A Comprehensive Multi Year Plan 2016 - 2020

The national immunization program in Timor-Leste

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Acronyms

AD	Auto-destruct
AEFI	Adverse Events Following Immunization
AFP	Acute Flaccid Paralysis
ANC	Ante Natal Care
BCC	Behavior Change Communication
BCG	Bacillus Calmette-Guerin
cMYP	Comprehensive Multi-Year Plan
CHC	Community Health Center
CPI	Consumer Price Index
CSOs	Civil Society Organizations
CSR	Communicable Disease Surveillance and Response
DEWS	Disease Early Warning System
DHIS	District Health Information System
DHO	District Health Office
DHS	Demographic and Health Survey
DPT	Diphtheria Tetanus Pertussis
DQS	Data Quality Self-Assessment
DT	Diphtheria Tetanus
EDL	Essential Drug List
ENT	Ear Nose Throat
EPI	Expanded Program on Immunization
FHW	Female Health Worker
FIC	Fully Immunized Children
EVM	Effective Vaccine Management
GAVI	Global Alliance for Vaccines and Immunization
GAVI HSS	GAVI Health System Strengthening
GAVI ISS	GAVI Immunization Services Support
GAVI NVS	GAVI New Vaccine Support
GDP	Gross Domestic Product
GGHE	General Government Health Expenditure
GHE	Government Health Expenditure
GoTL	Government of Timor-Leste
GVAP	Global Vaccine Action Plan

HDI	Human Development Index
Hep-B	Hepatitis-B
HIS	Health Information System
HMIS	Health Management Information System
HP	Health Post
HR	Human Resources
HPV	Human Papilloma Virus
HSCC	Health Sector Coordination Committee
HSS	Health Systems Strengthening
HSSP	Health Sector Strategic Plan
ICC	Inter-agency Coordinating Committee
ICS	Immunization-system-component-specific
IEC	Information, Education and Communication
ILR	Ice-Lined Refrigerator
INGO	International Non-Governmental Organization
IP	Immunization Practices
IPV	Inactivated Polio Vaccine
KAP	Knowledge, Attitude and Practice
KM	Kilometer
LMICs	Low-Middle-Income Countries
M&E	Monitoring and Evaluation
MGD	Millennium Development Goals
MHO	Municipality Health Office
MHT	Mobile Health Teams
MICS	Multiple Indicator Cluster Survey
MMR	Maternal Mortality Ratio
MNCH	Maternal, Neonatal and Child Health
MNT	Maternal and Neonatal Tetanus
MoF	Ministry of Finance
MoH	Ministry of Health
MR	Measles Rubella
MSDS	Minimum Service Delivery Standards
MTBF	Medium Term Budget Framework
NCCPE	National Certification Committee for Polio Eradication

NCIP	National Committee on Immunization Practice
NGO	Non-Governmental Organization
NHA	National Health Accounts
NHSSP	National Health Sector Strategic Plan
NITAG	National Immunization Technical Advisory Group
OOP	Out of Pocket
OPD	Out-Patient-Department
OPV	Oral Polio Vaccine
PCV-13	Pneumococcal Conjugate Vaccine – 13
PEI	Polio Eradication Initiative
Penta	Pentavalent (DPT-HepB-Hib)
PHC	Primary Health Care
PIRI	Periodic Intensified Routine Immunization
PoA	Plan of Action
POL	Petrol Oil Lubricants
REC	Reaching Every Community
RED	Reaching Every District
RHO	Regional Health Officer
RI	Routine Immunization
RMNCH	Reproductive, Maternal, Neonatal and Child Health Services
RTMD	Remote Temperature Monitoring Device
SAMES	Servico De Medicamentos e Equipmanetos de Saude
SDP	Strategic Development Plan
SIA	Supplementary Immunization Activity
SIS	Skilled Immunization Staff
SISCa	Servisu Integradu Saude Comunitaria
SOPs	Standard Operating Procedures
SWOT	Strengths, Weaknesses, Opportunities and Threats
TAG	Technical Advisory Group
THE	Total Health Expenditure
TOT	Training of Trainers
TT	Tetanus Toxoid
UNDP	United Nations Development Funds
UNFPA	United Nations Population Fund

UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
USD	United States Dollar
VPD	Vaccine Preventable Disease
WHO	World Health Organization

Executive Summary

Immunization Situation Analysis: Summary 2011-2015

Immunization Achievements

- Polio Free Status
- Maternal and Neonatal Tetanus eliminated
- Introduction of Hepatitis-B birth dose and IPV vaccines
- EPI Policy developed and endorsed
- Cold Chain Policy developed and endorsed

Immunization Coverage

- Penta-3: 77% (2014, WHO/UNICEF Estimates)
- MR-1: 74% (2014, WHO/UNICEF Estimates)
- TT2+: 81% (2014, WHO/UNICEF Estimates)
- % Drop Out Penta1 – Penta3: 4.9%
- % Drop Out BCG – MR 1: 6.2%

Immunization System Analysis

- Significant increase in health posts
- Significant increase in number of doctors but with limited EPI experience and training
- Insufficient microplanning and tracing
- Insufficient supervision due to lack of trained personnel with EPI focus at district level
- Lack of validation of data in field
- Significantly weak cold chain maintenance

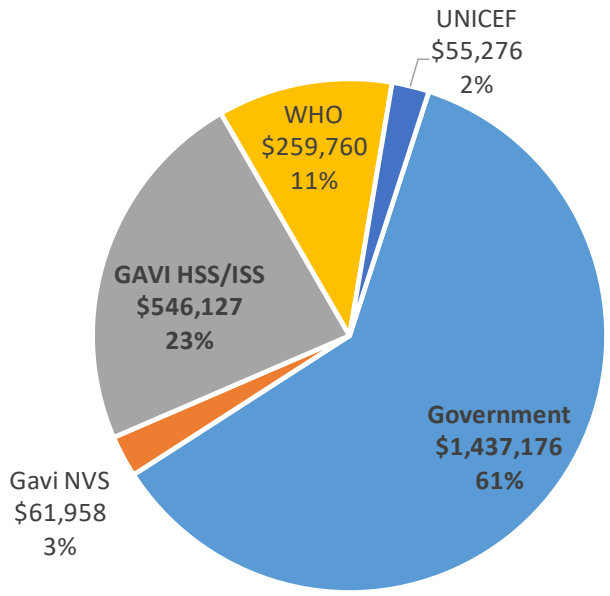
Health System Constraints

- Inequities in immunization coverage
- Low financial stability from 2018 onwards
- Availability of health workforce well below the threshold level
- Entire population not covered under PHC system
- Reduced support from donors

Baseline Costing Profile

Baseline Indicators	2014
Total Immunization Specific Expenditures	**$1,610,984**
Supplemental immunization activities	$0
Routine immunization only	$1,610,984
Per capita	$1.38
Per DTP3 immunized child	$54
% Vaccines and Supplies	25.66%
% Government Funding	39.69%
% Of Total Health Expenditures (THE)	2.34%
% Government Health Expenditures	2.56%
% GDP	0.12%
Total shared costs	**$749,313**
% Shared Health Systems Cost	31.75%
Total Immunization Expenditures	**$2,360,297**

Baseline Financing Profile



cMYP Summary: 2016-2020

National Immunization Priorities

- Increasing immunization coverage and reducing vaccine-preventable diseases
- Sustaining Polio free status
- Sustain MNT elimination
- Eliminate Measles
- Improving quality, efficiency and sustainability of immunization program
- Changing political and public awareness of and attitudes toward importance of immunization
- New vaccine introduction (DT, Rota)

Immunization Priority Objectives

- Increase control of VPD diseases
- Improve surveillance of VPD diseases and AEFI
- Improve effective management in accordance with the EVM improvement plan
- Improve routine data collection and reporting (through integration into DHIS2)
- Improve micro-planning, monitoring and reporting of immunization services
- Increase sustainability of immunization financing

National Program Monitoring Framework

Indicator	2014	2020
BCG	79%	95%
Penta-3	77%	95%
OPV-3	76%	95%
IPV	n/a	95%
Rota	n/a	80%
Measles-Rubella-1	74%	95%
Tetanus Toxoid	81%	90%
Fully Immunized Children <1 Yr	57.9%	95%
Penta1-Penta3 Dropout Rate	4.9%	0%

Priority Immunization Program Strategies

- Improve performance by strengthening the leadership capacity of Ministry of Health in immunization service delivery
- Improve immunization delivery through:
  - Increasing skilled immunization staff
  - Ensuring micro-planning in health facilities
  - Establishing Centers of Excellence as sub-national training sites
  - Increase in number and performance/efficiency of EPI Centers
- Upgrade cold chain and logistic system
- Increase sustainability of immunization through improved planning and budgeting
- Increase political and public awareness through evidence based advocacy, communication and social mobilization activities

Major risks and challenges

- Economic growth reliance on oil and gas
- Substantial weaknesses in program management and HR capacity
- 30% population does not come to public health facilities
- High level of integration within MCH & Health may sideline immunization
- Low Human Development Index

Health and Development Impacts

- Reduced morbidity and disability in the community associated with VPD
- Contribution health expenditure savings through reduced hospital burden of VPD (diarrhea, measles)
- Use of immunization as a strategic component of poverty reduction initiatives through improved child survival

Cost and Financing projections

	2016	2017	2018	2019	2020	Total
Total resources required (million US$)	**2,893**	**3,116**	**4,868**	**2,635**	**2,725**	**16,237**
Cost per capita	*1.8*	*1.9*	*3.3*	*1.4*	*1.4*	
Total secure financing (million US$)	571	1,285	3,246	1,741	1,792	**8,635**
Funding Gap (with secure) (million US$)	**2,322**	**1,831**	**1,623**	**894**	**932**	**7,602**
Total secure and probable financing (million US$)	2,893	3,116	4,868	2,635	2,725	**16,237**
Gap (with secure + probable financing)(million US$)	**0**	**0**	**0**	**0**	**0**	**0**
Funding gap % of total need	0%	0%	0%	0%	0%	**0%**

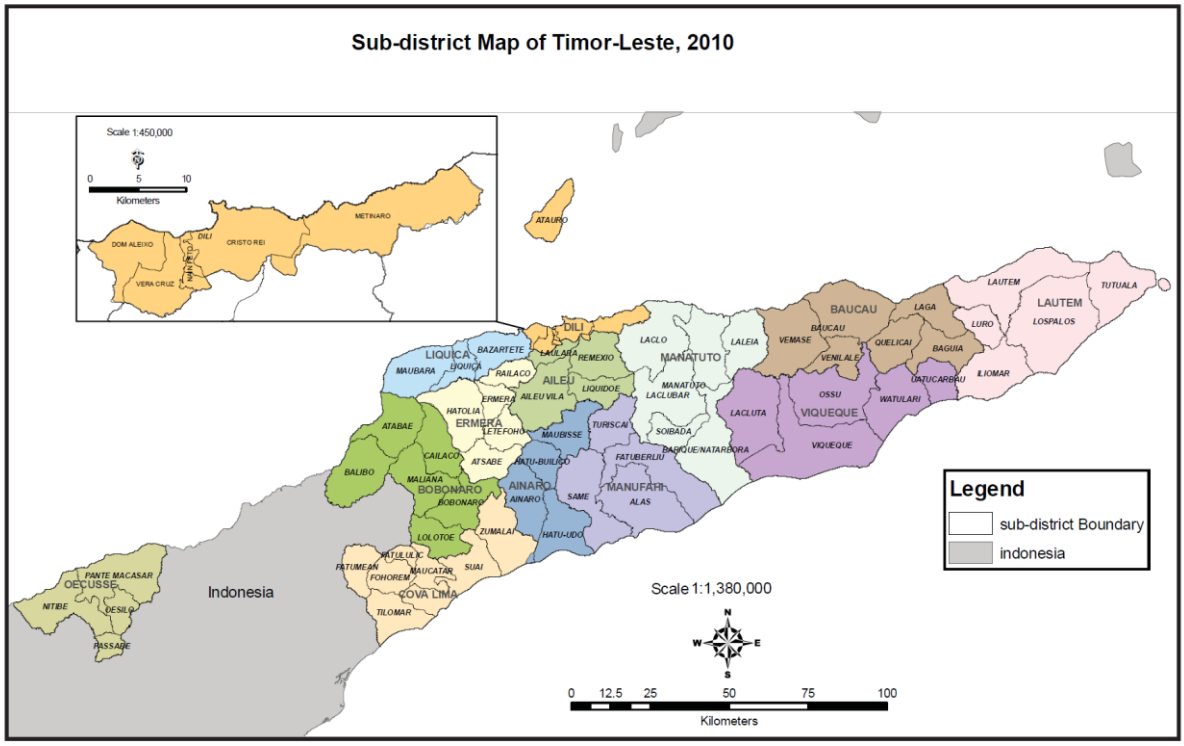
1 Situational Analysis

1.1 Background information

1.1.1 Landscape and climate

Timor-Leste is situation in the northwest of Australia and in the Lesser Sunda Islands at the eastern end of the Indonesian archipelago. It borders with Indonesia and occupies territory of 14,874 sq. km.

