811**	37,428,981	0	37,428,981	0	0%	0		0	0%
New	**13,256,897**	3,138,743	0	3,138,743	0	0%	0		0	0%
Injection supplies	**1,559,010**	210,997	970,975	1,181,972	0	0%	0	0%	0	0%
Personnel	**977,984**	**491,717**	**215,544**	**707,261**	**0**	**0%**	**144,274**	**67%**	**144,274**	**20%**
Salaries of full-time EPI health workers (immunization specific)	**618,166**	491,717	0	491,717	0	0%	0		0	0%
Per-diems for outreach vaccinators/mobile teams	**113,384**	0	59,726	59,726	0		53,658	90%	53,658	90%
Per-diems for supervision and monitoring	**246,433**	0	155,817	155,817	0		90,616	58%	90,616	58%
Transportation	**10,353,535**	**0**	**5,921,682**	**5,921,682**	**0**		**5,921,682**	**100%**	**5,921,682**	**100%**
Fixed Site Strategy (Incl. Vaccine Distribution)	**10,353,535**	0	4,141,414	4,141,414	0		4,141,414	100%	4,141,414	100%
Outreach strategy + Mobile strategy	**0**	0	1,780,267	1,780,267	0		1,780,267	100%	1,780,267	100%
Maintenance and overhead	**2,898,066**	**99,506**	**653,704**	**753,210**	0	0%	0	0%	0	0%
Cold chain maintenance and overhead	**2,652,889**	0	508,240	508,240	0		0	0%	0	0%
Maintenance of other capital equipment	**245,177**	99,506	145,464	244,970	0	0%	0	0%	0	0%
Building Overheads (Electricity, Water…)				0	0		0		0	
Short-term training	**5,060,832**	0	0	0	0		0		0	
IEC/Social Mobilization	**530,812**	775,000	0	775,000	25,000	3%	0		25,000	3%
Disease Surveillance	**265,406**	402,070	1,500,000	1,902,070	402,070	100%	1,500,000	100%	1,902,071	100%
Program management	**106,162**	1,957,070	3,540,000	5,497,070	1,207,070	62%	3,540,000	100%	4,747,071	86%
Other routine recurrent costs				0	0		0		0	
Subtotal	**73,804,712**	**46,147,906**	**14,302,015**	**60,449,922**	**1,634,140**	**4%**	**11,105,955**	**78%**	**12,740,095**	**21%**
Routine capital costs										
Vehicles (100% EPI)				0	0		0		0	
Cold chain equipment	**13,154,587**	0	0	0	0		0		0	

Other capital equipment	**446,692**	0	0	0	0		0		0	
Buildings Construction (100% EPI)				0	0		0		0	
Subtotal	**13,601,279**	**0**	**0**	**0**	**0**		**0**		**0**	
Supplemental immunization activities (SIAs)										
MR Campaign in low performing districts	**797,530**	**0**	**304,761**	**304,761**	**304,761**		**4**	**0%**	**304,765**	**100%**
Vaccines & injection supplies	**473,855**	0	0	0	0		0		0	
Operational costs	**323,674**	0	304,761	304,761	304,761		4	0%	304,765	100%
TT Campaign in high and medium risk districts	**4,671,564**	**0**	**3,629,283**	**3,629,283**	**3,629,283**		**4**	**0%**	**3,629,287**	**100%**
Vaccines & injection supplies	**817,057**	0	0	0	0		0		0	
Operational costs	**3,854,507**	0	3,629,283	3,629,283	3,629,283		4	0%	3,629,287	100%
Subtotal	**5,469,094**	**0**	**3,934,045**	**3,934,045**	**3,934,045**		**8**	**0%**	**3,934,053**	**100%**
Shared Health Systems Costs (EPI Portion)										
Shared Personnel Costs	**254,406**	**254,406**	**0**	**254,406**	**0**	**0%**	**0**		**0**	**0%**
Shared Transport Costs – Vehicles, Fuel and Maintenance	**217,968**	217,968	0	217,968	0	0%	0		0	0%
Shared buildings - construction				0	0		0		0	
Shared Buildings – Overhead				0	0		0		0	
Subtotal	**472,373**	**472,373**	**0**	**472,373**	**0**	**0%**	**0**		**0**	**0%**
Grand Total	**93,347,458**	**46,620,280**	**18,236,060**	**64,856,340**	**5,568,185**	**12%**	**11,105,963**	**61%**	**16,674,148**	**26%**
Routine Immunization	**87,878,365**	46,620,280	14,302,015	60,922,295	1,634,140	4%	11,105,955	78%	12,740,095	21%
Supplemental immunization activities	**5,469,094**	0	3,934,045	3,934,045	3,934,045		8	0%	3,934,053	100%

Annex 10: Financing by sources, years and types of funds (including shared system costs)