The country has 706 km coastline and terrain is mountainous. Climate is tropical with distinct rainy (November to April) and dry seasons.



1.1.2 Administrative and political structure

After nearly 400 years as Portuguese colony, Timor-Leste unilaterally declared independence from Portugal on 28 November 1975. The country was annexed by Indonesia (as Tim Tim Province) before international recognition of independence. Pressure against occupation and a changing political and economic climate led to a revolt for independence on 30 August 1999 but conflict ensued due to response of Indonesian military. United Nations Transitional Administration was established on 25 October 1999 and three years later, on 20 May 2002 Democratic Republic of Timor-Leste became a sovereign state.

Administratively, the country is divided into 13 municipalities, 65 administrative Postos[1], 442 villages (Sucos), and 2,228 hamlets (Aldeias). The municipality of Oecusse is an enclave located inside West Timor of Indonesia and accessible primarily by sea or air. According to the preliminary results of the Population and Housing Census 2015, 71.8% of the population is rural with most people living in small scattered villages often isolated by mountainous terrain. Dili, the Capital, is the largest city

[1] Also known as sub-districts

contribution to 67.7% of the total urban population. Although work on infrastructure (roads, electricity) is going on in Timor-Leste, the access to the mountain areas is still difficult with roads in poor condition.

1.1.3 Demography

In 2015, the total population was 1,167,242.[2] The population annual growth rate has decreased from 2.41% in 2005-2010 to 1.81% in 2011-2015. The share of rural population has slight increased from 71% in 2010 to 71.8% in 2015. been decreasing steadily but remains high (71.8% in 2015). The sex ratio is 102 (for every 100 women in Timor-Leste there are 102 men). The average household size is 5.7 (ranging from 4.6 in Oecusse to 6.4 in Dili. The majority of population lives in the northern half of the country (divided from the southern half by mountains) and is dispersed in hard to reach mountainous areas.

	2010	2015
YEAR OF LAST CENSUS	2010	2015
POPULATION	1,066,409	1,167,242
POPULATION GROWTH	2.41%	1.81%
LIVE BIRTHS	47,385	
CHILDREN (0-14) (%)	41.4	
% RURAL	71%	71.8%

1.1.4 Economic and social context

Since its independence, Timor-Leste has faced great challenges in rebuilding its infrastructure, strengthening the civil administration, and generating jobs for young people entering the work force. The development of oil and gas resources in offshore waters has greatly supplemented government revenues. A Petroleum Fund established in 2005 to serve as a repository for all petroleum revenues held assets of 16.6 US$ billion as of September 2014. On the strength of its oil-wealth, the economy has achieved real growth between 8-12% per year for the last several years (2007-2012), among the highest sustained growth rates in the world.

Gross domestic product (GDP) per capita doubled from 518 US$ in 2001 to 1,169 US$ in 2014; Gross national income per capita experiences even steeper increase from 810 US$ in 2002 to 2,680 US$ in 2014.[3]

Annual inflation rate (GDP deflator) has remained single digit since 2001 while Consumer Price Index (CPI) increased from 0.67% in 2009 to 11.16% in 2013. International Monitory Fund (IMF) estimated annual inflation (CPI) at 2.5% in 2014 and 2.4% in 2015.

1.2 Health Sector Analysis

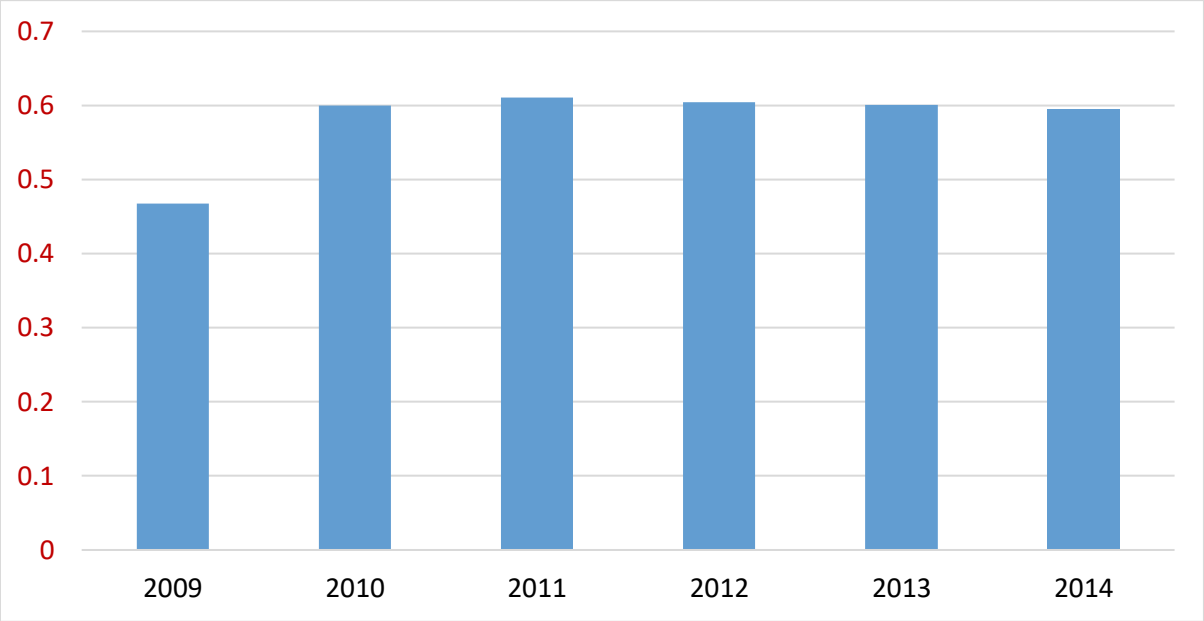
1.2.1 Social and Health systems development and outcomes

Despite efforts by the Government of Timor-Leste and development partners, a rapid economic growth since 2006 has not translated into human development outcomes:

[2] Population and Housing Census 2015: preliminary results
[3] World Development Indicators 2014, World Bank

- Timor-Leste ranks 133 out of 187 countries on the Human Development Index for 2014 (HDI 0.595, slight lower than 0.620 in 2013)[4]
- Progress toward the MDGs is mixed:
  - Likely to meet MDGs: #2 (achieve universal primary education), #3 (promote gender equality and empower women), and #4 (reduce child mortality)
  - Might not meet MDGs: #1 (eradicate extreme poverty and hunger), #5 (improve maternal health), #6 (combat HIV/AIDS, Malaria and other Diseases) and #7 (ensure environmental sustainability).

Figure 1: Human Development Index (HDI) by years



Source: UNDP[5]

Life expectancy at birth has increased from 61.1 years in 2002 to 68.2 years in 2014.[6] According to UNDP, 694 thousand or a half of the population was in multidimensional poverty (in 2009/10) or below the national poverty line, while 31.5% of populations lived in severe poverty. Poverty situation in 2007 is presented in details in Figure 2 below).

Figure 2: Poverty in Timor-Leste in 2007, WDI

Poverty indicators	Values
Poverty headcount ratio at $2 a day (PPP) (% of population)	71.06
Poverty headcount ratio at $1.25 a day (PPP) (% of population)	34.87
Poverty gap at $2 a day (PPP) (%)	25.68
Poverty gap at $1.25 a day (PPP) (%)	8.14
Poverty gap at national poverty lines (%)	13.6

[4] Human Development Report 2014, UNDP
[5] http://hdr.undp.org/en/composite/trends
[6] Human Development Report 2015, UNDP

Poverty headcount ratio at national poverty lines (% of population)	49.9
Rural poverty gap at national poverty lines (%)	14.2
Rural poverty headcount ratio at national poverty lines (% of rural population)	51.5
Urban poverty gap at national poverty lines (%)	11.8
Urban poverty headcount ratio at national poverty lines (% of urban population)	45.2

According to the World Health Statistics 2015, maternal mortality ratio declined from 680 per 100,000 live births in 2000 to 270 in 2013 whereas during the same time period, under-five child mortality fell from 106.6 per 1,000 live births to 54.6.

According to the cMYP (2011-2015), the country aimed at decreasing under-5 mortality rate from 83 (in FY 2010/2011) to 55 per 1,000 (in FY 2014/2015) and infant mortality rate from 60 to 42 in the same period.

Figure 3: Content of "Basic Service package for child survival"

- Skilled attendance during pregnancy, delivery and the immediate postpartum
- Antenatal Care
- Essential Newborn Care
- Care of Sick and Small babies
- Improved nutrition of children and mothers including micronutrient supplementation
- Breastfeeding and complementary feeding
- Treatment of Children with Severe Malnutrition
- ***Immunization of children and mothers***
- Integrated management of pneumonia, diarrhea (including ORT) and malaria
- Insecticide treated bed nets

The Ministry of Health National Health Sector Strategic Plan (NHSSP) 2011-2030 is linked to the government's Strategic Development Plan (SDP) 2011-2030. The SDP aims at "transition Timor-Leste from a low income to upper middle income country, with a healthy, well-educated and safe population by 2030". The SDP is aligned with the MDGs and clearly states that "the Timor-Leste Constitution imbeds medical care as a fundamental right for all citizens and imposes a duty on the government to promote a national health system that is universal, general, free of charge, as far as possible, decentralized and participatory.

1.2.2 Health system context

The health sector consists of four organizational levels of services:

- Central services
- Municipality health services
- Sub-district health services, and
- Community health services.

National health system organizational structure is illustrated in Figure 4 (on page 5). Within this health sector organizational hierarchy, the health service delivery is provided at four levels; all working under the direction of Municipality Health Services:

Level 1: Health Posts (HP) and mobile clinics are the front-line health facilities within a range of 4-8 km that provide basic health services, including health education, growth monitoring, immunization, basic MCH services, health promotional activities, simple curative/rehabilitative services. Mobile clinics manned by a midwife, nurse, administrator and a driver. Each team is

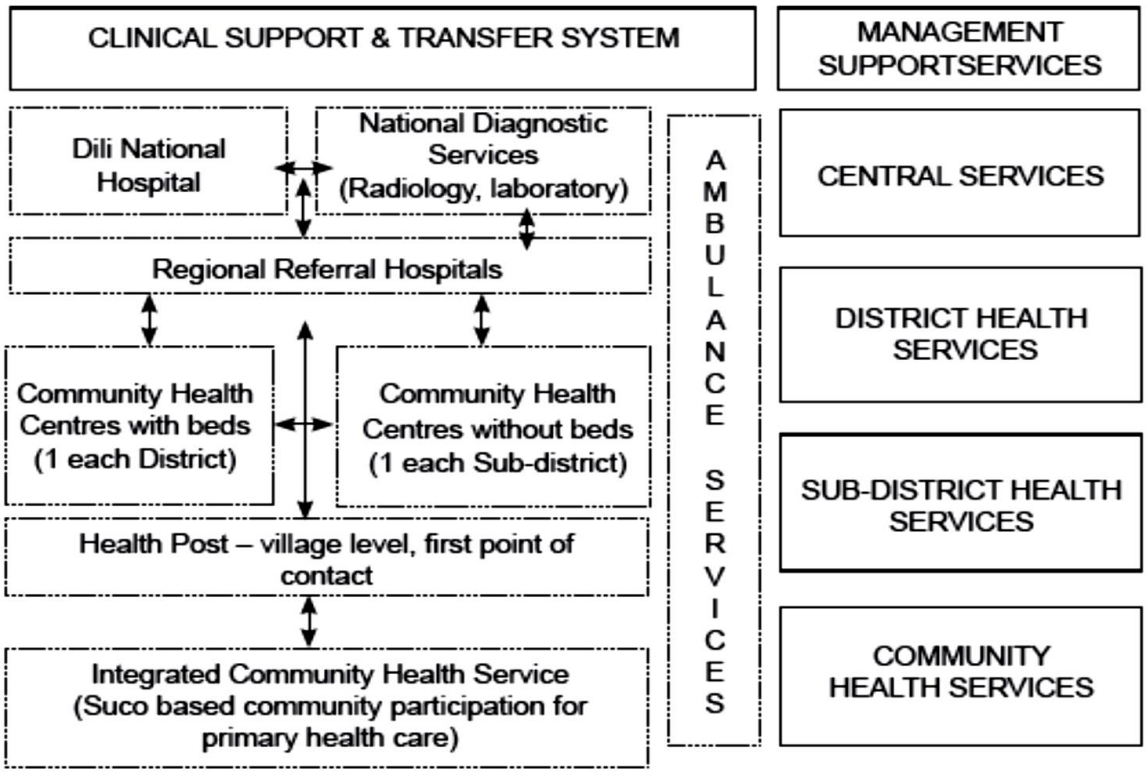
expected to conduct weekly visits to four remote locations identified with community involvement.[7] The health post (HP) is assisted by SISCa (Servisu Integradu Saude Comunitaria/integrated community health services) in order to reach communities in rural/remote areas. There were 241 HPs in the country. The Government of Timor-Leste (GoTL) plans to build an HP in every suco, or 442 HPs by 2030.

Level 2: Community Health Centers (CHCs) in every sub-district provide promotive, preventive, and curative services, including out-patient consultations supported by a simple laboratory.

Level 3: CHCs with beds, which also function as maternity clinics that provide basic emergency obstetric care (e.g. manual removal of placenta, forceps/vacuum-assisted delivery or treatment of other obstetric complications). In total, there are 69 functional CHCs providing health services in 2015.

Level 4: Municipality referral hospitals are characterized by availability of inpatient care, complete laboratory services and other diagnostic facilities. In 2015, there were five district referral hospitals and a national hospital, which has linkages with overseas health care facilities for tertiary care.

Figure 4: Current National Health System configuration (2013)

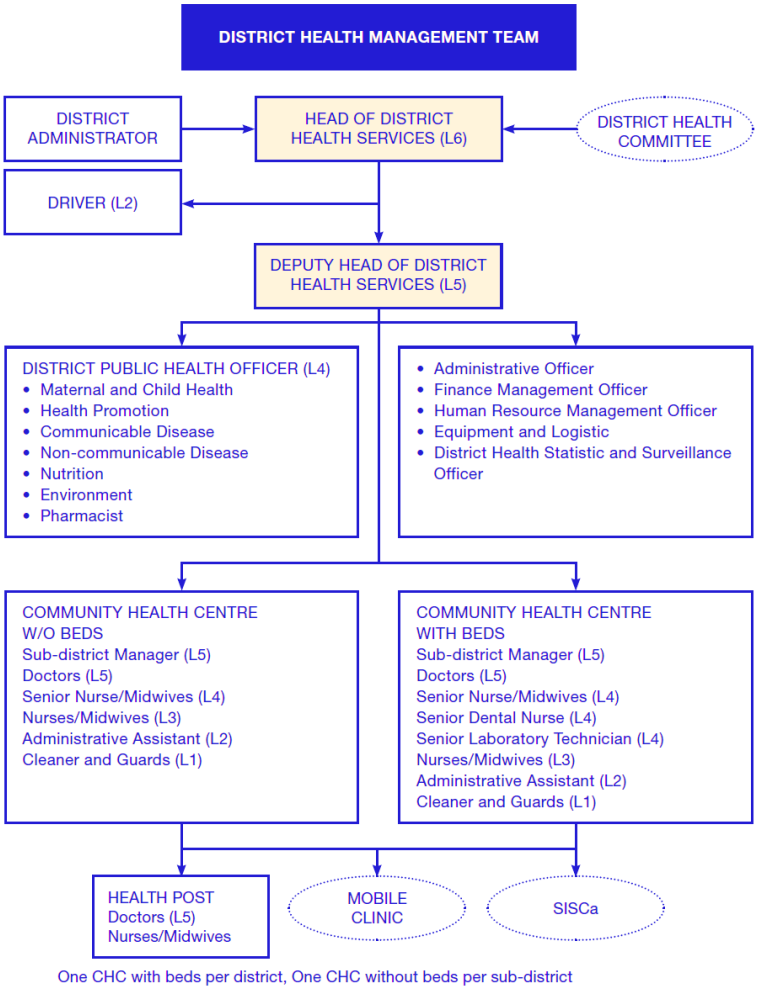


At the municipality level, health services are managed by the Municipality/District Health Office (DHO/MHO) (Figure 5). The municipality health services with the Central services are in charge of implementing public health programs (see the content of "Basic Service Package for Child Survival" in Figure 3 above) including immunization.

[7] National Reproductive, Maternal, Neonatal and Child Health (RMNCH) Strategy 2015-2019

Recently, in the last quarter of 2015, the Ministry of Health (MoH) has started a process of decentralizing administrative and fiscal powers to the Municipality Health Office. Therefore, it is expected the organizational and administrative setup at the municipality level will be reorganized.

Figure 5: Organizational structure of municipality health services



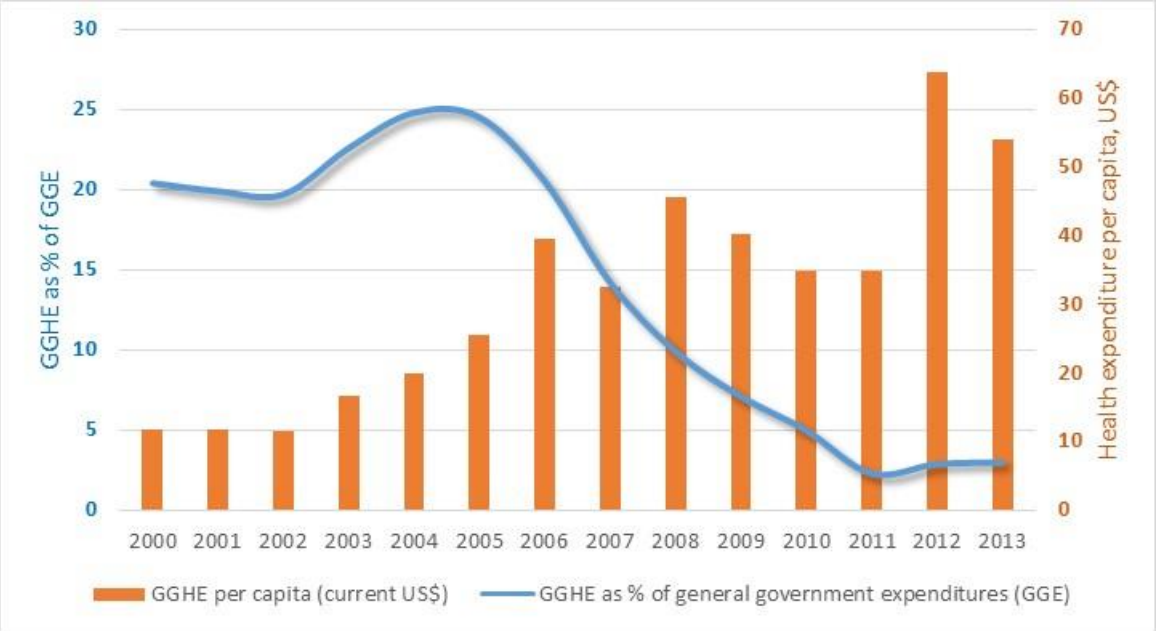
Despite the growth in economy, as reflected by doubling of GDP per capita in 2014, the General Government Health Expenditure (GGHE) as a proportion of General Government Expenditure (GGE) has substantially declined from 24.5% in 2005 to 3% in 2013 (Figure 6).[8] However, the contribution of GGHE as percentage of Total Health Expenditure (THE) remained very high during this period, more than 90%. The out-of-pocket (OOP) expenditure remain nearly 4% whereas the rest was contributed by the private health sector. Low OOP is an indication that on average, the general population has some protection against the health related catastrophes.[9]

[8] National Health Accounts (NHA) Indicators, World Health Organization

[9] It has to be noted that some basic health financing indicators differ between WHO's National Health Accounts tables and the World Bank's World Development Indicators (Figure 50). These include: share of public expenditures in THE, public health expenditure per capita and THE per capita.

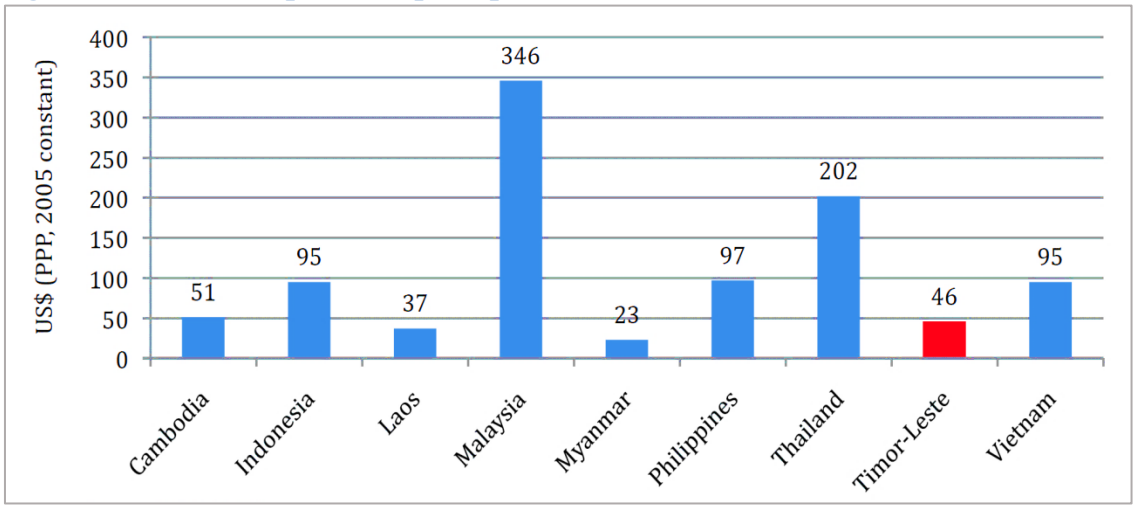
Health financing is progressive in Timor-Leste: the wealthiest 20% cover 74% of total health care payments compared to 39% of consumption of services; health spending among the lowest two quintiles is only 5% while their share of consumption is 22%.

Figure 6: Trends in healthcare financing (WHO NHA indicators)



Compared with other countries in the region, the share of governments financing for health expenditures is high (75.3%), almost similar to Thailand (75.5%) and higher than in Indonesia, Vietnam or Laos (34%, 40% and 49% respectively). However, in terms of Health Expenditure Per Capita, it was US$ PPP 46 per capita; far below Thailand, Philippines, Vietnam and Indonesia (**Error! Reference source not found.**).

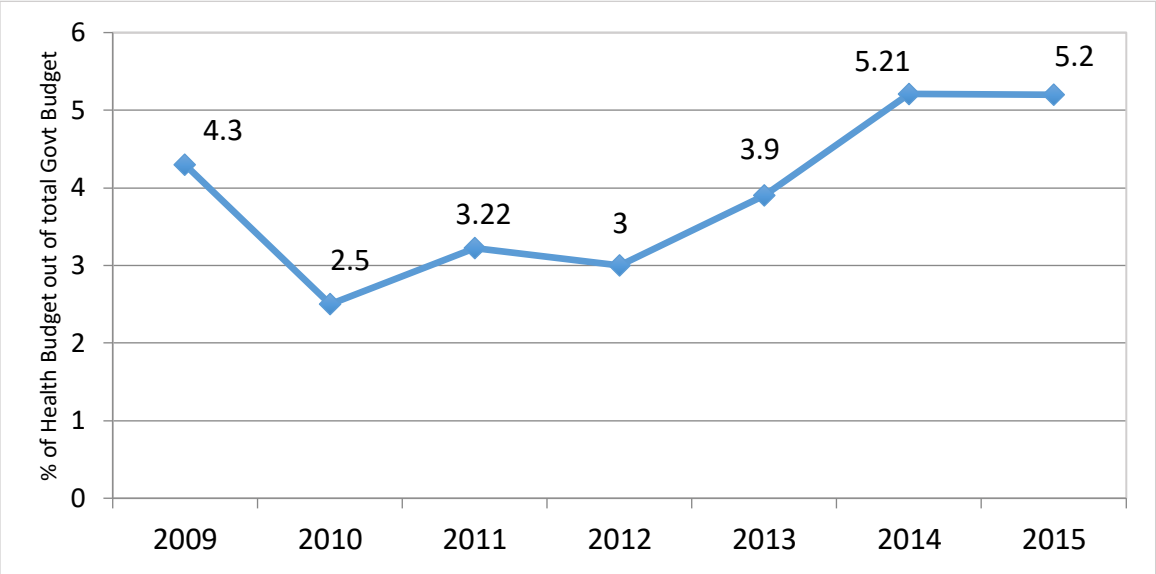
Figure 7: Health expenditure per capita, 2011



Source: World Bank. Timor-Leste Health Equity and Financial Protection Report. 2014. Washington, D.C. (page 8)

In the last two years, 2014 and 2015, the % of health sector budget as a proportion of the total government budget has increased to 5.2% (as shown in Figure 8 below).