	2016	2017	2018	2019	2020	Total
Secured funding						
Government	2,685,360	159,686	192,717	126,449	-	**3,164,212**
Sub-national government	-	-	-	-	-	**-**
Gov. co-financing of gavi vaccine	682,558	1,903,851	3,638,930	5,815,916	7,969,507	**20,010,762**
WHO	817,070	817,070	-	-	-	**1,634,140**
UNICEF	700,000	800,000	-	-	-	**1,500,000**
DFAT	-	-	-	-	-	**-**
GAVI NVS	5,993,262	4,725,810	4,174,966	3,217,816	1,726,937	**19,838,792**
Subtotal secure funding	**10,878,250**	**8,406,417**	**8,006,613**	**9,160,181**	**9,696,444**	**46,147,906**
Probable funding						
Government	71,270	1,012,287	576,216	743,361	792,926	**3,196,060**
Sub-national government	-	-	-	-	-	**-**
Gov. co-financing of gavi vaccine	-	-	-	-	-	**-**
WHO	-	-	6,680,000	1,680,000	6,680,000	**15,040,000**
UNICEF	-	-	-	-	-	**-**
DFAT	-	-	-	-	-	**-**
GAVI NVS	-	-	-	-	-	**-**
Subtotal probable funding	**71,270**	**1,012,287**	**7,256,216**	**2,423,361**	**7,472,926**	**18,236,060**
Total (secured and probable funding)						
Government	2,756,630	1,171,974	768,932	869,810	792,926	**6,360,272**
Sub-national government	-	-	-	-	-	**-**
Gov. co-financing of gavi vaccine	682,558	1,903,851	3,638,930	5,815,916	7,969,507	**20,010,762**
WHO	817,070	817,070	6,680,000	1,680,000	6,680,000	**16,674,140**
UNICEF	700,000	800,000	-	-	-	**1,500,000**
DFAT	-	-	-	-	-	**-**
GAVI NVS	5,993,262	4,725,810	4,174,966	3,217,816	1,726,937	**19,838,792**
Total funding	**10,949,520**	**9,418,705**	**15,262,829**	**11,583,542**	**17,169,371**	**64,383,966**

Annex 11: Macroeconomic and sustainability indicators

	2014	2016	2017	2018	2019	2020
Macroeconomic projections						
Population	7,275,324	8,475,116	8,737,845	9,008,718	9,287,988	9,575,916
GDP ($)	16,087,822,107	16,729,879,533	18,305,785,030	19,440,813,604	21,018,717,601	22,694,920,856
Per capita GDP ($)	2,211	1,974	2,095	2,158	2,263	2,370
Total Health Expenditures (THE $)	671,935,768	782,746,413	807,011,552	832,028,910	857,821,807	884,414,283
Total Health Expenditures (THE) per capita	92	92	92	92	92	92
Government Health Expenditures (GHE $)	546,149,392	636,216,285	655,938,990	676,273,098	697,237,564	718,851,929
Government Health Expenditure per capita ($)	75	75	75	75	75	75
Resource requirements for immunization						
Routine and SIAS (Campaigns) includesvaccines and operational costs)	7,646,029	12,393,940	16,296,927	21,259,507	22,051,361	20,873,350
Routine only (includes vaccines and operational costs)	7,646,029	12,393,940	16,296,927	18,649,719	22,051,361	18,014,045
Per DTP3 immunized child	56	57	73	76	88	66
Per capita						
Routine and SIAS (Campaigns) includesvaccines and operational costs)	1.05	1.46	1.87	2.36	2.37	2.18
Routine only (includes vaccines and operational costs)	1.05	1.46	1.87	2.07	2.37	1.88
% Government Health Expenditures						
Routine and SIAS (Campaigns) includesvaccines and operational costs)	1.40%	1.95%	2.48%	3.14%	3.16%	2.90%
Routine only (includes vaccines and operational costs)	1.40%	1.95%	2.48%	2.76%	3.16%	2.51%
% Of Total Health Expenditures (THE)						
Routine and SIAS (Campaigns) includesvaccines and operational costs)	1.14%	1.58%	2.02%	2.56%	2.57%	2.36%
Routine only (includes vaccines and operational costs)	1.14%	1.58%	2.02%	2.24%	2.57%	2.04%
% GDP						
Routine and SIAS (Campaigns) includesvaccines and operational costs)	0.05%	0.07%	0.09%	0.11%	0.10%	0.09%
Routine only (includes vaccines and operational costs)	0.05%	0.07%	0.09%	0.10%	0.10%	0.08%
Funding gap						
Funding gap (with secured funds only)		1,515,690	7,890,510	13,252,894	12,891,180	11,176,905
% of the future resource requirements for immunization		12%	48%	62%	58%	54%
% Government Health Expenditures		0.24%	1.20%	1.96%	1.85%	1.55%
% Of Total Health Expenditures (THE)		0.19%	0.98%	1.59%	1.50%	1.26%

	2014	2016	2017	2018	2019	2020
Macroeconomic projections						
% GDP		0.01%	0.04%	0.07%	0.06%	0.05%
Funding gap (with secured & probable funds)		1,444,420	6,878,222	5,996,678	10,467,819	3,703,979
% of the future resource requirements for immunization		12%	42%	28%	47%	18%
% Government Health Expenditures		0.23%	1.05%	0.89%	1.50%	0.52%
% Of Total Health Expenditures (THE)		0.18%	0.85%	0.72%	1.22%	0.42%
% GDP		0.01%	0.04%	0.03%	0.05%	0.02%