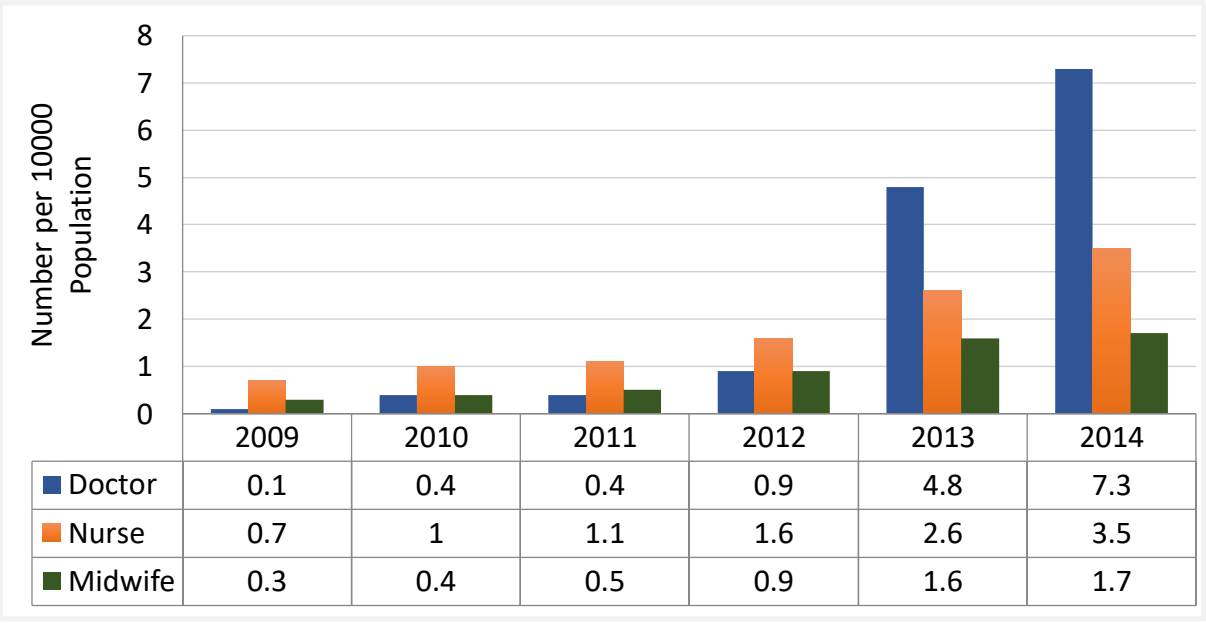
Figure 8: Share of national budget for public health sector



Source: Director General's Annual Review of Health Sector 2015

The major reason for increase in budget for public health sector is the high number of medical doctors who have been recently inducted in the government sector. This shift in policy has significantly improved the physician to population ratio. However, a limited change has been witnessed in the case of availability of nurses and midwives.

Figure 9: Availability of health resources for health (per 10,000 population)



	2009	2010	2011	2012	2013	2014
Doctor	0.1	0.4	0.4	0.9	4.8	7.3
Nurse	0.7	1	1.1	1.6	2.6	3.5
Midwife	0.3	0.4	0.5	0.9	1.6	1.7

Source: Director General's Annual Review of Health Sector 2015

Healthcare facilities in public domain receive funding from MoH and the share of internally generated revenues is insignificant. In addition, it is important to realize that a substantial amount of GGHE comprises donor contribution being channeled through the government financing system. On account of a progressively growing economy, the external financing for health is decreasing with the passage of time. For example, the Global Alliance for Vaccines and Initiatives (GAVI) has gradually reduced its share for vaccine procurement and this support will come cease in 2018.

Financing and budgeting practices possess an important role in the government departments and demands high levels of performance. However, the findings from the Joint National-International Review of EPI and VPD Surveillance in Timor-Leste 2015 indicated that "there is a lack of clarity on budget allocations and "financial flow". As mentioned in recent health system analysis, there is a disconnection between the national health policy/strategy/plan formulation, operation and budgeting processes. "**As a consequence the budget allocation for EPI and VPD surveillance programmes does not reflect programmes priorities and is somehow inadequate**."[10]

The current budget classification and the recording of budget and expenses do not allow tracking expenditure across programs making it difficult to estimate the government spending for different programs especially immunization. There is lack of accountability mechanisms.

1.3 Current key challenges of the health sector in Timor-Leste

Although the level of financial protection of population in health sector is high in Timor-Leste, some key challenges remain:

- Despite high economic growth and classification of Timor-Leste among Low-Middle-Income Countries (LMICs), half of the population lives below poverty line. In addition, the food insecurity and weak infrastructure pose threat to the government's contribution for sustainable health development
- Despite existing of health policies and sector strategic plans, unsatisfactory implementation of sectoral policies and strategies and weak enforcement of existing legislation
- Redundancy or limited interest for policy, especially implementation
- Key resources such as investment, health workers and supplies are poorly allocated and managed
    - The distribution of health workforce across the country is uneven ranging from 54 skilled health worker per 100,000 population in Ermera (in northwest) to 189 per 100,000 population in Dili (the capital).
    - The country planned to address the deficit in skilled health workers by a massive inflow of new doctors in 2013, a large number of them are yet to be trained on immunization practices
    - Management skills, essential for improving the efficiency and effectiveness of service delivery across health sector are extremely weak
- The number of health facilities have increased significantly over years but nearly 30% of population still lives more than 5 kilometers from the nearest health facility
- The referral system is weak and further compromised by shortage of human resources for health and medicines in the existing health facilities
- Low government spending on health makes it difficult to effectively train, recruit, deploy and maintain motivate health care workforce
- A system for supervision, monitoring and evaluation exists but it's execution is weak

[10] Joint National-International Review of EPI and VPD Surveillance in Timor-Leste 2015

- Late release of funds for supervision, insufficient funds and lack of supervision skills resulting into poor supervision and inadequate accountability and transparency
- Lack of transport and communication facilities for health providers to do home visit and referral
- Limited outreach initiatives to reach target groups who do not come to SISCa activities.
- Lack of reward system for those who are posted in remote areas
- Lack of assessment of performance and needs for capacity building of providers to improve coverage and quality of care
- Weak procurement and supply chain management resulting frequent stock-outs and poor stock management at community and district levels (In 2014, 32.6% of CHC and 57% of HPs reported for stock outs of essential medicines)[11]
- Mostly procurement of equipment and support for capacity building is dependent on external funding
- Gaps remain in logistics and supply chain management despite the implementation of a new warehouse management system as S*ervico De Medicamentos e Equipmanetos de Saude* (SAMES, Central Medical Store).
- Almost all the health programs have developed their own service output recording registers. Therefore, there is a heavy burden of reporting for health providers that takes away the time for service delivery
- Lack of data analysis, utilization and feedback mechanisms at all levels.
- Data analysis and its use for planning processes is low
- Inequalities in health outcomes: the poor tend to have worse child health outcomes compared to wealthiest.

1.4 Immunization system

1.4.1 Expanded program on immunization and policy

EPI was established during the time of Indonesian occupation (1975-1999) and provided vaccination with BCG, DTP, OPV and measles. Immunization coverage was initially high (100% for BCG, ~90% for measles, >80% for DTP3), however dropped before Timor-Leste gained independence (BCG - 63.5%, DTP3 - 56% and measles - 51%). Immunization services were re-vitalized during United Nations Transitional Administration in East Timor's period, but damaged service delivery infrastructure limited access to immunization services.

Although the country developed national policies and strategic guidelines for its national EPI by 2008, there was no National Committee on Immunization Practice (NCIP) (despite the key recommendation of the South East Asian Region Immunization Technical Advisory Group). The Ministry of Health

[11] Director General's Annual Review of Health Sector 2015

relied on the Working Group on Immunization and planned to create NCIP. However, an EPI indicated that no details or documented evidence was available on the functioning of NCIP.

According to the National Immunization Strategy 2014, the EPI is aimed at the following target groups:

- All children under 1 year of age (0-11 months)
- All children in 2nd year of life (12 months to 24 months)
- All children at school entry (6 years to 7 years)
- All women of childbearing age (including pregnant women)

It is noteworthy that the National Health Sector Development Plan 2011-2030 (NHSDP) does not mention VPD or EPI in section IV.4 National Priority Health Program, sub-section D. Control of Communicable Diseases (which is devoted to Malaria, HIV, TB, leprosy, lymphatic filariasis and other acute & viral infection diseases). Instead, immunization is mentioned under Child Health program (sub-section B) as one of strategies ("Increase access and quality of immunization services") with 90% coverage targets for Pentavalent and Measles in 2015. This aspect clearly highlights that the GoTL considers immunization as an important component of the PHC package but no more a vertical health program.

1.4.2 Routine Immunization

The current immunization schedule (according to cMYP 2011-2015) is as follows:

Antigen	Age of Administration
BCG	Birth to 1 year
DTP-HepB-Hib (3 doses)	6 weeks or 1st contact after 6 weeks, +1 month, +1 month
OPV (birth dose + 3 doses)	0-2 weeks, 6 weeks or 1st contact after 6 weeks, +1month, +1 month
Measles (1 dose)	9 months
Tetanus Toxoid (TT) (5 doses)	Pregnant women: 1st contact, +1 month, +6 months, +1 year, + 1 year

However, the government plans to expand the existing immunization schedule in 2016, as per the following:

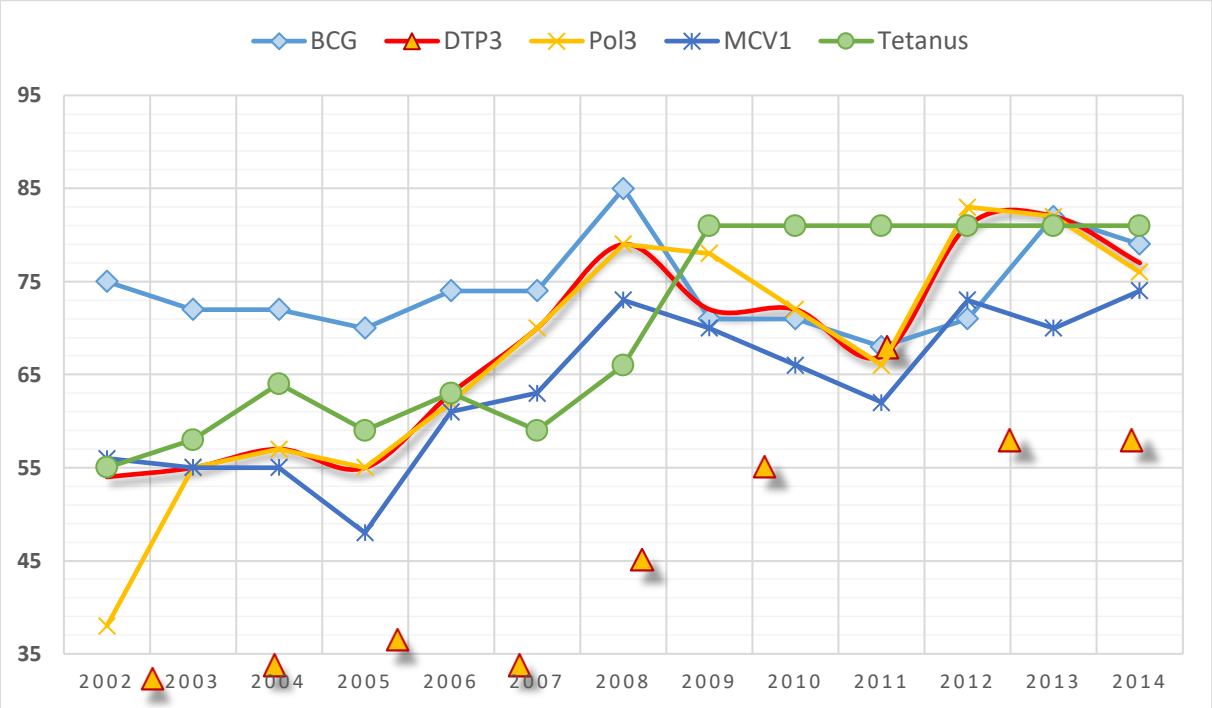
Antigen	Age of Administration
BCG, OPV0, Hep-B zero dose	At birth (or as soon as possible after birth)
OPV1, DTP-HepB-Hib1	At 6 weeks
OPV2, DTP-HepB-Hib2, Rota	At 10 weeks (or 4 weeks after OPV1, DPT-HepB-Hib1)
OPV3, DTP-HepB-Hib3, Rota, IPV	At 14 weeks (or 4 weeks after OPV2, DPT-HepB-Hib2)
MR-1	At 9 months
DTP	At 18 months
MR-2	At 18 Months
DT	At 6 years or school entry
Tetanus Toxoid (TT)	Pregnant women: 1st contact, +1 month, +6 months, +1 year, + 1 year

Key Features:

- In September 2014, GAVI endorsed a funding amounting to 759,949 US$ for the entire duration of the program (2012-2015, Grant number: 1418-TLS-10d-Y); GAVI support of 10 dose per vial liquid DTP-HepB-Hib vaccine amounted to 56,000 US$ in 2014 and 102,000 US$ in 2015.

- GAVI approved IPV support in February 2015 (grant number 1518-TLS-25d-X / 15-TLS-08h-Y), allocating 286,500 US$ for 2015-2017. In addition, in 2015, the GoTL also received 100,000 US$ as introduction grant for launching IPV. n 2015 in addition to IPV and injection supplies worth of 44,500 US$
- Timor-Leste introduced Pentavalent vaccine in 2012 with GAVI support (GAVI support ending in 2015).
- The National Immunization Strategy 2014 re-iterates its intention (objective #f) to commence disease burden studies and "development of implementation plans with a view to introduce new vaccines" such as Human Papilloma Virus (HPV) vaccine, Rotavirus vaccine, Pneumococcal vaccine and Japanese Encephalitis vaccine.
- Coverage rates of routine immunization have increased in recent years but not remained below 85% but also shown a slight decline in 2014 (Figure 10).

Figure 10: WHO/UNICEF estimates of immunization coverage by antigens and years

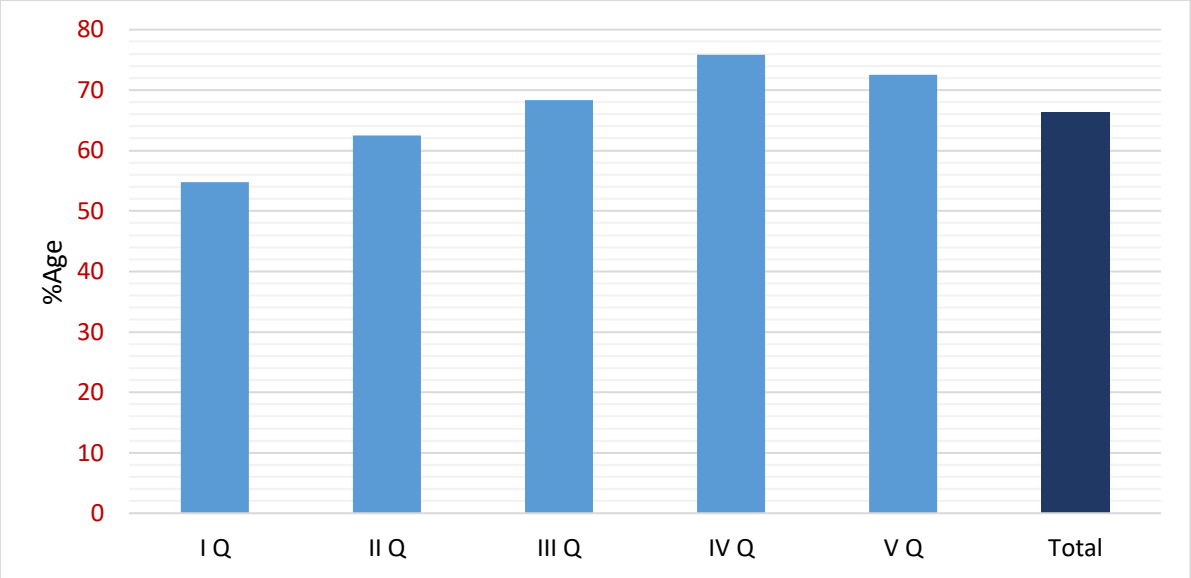


- On average, the DTP3 coverage has increased from the level of 55% in early 2000s to 77% in 2014. In a majority of the municipalities (7 out of 13), immunization coverage remained below 80% with one municipality (Ainaro) below 60%. In three municipalities, the coverage remained more than 90%.[12]
- BCG coverage rate has fluctuated between 70% to 85%. Measles coverage remained below 75%.
- A stock-out of measles vaccine was observed in 2013 due to the late renewal of the procurement agreement between the GoTL and UNICEF.

[12] Annual Health Report Timor-Leste 2014

- Inequity in coverage with immunization services was observed across wealth quintiles: immunization coverage was higher among children from wealthiest households (Figure 11).

Figure 11: Share of DPT3 coverage among fully immunized children by income quintiles



Source: Demographic and Health Survey 2009-10

- According to the findings of Demographic and Health Survey 2009-10, there were no significant discrepancies occurred in reaching boys versus girls (although sex-disaggregated data in administrative reporting was not available)[13].

According to the cMYP (2011-2015) the primary constraints for achieving and maintaining routine immunization coverage (>=80% FIC in all municipalities) were as follows:

- Proportion of population living in remote, or difficult to access areas
- Lack of qualified health staff for making the services available, including management capacity
- Low proportion of births attended by trained health staff, probably explained by the point above
- Low sensitivity for detecting and reporting VPDs

The desk-review of barriers to increasing routine vaccination coverage conducted in 2013 summarized its findings as follows:

- Lack of qualified personnel for increasing service provision availability and quality and strengthen micro-planning.
- Low quality and reach of community health services and outreach, in particular challenges to reach population living in remote or difficult access areas and low proportion of births attended by trained health staff.
- Lack of effective community participation

[13] According to the findings of GAVI Internal Appraisal 2014

- Weaknesses in the vaccine and cold chain management. Particular areas of concern are stores management, temperature monitoring and vaccine distribution capacity

The findings of the Joint National/International Review of EPI and VPD Surveillance in Timor-Leste 2015 reveal that:

- The capacity of the cold chain is insufficient. Only fixed service delivery sites (SISCa and health posts) are functioning and 70% of them are not capable to deliver immunization services due to the absence of cold chain.
- Furthermore, SISCAs fail to fulfill its role in terms of covering hard to reach population (as long as they operate in proximity of existing health facilities). Although health posts provide ANC and deliveries, they do not have vaccines to administer BCG and OPV0 to newborn in first 24 hours.
- Human resource constraints:
  - High load of health staff (performing multiple tasks under "integrated MNCH package") along with inequitable distribution at the primary healthcare level is another constraint for immunization performance.
  - The review noted that most of health staff and newly recruited doctors in particular lack immunization related skills/knowledge and supportive supervision was also inadequate.

Indicators	2012	2013	2014
Official Coverage Estimates[14]	%	%	%
Penta/DTP1	94	86	81
Penta/DTP3	83	82	77
OPV3	83	82	76
Measles 1	73	70	74
Most Recent Survey Coverage % DTP3	83[15]		
% Fully Immunized Child			57.9[16]
TT 2+ coverage among women	81	81	81
Access and demand			
Dropout Rate between Penta1 and Penta3	17	14	4
Immunization Equity	%	%	%
% gap in coverage for fully immunized children between highest and lowest socio economic quintiles			
Number and proportion of municipalities with Penta/DTP3 coverage > 80%			46.2
New vaccines introduced into the routine schedule in the last plan period			
		Penta	

Program effectiveness

There are many strengths in the routine immunization system service delivery, including:

[14] UNICEF-WHO Immunization Coverage Estimates
[15] Timor-Leste Food and Nutrition Survey 2013
[16] National EPI Report 2014

- Immunization is integrated into the PHC framework at the municipality level
- The proportion of health personnel to total population is one of the best in the region
- In almost half of the Sucos (village) there is at least one HP
    - As per the national policy, each HP should have at least one doctor and midwife and/or a nurse; often these professionals are in place
    - HPs have more access to electricity (currently around 37% of HPs electrified)

If all HPs were equipped with appropriate cold chain equipment and staff were trained on basic immunization skills, that will improve access to service delivery for the majority of rural population through more frequent vaccination sessions, especially as the current system provides only one session per month for each Suco. That will also reduce the chances of vaccines to lose potency during transportation from CHC to far-flung Sucos during the SISCa days, and will improve the credibility of the health system among the population.

1.4.3 Accelerated Disease Control Initiatives

(1) Polio

Timor-Leste has been certified polio-free on the 27th March 2014, together with all other countries in the WHO South-East Asia Region. To maintain its polio-free status Timor-Leste:

- Offers four doses of OPV including a birth dose to infants,
- Has a framework for active surveillance for acute flaccid paralysis (AFP) cases and laboratory testing in the Regional Reference Laboratory in Thailand
- Completed phase one laboratory containment of wild poliovirus infectious and potentially infectious materials, and
- Established a polio outbreak preparedness and response plan
- The National Certification Committee for Polio Eradication (NCCPE) oversees the polio-free status
- In 2015, a nationwide Polio vaccination campaign was conducted.
- The key reporting standards for AFP surveillance were not met in 2014 and 2015

(2) Measles elimination and rubella/CRS control

For several years prior to 2011 there were no confirmed measles case in Timor-Leste. Confirmation testing of suspected measles case was just being implemented in 2008-2009. In 2011 there was a major measles epidemic in the country:

- Eighty-seven measles cases were confirmed in 6 municipalities.
- The actual number of cases was many times greater (739 reported cases).

Since then there have been sporadic cases of confirmed measles, including 26 laboratory confirmed cases in 2014.

- Measles coverage remains low at the level of 70%. In 2015, a nationwide Measles vaccination campaign was conducted.

(3) Maternal and neo-natal tetanus elimination (MNT)

Elimination of maternal and neonatal tetanus (MNT) in Timor-Leste was confirmed in 2012 through the WHO formal validation process:

- Reported TT2+ coverage increased from 66% in 2008 to 81 in 2013 and sustained afterwards
- According to the Demographic and Health Survey of 2010, three-quarters of mothers with a live birth in the five years preceding the survey received two or more tetanus toxoid doses during their last pregnancy, and four-fifths were protected for their last birth.

1.4.4 Analysis of Immunization system performance

(1) Data management system

According to the EPI review 2008, child health cards (included in mother's health record books - LISIO) have been used for every child to record immunization or other child services delivered. However, it was noted that many parents do not bring child health card when visiting clinics for vaccination.

Administrative reporting practice were weak in 2008:

- Transcription errors occurred when information on vaccination written on pieces of papers were transferred to the registers (managed by healthcare providers for recording cases of deliveries and vaccination)
- Dates of immunization were often missing in the registers, leading in wrong intervals between doses administered
- Healthcare providers reported to DHS and national level on vaccines used and vaccine doses administered using different forms and data was not accurate.
- Different sources of population estimates were used by healthcare providers: many of them used Suco-administrative birth registration data to define target population, while others used 2004 census data provided by the MoH.

DHS submitted consolidated reports on immunization to the national level regularly and in time. Due to the consolidation, the data at the national level cannot be disaggregated by service providers. Although computerized data flow is used between DHS and national levels, the EPI review did not find that the data is either analyzed (by DPHO or national EPI managers) or used to define practical programmatic actions.

The country made significant progress in data management and reporting as revealed by the recent EPI review:

- Vaccination is captured in registries and reported in standardized age disaggregated forms from health facilities to municipalities, and in an aggregated format at national level on a monthly basis through the Health Management Information System (HMIS)
- Immunization data is integrated in DHIS-2 system that will be rolled out over the next years

- Reporting timeliness improved from 41% to 91% between 2011 and 2014.
- 2010 Census is used to estimate target population for planning and coverage measurements
- LISIO booklets to record ANC and vaccination of mother and child have been received by the majority of mothers; a 2014 survey identified 86% of women having a LISIO booklet

However, the EPI Review 2015 identified the following problems have not been resolved:

- Unreliability of coverage calculations: target population estimates were often not reliable and differed from family health registration
- DPHO/MPHO are not fully reporting VPD surveillance cases through HMIS (instead, reporting being done directly over phone); as a result, only 4 measles cases were reported through the HMIS system in 2014 while 47 measles were reported in the VPD surveillance database.
- Inconsistent application of FIC definition – namely counting OPV0 for FIC
- Quality of data/quality control: it was unclear if the quality of vaccination data was assessed or how effective was the supervision
- Poor data registration (recording) practices:
  - Registers and forms were outdated (often not reflecting the existing vaccination schedule)
  - Registers and daily tally sheets not either available or were self-made
- Inadequate analysis and use of immunization data in management and operation

(2) Immunization communication strategy

According to the recent EPI review, current social mobilization activities are insufficient to sensitize demand for immunization due to numerous reasons:

- Low capacity of the Health Promotion at national and sub-national levels
- Absence of communication or social mobilization plan
- Limited resources for communication and social mobilization
- Managerial and operational weaknesses (e.g. no systematic coordination of key community mobilizers)

These findings are also validated by a demand-side study which examined the factors limiting immunization coverage in urban Dili.[17] The study findings revealed that the main reasons for low vaccination rates in urban Dili included caregivers' knowledge, attitudes, and perceptions as well as barriers at immunization service sites. Other important factors were access to services and information, particularly in the city periphery, health workers' attitudes and practices, caregivers' fears of side effects, conflicting priorities, large family size, lack of support from husbands and paternal grandmothers, and seasonal migration.

[17] Ruhul Amin et al. (2013) Factors limiting immunization coverage in urban Dili, Timor-Leste. Glob Health Science and Practice. November 1, 2013 vol. 1 no. 3 p. 417-427

(3) Human resources for health and for immunization

According to the National Health Sector Strategic Plan 2011-2030, the government will develop the necessary human resources so that there will be at least one doctor, two nurses, two midwives and a laboratory technician in every suco with at least 2,000 people.

Figure 12: Health staff at Health Post Level (2014)[18]

Medical Doctors	406
Midwives	103
Nurses	189

The EPI review 2015 noted the following concerning human resources in health:

- Health staff placement is not always optimal (numbers and skills), and high turn-over of staff:
  - If all HPs were equipped with cold chain equipment and ***staff were trained on basic immunization skills***, that will improve access to service delivery for the majority of rural population through more frequent vaccination sessions
  - Skills of the staff could be one of the reasons of observed inter-administrative differences in performance and immunization coverage
  - Some of the clinicians lacked the skills required for laboratory VPD surveillance and some laboratory and clinical staff had not been trained on sample collection, storage and transportation
- "Although knowledge and skills are still to be improved among the health staff, **the currently available human resources in the health sector in Timor-Lesté represent a real strength of the Immunization and VPD Surveillance programmes" (page 27)**

(4) Supervision and surveillance activities

VPD surveillance guidelines defining the steps for AFP and VPD surveillance were first published in 2005. The 2nd edition of "Integrated VPD Surveillance Guidelines" published in 2008 defined VPD surveillance strategies, case definitions, data collection and reporting, specimen collection procedures and investigation steps.

One person, the surveillance manager, was responsible for all communicable disease surveillance at the national level in 2008. The VPD Surveillance network consisted of a number of reporting units at different levels of the health system. The EPI review 2008 found that in most of the municipalities, the network was adequate and was well distributed geographically. However, the reporting system is paper-based and it has suffered from declining report submission rate since 2005. Overall, the Review concluded that human resources and logistics at levels were inadequate for effective VPD surveillance.

When compared to the findings of the EPI review 2015, substantial progress was made afterwards:

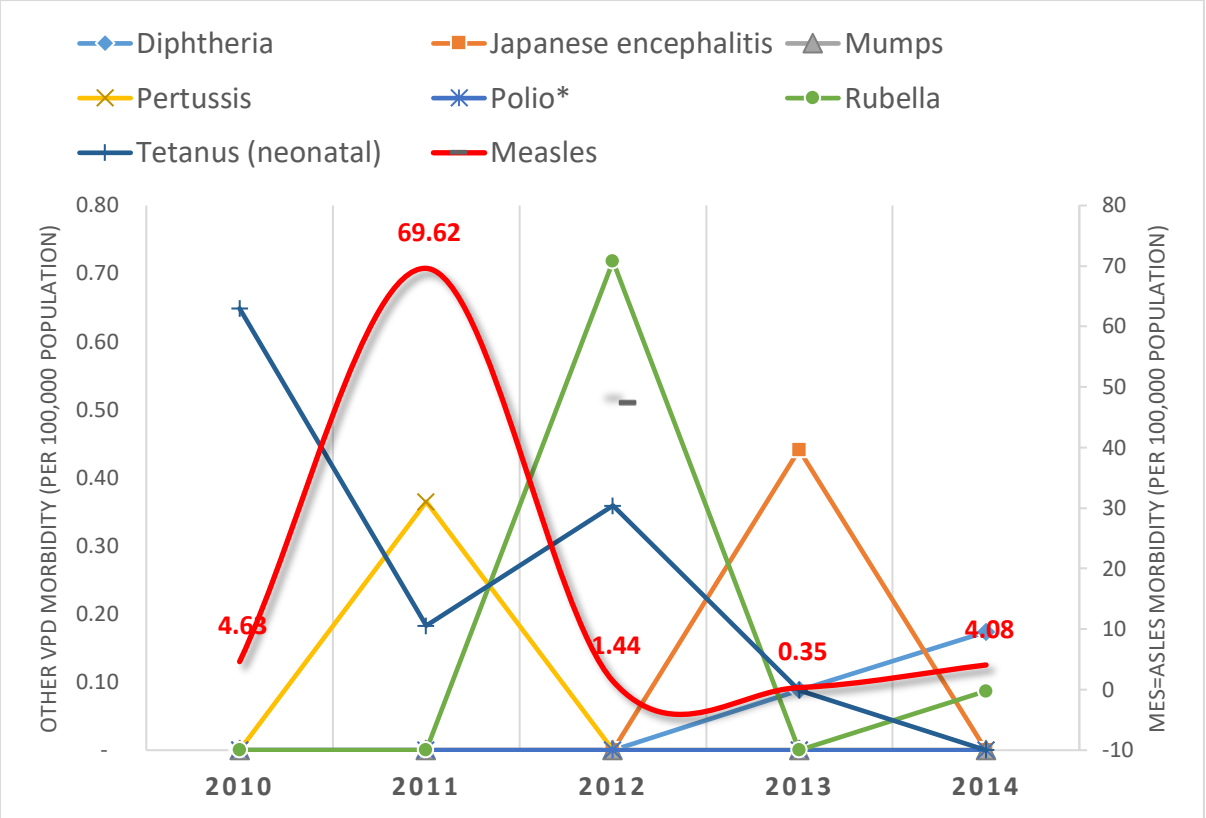
- There are 6 specialists working on VPD surveillance at the national level
- The VPD Surveillance Department is under the Direction of Disease Control Services in the Ministry of Health and is composed of 3 units including data management

[18] National M&E Database 2014

- The VPD surveillance network is well integrated to include the reporting of other communicable diseases and the reporting is done on a weekly basis.

It was estimated that 10-12 AFP cases should have been detected every year (or >=2 cases per 100,000 population aged <15). Only 0.1 case (per 100,000 population aged <15) were detected in 2008. In 2014, it was 0.59, which is much below satisfactory.

Figure 13: Burden of vaccine preventable diseases



The following issues to be addressed were identified by the recent EPI review:

- Inadequate staff/ resources at central level for achieving high quality surveillance
- Poor coordination between surveillance unit of the MoH and national hospital/referral hospitals
- VPD guidelines, recording and reporting forms not present in several of the DPHO/MPHO and health facilities visited
- Health staff at the DPHO/MPHO and health facilities levels not adequately trained on case detection based on case definitions
- No laboratory capacity at the municipality and administrative postu levels for sample collection, storage and transportation to the national laboratory

(5) Procurement and supply chain of vaccines

Procurement of vaccines

The National Immunization Strategy 2014 devoted component 3 to the procurement, supply and distribution of vaccines and other supplies:

- "The Ministry of Health will ensure that adequate quantities of WHO prequalified vaccines and other supplies required for the immunization programme will be procured in a timely manner.
- A distribution plan will be put in place to ensure that no child or mother will be turned away from immunization session due to stock outs of vaccines or other supplies.
- For storage, distribution and administration of vaccines, WHO vaccine management guidelines will be followed"

The Strategy reaffirms that all vaccines and supplies will be procured through UNICEF Global Procurement Mechanism and WHO pre-qualified product. The Ministry staff has limited experience and skills in forecasting the quantity of vaccines required. Therefore, very often, this process is completed with technical assistance from WHO and UNICEF local staff.

Cold chain (CC) and Logistics

In 2015, the GoTL in close coordination with UNICEF has procured a huge quantity of cold chain equipment and spare parts. This cold chain equipment has been supplied to the municipality level, CHCs and HPs. This procurement and supply was made in accordance with the EVM improvement plan developed after the previous EVM conducted in 2013.

The recently conducted EPI review 2015 revealed problems in the distribution of vaccines at both levels (from national to municipalities and then from municipalities to CHCs and HPs).

The following vaccine management issues were highlighted by the EPI review 2015:

- Substantial weaknesses in temperature control and management especially at municipality level and below levels
- High level of wastage (around 50% of vaccines)
- Inconsistencies in stocks-in-hands data/reports (making it impossible to carry out a vaccine stock analysis)

The GAVI Internal Appraisal could not assess wastage rates for Pentavalent or other vaccines for 2013 due to the lack of data at the national level.

According to the National Policy, the following vaccine stocks should be available at each level (Figure 14).

Figure 14: Vaccine stocks at different supply chain levels

Supply Chain Level	Working stock (months)	Safety stock (months)	Total stock (months)
Central level	6	6	12
Municipality level	3	1	4
CHC level	1	1	2

HP level[19]	1	1	2

Source: National Standard List of Vaccine Cold Chain Equipment 2015, EPI, Ministry of Health

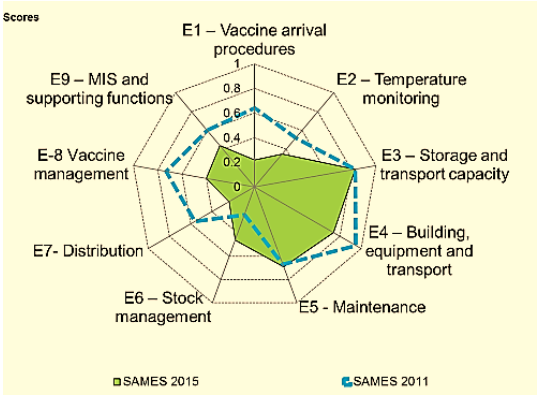
The national policy requires that the following vaccine stocks levels be followed, though it is not always the case. Therefore, the national level can potentially have a rather large stock of vaccine on which the entire EPI is relying.[20] Failure to ensure the safety and potency of the vaccines can not only result in important financial loss, but also an interruption in the program activities and confidence of the public.

According to the cMYP, there were not cold chain equipment in 2010 at village level (see Figure 14 on page 92 for details). The cost of available cold chain equipment (all procured in 2010) was 195 thousand US$ as stated in the cMYP costing tool. However, more recently, the HPs are being provided with refrigerators for vaccine storage provided electricity is available. In this regards, the EPI review noted that the government procured new cold chain equipment in accordance with the EVM improvement plan. However, repair and maintenance remains a major issue. Presently, repair and maintenance is carried out by private sector workshops. The Department of Medical Equipment and Maintenance has great potential to bridge this gap provided their technicians are trained in cold chain repair and maintenance and also provided necessary tool kits.

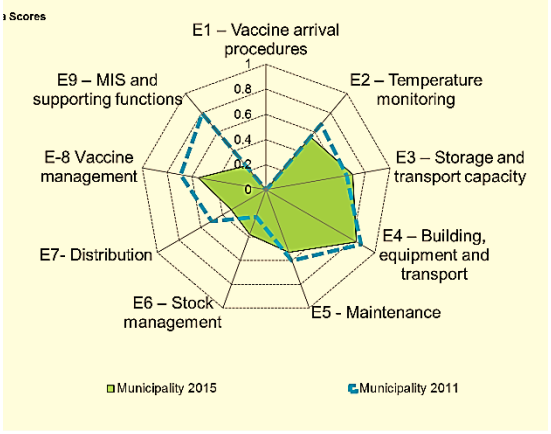
The preliminary findings of the EVM Assessment report 2015 highlight that the overall vaccine management has gradually deteriorated at all levels as compared to 2011. Although appreciable efforts were done in meeting additional cold chain needs, the management practices show deterioration and consequently, it appeared that there is deterioration of overall vaccine cold chain status (Figure 15 and Figure 48).

Figure 15: Comparison of EVM scores at various levels

Scoring comparison of National level SAMES



Scoring comparison of Municipality level[21]

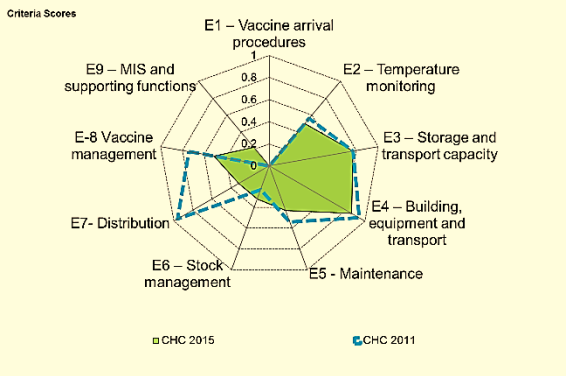


[19] If refrigerator available

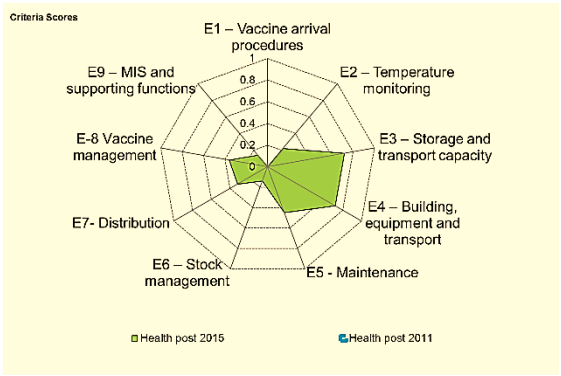
[20] National Standard List of Vaccine Cold Chain Equipment 2015, EPI, Ministry of Health

[21] Municipality level was considered as last distribution point in 2011 but since Health Posts are now equipped with cold chain equipment in 2015 and CHC distribute the vaccine to health post on monthly basis, Municipalities were considered as Sub national store, CHC as last distribution point and Health posts as service delivery level for 2015 assessment

Scoring comparison of CHC level



Scoring comparison of Health post level



Creating a permanent position of trained vaccine supply chain logistics and cold chain person at the national level, structured training programs for health workers (including: induction training program for all new health workers, refreshers trainings and MLM training of districts supervisors) and providing recently updated SOPs on vaccine management practices, cold chain maintenance and contingency planning at all levels are few of the major recommendations of the EVM assessment report 2015.

(6) Immunization financing

The National Immunization Strategy 2014 calls for establishing a dedicated budget line for vaccine and other EPI logistics in the national budget; however, it is yet to be implemented. The statistics and analysis of the financing of immunization system in 2014 is detailed in Section 4.2.

1.4.5 Partner support

WHO

WHO, Timor Leste supporting Ministry of Health especially for immunization program with technical assistance with fulltime medical officer EPI and VPD Surveillance National Professional officer EPI (recruited with GAVI funding support) in following areas;

1 Provide regular technical guidance to strengthen routine immunization and VPD surveillance, program management and new vaccine introduction.

2 By assisting MoH to conduct Joint National and International Comprehensive EPI/VPD Surveillance Review and support for implementation of recommendations

3 Technical and financial support to conduct wide age range MR/OPV campaign (This activity was supported with deployment of 6 district level international consultants for 4-month period).

4 Assist MoH to establish National Immunization Technical Advisory Group

5 Assist MoH to develop new CMYP for years covering 2016 - 2020

6 Assist MoH to conduct EVM assessment in 2015

7 Supporting Ministry of Health to do regular program review by providing secretarial support to conduct regular EPI working group meetings

8 Supporting capacity building by guideline development, training material development and involve in training of immunization program

9 Supporting in supportive supervision mechanism

10 Assisting Ministry of health in planning and budgeting

11 Assist Ministry of health to conduct post introduction evaluation for new vaccines

12 Supported 2 MOH officials to participate in 2014 and 2015 ITAG meetings. One MoH officer to participate in 2015 SAGE is meeting as observer and supporting another three officials including NCCPE chair to participate in 2015 RCCPE meeting.

Accordingly, MoH strongly requested for continued WHO technical assistance in P4 level to continue the activities commenced in 2015 to achieve above objectives until MOH gained the necessary technical competence.

UNICEF

UNICEF Timor-Leste provided the following Technical Assistance and other support to the Ministry of Health:

1 Effective Vaccine Management: Assisted vaccine and cold chain supplies forecasting, procurement and distribution, implementation of EVM improvement plan implementation including equipping 209 health facilities among which were 160 health posts with cold chain equipment (174 with GAVI HSS funding and 35 from UNICEF's funds), developing standard list of cold chain equipment and standard operating procedures for vaccine management, procuring, distribution and equipping cold chain temperature monitoring devices at all levels.

2 Reaching the unreached: Assisted micro planning for reaching the unreached community and children in 10 districts.

3 Creating Demand for Immunization: Supported development and implementation of the social mobilization for the Measles Rubella / OPV campaign. Support for communication, including nation-wide capacity building for interpersonal communication and community mobilization for measles, rubella, IPV and DT booster introduction is ongoing.

4 Building Capacity for Immunization: Updated the mid-level managers training modules and immunization in practice training modules; developed national immunization guidelines and job aids to support the health workers and immunization program management. A total of trained 37 mid-level immunization managers and 50 health workers of four municipalities were trained. Training of additional 25 on immunization in practice and another 25 cold chain managers on vaccine management SOP is on-going.

5 Immunization and Health system strengthening: Assisted Ministry of Health to integrate the routine immunization functions, supplies and equipment into the new Comprehensive Primary Health Care Guideline and Package. In addition, UNICEF also assisted Joint MCH and EPI micro-planning supported the implementation of GAVI Health Sector Strengthening project and EPI Progress Reviews.

1.5 Summary – SWOT

Strengths	Weaknesses
• Political will to strengthen health coverage services • Significant increase in health posts • Significant increase in # doctors (but lack of EPI experience and training for these can be weakness) • Significant increase in availability of electricity (support cold chain in more areas and increased frequency of sessions) • New cold chain equipment to expand reach	• Administrative reporting of coverage, wastage, etc. from bottom level up • Insufficient personnel with range of EPI experience (logistics, communication, etc.) to support program • Insufficient supervision due to lack of trained personnel with EPI focus at district level • No budget line for vaccines or equipment • Insufficient surveillance to understand disease burden for new vaccines • Insufficient microplanning and tracing • Lack of bottom up based planning & budgeting for EPI that links policy objectives to actions
Opportunities	**Threats**
• DHIS2 can be used for improved data collection and analysis • Open source information systems exist and that can be adapted to improve flow of information in supply chain	• Economic growth reliance on oil and gas (subject to downward trend) • Reduced support from donors (although this can present an opportunity for country to strengthen its financial and HR commitments to immunization) • High level of integration within MCH & Health (can be advantage, but difficult to prioritize immunization and assure adequate resources; weaknesses in SISCa limit outreach effectiveness but immunization has little leverage to improve)

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:

- Zero cases of measles by 2020
- Zero cases of neonatal tetanus by 2020
- The number of cases of diphtheria <5 by 2020
- Sustain polio free status

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% by 2020
- Improve routine immunization equity:
  - Geographic: the number of districts with
    - less than 90% coverage for all antigens - 1 (out of 13) by 2020
    - Less than 95% coverage for measles – 0 (out of 13) by 2020

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

Indicators	Baseline 2014	2016	2017	2018	2019	2020
1. Increase BCG coverage	79%	87%	90%	90%	95%	95%
2. Increase Hep-B birth dose coverage		60%	65%	70%	75%	80%
3. Increase OPV-0 dose coverage	57.4%	60%	65%	70%	75%	80%
4. Increase OPV3 coverage	76%	87%	90%	90%	95%	95%
5. Increase Penta3 coverage	77%	87%	90%	90%	95%	95%
6. Increase IPV coverage		87%	90%	90%	95%	95%
7. Increase Rota vaccine coverage				60%	70%	80%
8. Increase Measles-Rubella-1 coverage	74%	82%	86%	90%	95%	95%
9. Increase DTP coverage		30%	40%	50%	60%	80%
10. Increase Measles-Rubella-2 coverage		30%	40%	50%	60%	80%
11. Increase DT coverage		20%	30%	40%	50%	60%
12. Increase TT 2+ coverage	81%	83%	85%	87%	90%	90%
13. Increase the % of	57.9%	80%	85%	90%	95%	95%

children fully immunized (under 1 year)						
14. Increase the % of children fully immunized (5-6 year)		20%	30%	40%	50%	60%
15. Decrease dropout rate between Penta1 and Penta3 coverage	4.9%	2.2%	2.2%	0.0%	0.0%	0.0%
16. Decrease dropout rate between BCG and MR-1 coverage	6.2%	5.6%	4.3%	0.0%	0.0%	0.0%
17. Improve geographical equity - % of districts that have at or above 80% Penta3 coverage	46.2%	53.8%	76.9%	92.3%	92.3%	92.3%
18. Improve geographical equity - % of districts that have at or above 90% Penta3 coverage	23.1%	38.5%	69.2%	84.6%	92.3%	92.3%

The above stated objectives and targets are fully aligned with directions stated in the National Strategic Development Plan (NSDP) 2011-2030 and the National Strategy on Reproductive, Maternal, Newborn, Child and Adolescent Health 2015-2019.

2.2 Strategies and main activities

2.2.1 Overview of strategies and key actions

According to the VPD and Surveillance Review 2015, the following key actions are required to improve the EPI performance:

1 Recruitment of 7 EPI support officers (one per two municipalities + 1 for the enclaved municipality) to be funded through WHO. Their role will be to support the Municipality Health Team and teams working at CHC and Health Post level in supportive supervision, reporting, developing and implementing micro plans, and validation of information

2 All the Health Posts to be provided cold chain for establishing Fixed EPI centers

3 Guidelines and Tools development for streamlining the EPI related information system

4 Conducting systematic and periodic reviews at national, municipality and CHC level for monitoring and nurturing a culture of accountability

5 30% population does not come to facilities. Health care providers to provided outreach services (as stipulated under strategies for domiciliary visits of the National Comprehensive Package for PHC) to visit every village at least once in a month

6 Provide logistic support for the above mentioned outreach sessions

7 Establish suco/village-specific MNCH registration and follow up registers at health post level primarily focusing on missed out children defaulters and dropouts

8 Develop VPD surveillance system as recommended in VPD review

9 Training of all health staff on VPD surveillance

10 Community mobilization through enhancing the role of churches in creating awareness and motivation

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:

Problems / challenges	Service delivery	Vaccine supply and logistics	Monitoring and disease surveillance	Advocacy, communication and demand generation	Program management
Low immunization coverage	1. Increase the availability and performance of PHC providers through: 1.1 Administrative mechanisms 1.2. Improve health worker skills in immunization	2. Improve effective management in accordance with the EVM improvement plan	3. Improve routine data collection and reporting (through integration into DHIS2)	4. Evaluate barriers to access immunization services 5. Develop and implement targeted communication strategies to generate demand	Incentives for health care workers
Inequities in immunization coverage	2. Optimize delivery strategies in specific target areas and expand geographical coverage 3. Improve micro-planning in order to: minimize missed opportunities				Strengthen supportive supervision in selected (low performing) districts
Low financial sustainability	3. Improve micro-planning in order to decrease wastage rates		Generate evidence on the VPD burden before the introduction of new	Introduce the line item for vaccines and EPI activities in the state	Increase capacity of MLM in planning

from 2018	and increase the efficiency		vaccines	healthcare budget Secure state funds for the transition to domestic funding from 2018	and supervision

(1) Service Delivery

ISC Objective 1: **Strengthen and optimize capacity of immunization service delivery**

The objective of the immunization system component is to strengthen capacity of immunization service delivery. It means that by 2020:

- Proportion of health care facilities not having EPI centers decreased to zero
- Proportion of Fixed-EPI centers not having Skilled Immunization Staff (SIS) decreased to zero

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

Strategy 1.1: Capacity building of Skilled Immunization Staff for all CHCs, Health Posts and Referral Hospitals

Activity 1.1.1: Train and sustain at least 3-member Health Post MCH Team[22] on immunization practices and other immunization activities for every health post

Activity 1.1.2: Train and sustain at least 6-member CHC MCH Team[23] (2Doctors+2Nurses+2Midwives) on immunization practices and other immunization activities for every CHC

Activity 1.1.3: Train and sustain at least 6-member MCH Team[24] (2Doctors+2Nurses+2Midwives) on immunization practices and other immunization activities for every referral hospital

Activity 1.1.4: Conduct a package of integrated trainings for newborn care with immunization an essential component and train health care providers on: Essential Newborn Care, Community-based Newborn Care and Managing Newborn Problems

Activity 1.1.5: Establish Centers of Excellence in every municipality as sub-national training sites

Strategy 1.2: Capacity building of skilled immunization staff

Activity 1.2.1: Carry out induction trainings for newly recruited doctors, nurses and midwives in immunization practices, introduction of new vaccines, micro-planning, advocacy and awareness, surveillance (focusing on VPD surveillance) and reporting mechanisms etc.

Activity 1.2.2: Carry out refresher training for existing skilled immunization staff (doctor, nurse and midwife) in immunization practices, introduction of new vaccines, advocacy and awareness, surveillance and reporting mechanisms etc. at least once in 3 years

[22] Health Post MCH Team (Doctor+Nurse+Midwife)
[23] CHC MCH Team (2Doctors+2Nurses+2Midwives)
[24] MCH Team (2Doctors+2Nurses+2Midwives)

Strategy 1.3: Expansion in the existing coverage of EPI-fixed centers

Activity 1.3.1: Establish EPI-Fixed centers in 78 Health Posts that are operational but without their own ILRs/cold chain equipment

Activity 1.3.2: Established EPI-Fixed centers in Health Posts that are to be established in uncovered areas (10 per year from 2017 onwards)

Activity 1.3.3: Involve private health sector and NGOs for expansion in the network of EPI-Fixed centers in private health care facilities

Strategy 1.4: Increase in performance/efficiency (effective coverage) of existing EPI Centers

Activity 1.4.1: Implement EPI standards established under National EPI Strategy, Comprehensive Service Package for PHC and Guidelines for Domiciliary Visits

Activity 1.4.2: Mobilize additional qualified skilled immunization staff by training of newly appointed doctors and refresher courses for nurses and midwives

Activity 1.4.3: Improve micro-planning by increasing use of household listing through regular supportive supervision of designated staff at EPI centers

Activity 1.4.4: Improve data validation through field monitoring and supportive supervision

Activity 1.4.5: Regular use of integrated MCH/EPI micro-plan at CHCs and Health Posts

Strategy 1.5: Expansion in vaccination coverage for remote areas through effective outreach and mobile services

Activity 1.5.1: Identify the geographical areas not covered under that are difficult to reach for curative and preventive health services provided through CHCs and Health Posts

Activity 1.5.2: Identify and map geographical areas to be covered through outreach and mobile immunization services with focus on defaulter tracing

Activity 1.5.3: Prepare and implement area-specific outreach immunization micro plans integrated in MCH domiciliary visit plans for all the Sucos and Aldieas

Activity 1.5.4: Increase number of outreach and mobile teams as per the requirement of the area specific micro-plans

Activity 1.5.5: Monitor and supervise outreach immunization services

Strategy 1.6: Implementation of Supplementary Immunization Activities (SIAs)

Activity 1.6.1: Conduct Measles campaign for children (9-59 months) in 2018 and with expected coverage of 95%

Activity 1.6.2: Conduct Japanese Encephalitis vaccine campaign for children (1-10 years) in 2018 with expected coverage of 95%

Strategy 1.7: Introduction of new vaccines in routine immunization schedule;2

Activity 1.7.1: Introduce Hep-B Birth Dose 2016

Activity 1.7.2: Introduce Measles-Rubella Vaccine with 2-dose schedule in 2016

Activity 1.7.3: Introduce DTP vaccine for children at the age of 18 months in 2016

Activity 1.7.4: Introduce DT vaccine for children at the age of 6 or entry in school in 2016

Activity 1.7.5: Introduce Rotavirus vaccine in 2018 after approval from NITAG

(2) Vaccine, cold chain and logistics

ISC Objective 2: **Improve/sustain uninterrupted supply, quality, safety and utilization of vaccines, Injection equipment and other logistics to immunization service delivery**

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 municipality EPI stores with average EVM score above 80%
- 70% of CHC EPI stores with average EVM score above 80%
- 70% of Health Post EPI stores with average EVM score above 80%

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

Strategy 2.1: Strengthening of Vaccine Logistic Management Information System

Activity 2.1.1: Regularly update inventory of exiting cold chain equipment and logistics (including date of installation/supply) by collecting data from national, municipality, CHC and Health Post levels

Activity 2.1.2: Develop and install 'Dash Board' for real time data monitoring on vaccine distribution through linking with National M&E System under DHIS-2

Activity 2.1.3: Determine need for new supply and replacement of cold chain equipment and logistics at per the latest EVM assessment report 2015

Activity 2.1.4: Implement specifications and procurement plan as per EVM assessment report 2015 (aligned with the availability of funding)

Strategy 2.2: Expansion of existing cold chain and vaccine management for the introduction of new vaccines and opening of new service delivery facilities

Activity 2.2.1: Procure and install one cold room for National EPI Store

Activity 2.2.2: Procure and install Ice-lined Refrigerators for CHCs and Health Posts as per the criteria laid down in National Standard List of Vaccines and Cold Chain Equipment (128 new Health Posts during 2016-20)

Activity 2.2.3: Develop cold chain installation plan in alignment with national electrification plan for Sucos/health posts

Activity 2.2.4: Procure and supply other cold chain equipment including spare parts and toolkits for repair and maintenance

Activity 2.2.5: Train vaccine management personnel in logistic and vaccine management

Activity 2.2.6: Train technicians at Department of Medical Equipment and Maintenance for repair and maintenance of cold chain equipment

Strategy 2.3: Improve transportation of vaccines, injection equipment and other logistics

Activity 2.3.1: Forecast requirement of vaccines, injection supplies and other logistics at national, municipality and health facility levels

Activity 2.3.2: Monitor temperature maintenance during transportation by using digital records

Strategy 2.4: Up gradation of cold chain temperature monitoring and tracking system by using innovative IT technologies

Activity 2.4.1: Install and maintain Remote Temperature Monitoring Device (RTMD) System at national level

Activity 2.4.2: Procure and install 30-day electronic temperature logger devices for installation at municipality level and EPI-fixed centers

Activity 2.4.3: Develop and install 'Dash Board' for temperature monitoring of cold rooms and integrate the system with online monitoring of vaccine stocks and distribution by linking with the National M&E System

Strategy 2.5: Improvement in vaccine management by implementing EVM Improvement Plan

Activity 2.5.1: Carry out EVM assessment every three years (next is due in 2018)

Activity 2.5.2: Revise the annual work plan in accordance with the EVM improvement plan based on the EVM Assessment Report 2015

Activity 2.5.3: Implement EVM improvement plan especially focusing on capacity building of cold chain management staff at all levels

Activity 2.5.4: Report on the progress of implementation of the EVM improvement Plan

Strategy 2.6: Expansion/up-gradation of transport system for field monitoring and supervision

Activity 2.6.1: Procure and supply one 4-wheel drive vehicle for field monitoring and supervisory staff at national level

Activity 2.6.2: Procure and supply motorbikes for field monitoring and supervision by Municipality Support Officers

(3) Monitoring and disease surveillance

ISC Objective 3: **Performance of routine monitoring/reporting and disease surveillance improved**

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 3%
- 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 3.1: Streamlining data collection and reporting practices through integration in DHIS-2

Activity 3.1.1: Assess main causes of data quality flaws and discrepancies between the existing Program-specific data recording registers and the reporting formats being used under National HMIS and M&E System

Activity 3.1.2: Develop an integrated system of data recording registers at the health facility develop thorough integrated in DHIS-2

Activity 3.1.3: Integrate EPI routine monitoring into mainstream data management

Activity 3.1.4: Introduce regular system of formal feedback mechanism on the administrative reports of subordinated entities

Activity 3.1.5: Conduct periodic EPI progress/VPD surveillance reviews at national, municipality and CHC levels

Strategy 3.2: Strengthening accuracy of reporting through validation in field

Activity 3.2.1: Implement Central and Municipality Supportive Supervision program through quarterly and monthly field visits respectively

Activity 3.2.2: Conduct 3/30 cluster surveys for random coverage assessment

Activity 3.2.3: Conduct data validation through field monitoring visits

Activity 3.2.4: Conduct Data Quality Audit (DQA) and Data Quality Self-Assessment (DQS) at regular intervals

Strategy 3.3: Research, evidence generation and dissemination before introduction of new vaccines

Activity 3.3.1: Conduct burden of disease study for Rotavirus, Human Papillomavirus (HPV), Japanese Encephalitis (JE) and Pneumococcal Pneumonia with cost analysis

Activity 3.3.2: Publish and disseminate EPI annual progress report every year

Strategy 3.4: Expansion in surveillance network and coverage

Activity 3.4.1: Establish/strengthen sentinel surveillance system and capacity of national laboratory for Measles and Congenital Rubella Syndrome and conduct sero-surveys

Activity 3.4.2: Strengthen national laboratory for MR accreditation

Activity 3.4.3: Strengthen Adverse events following immunization (AEFI) surveillance under national vaccine pharmacovigilance

Activity 3.4.4: Support for National Committee activities required for verification of Polio and Measles Eradication and Elimination Certification

(4) Advocacy, communication and demand generation

ISC Objective 4: **Knowledge and attitude toward immunization improved among target population**

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 4.1: Evaluation of barriers to access immunization services

Activity 4.1.1: Conduct formative research (KAP studies) of the target population regarding immunization

Activity 4.1.2: Assess the effectiveness of the communication strategies and existing community participation strategy

Strategy 4.2: Advocacy and partnership building

Activity 4.2.1: Organize two advocacy seminar for political leadership every year

Activity 4.2.2: Organize advocacy meetings with technical leadership of MoH, Ministry of Finance and Ministry of Education

Activity 4.2.3: Conduct advocacy meetings with political leadership and administration at national, municipal and suco levels

Activity 4.2.4: Conduct advocacy meetings with donors and philanthropists

Activity 4.2.5: Conduct at least one advocacy seminar for media/religious leaders including churches etc. every year

Strategy 4.3: Behavior change communication and mobilization

Activity 4.3.1: Standardize immunization related information and content materials

Activity 4.3.2: Reinforce promotion of positive attitude towards immunization through creating synergies between multiple channels of communication and MCH program strategies group as part of MoH PHC Home and Family Care Practices promotion for Health and Nutrition

Activity 4.3.3: Increase effectiveness of interpersonal communication by using the existing network of human resources, especially nurses, community midwives and village volunteers

Activity 4.3.4: Activate social networks (community leaders, volunteers, women groups) and encourage peer communication to reach remote areas in order to disseminate information about the benefits of MNCH care and immunization

Strategy 4.4: Advocacy for resource mobilization for ensuring financial sustainability of immunization program

Activity 4.4.1: Use cMYP for financial projections on the 'funding gap' between existing resources and future requirements

Activity 4.4.2: Inform political and technical leadership about the importance of funding gap in terms of burden of morbidity and mortality due to vaccine preventable diseases

Activity 4.4.3: Mobilize political and technical leadership for increasing share for EPI-specific costs especially vaccines under national government budget

Activity 4.4.4: Develop financial projections for mobilizing donors and development partners on yearly basis

(5) Program management

ISC Objective 5: **Increase program management performance by strengthening the leadership capacity of Ministry of Health in immunization service delivery**

It means that by 2020:

- Integrated EPI annual plans are developed and consistent with the National RMNCH Strategy and cMYP 2016-2020
- 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 5.1: Increase number of managerial and supervisory staff and their capacity at different levels

Activity 5.1.1: Mobilize human resources from World Health Organization for technical assistance and continuous support[25]

Activity 5.1.2: Mobilize human resources from UNICEF for technical assistance and continuous support[26]

Activity 5.1.3: Advertise for and recruit one dedicated Cold Chain Manager at national level

Activity 5.1.4: Advertise for and recruit 7 Municipality Support Officers (1 per two districts in the mainland and one for Oecusse)

Activity 5.1.5: Conduct risk assessment workshop on maternal and neonatal elimination status

Activity 5.1.6: Implement a cascade capacity building program for Mid-Level-Manager's (MLM) training for national and municipality managers, Municipality EPI Support Officers and other managerial staff on: Results-based Planning, achieving results and team working skills, MLM, RED/REC, EVM, Surveillance and outbreak investigation every three years

[25] EPI Medical Officer, National Program Officer (EPI/GAVI), National Program Officer (VPD/Laboratory), Program Assistant (EPI/VPD)

[26] Immunization Officer, National Program Officer

Activity 5.1.7: Train national and municipality EPI managers on orientation and implementation of cMYP

Strategy 5.2: Development and institutionalization of performance management system through integration and alignment with Health Sector Strategic Plan and National RMNCH Strategy

Activity 5.2.1: Establish new and strengthen existing EPI Management Teams at national, municipality and sucos levels

Activity 5.2.2: Set and implement EPI-specific Minimum Service Delivery Standards (EPI-MSDS) for national, municipal, and suco levels

Activity 5.2.3: Develop criteria/methodology for competency assessment and performance appraisal of key EPI management staff (managers and supervisors) and skilled immunization staff (doctors, nurses and midwives trained in vaccination)

Activity 5.2.4: Align indicators for measuring performance standards with national M&E system at all levels

Activity 5.2.5: Develop policy guidelines and standard operating procedures (SOPs) for EPI-fixed centers in private health facilities

Activity 5.2.6: Establish National Committee on Causality Assessment

Strategy 5.3: Streamlining EPI planning processes

Activity 5.3.1: Develop EPI annual implementation plans integrated with MCH program and service package for domiciliary health services

Activity 5.3.2: Review and align cMYP with EPI annual implementation plan processes

Activity 5.3.3: Develop annual plans for: capacity building, HR recruitment, EPI service delivery expansion and infrastructure development, cold chain replacement, vaccine/logistic distribution, communication and advocacy, emergency and disaster like situations, M&E, Measles Elimination and Control of rubella/congenital rubella syndrome

Strategy 5.4: Streamlining accountability mechanisms at program management levels (national, municipal and suco levels)

Activity 5.4.1: Conduct biennial EPI reviews at national level

Activity 5.4.2: Conduct quarterly EPI performance reviews at municipal level

Activity 5.4.3: Conduct monthly EPI performance reviews at CHC level

Activity 5.4.4: Conduct annual performance appraisal of all EPI management and supervisory staff and skilled immunization staff

Activity 5.4.5: Conduct competency assessment of all EPI management and supervisory staff and skilled immunization staff every three years

Activity 5.4.6: Conduct mid-term and end-term evaluations of GAVI HSS Grant

Activity 5.4.7: Conduct annual independent audit of GAVI HSS Grant

Strategy 5.5: Minimize wastage of resources under immunization program

Activity 5.5.1: Rationalize use of POL for monitoring and supervision by management staff at all levels

Activity 5.5.2: Develop and introduce need-based supply of vaccines, syringes and other materials by incorporating bundling approach

Activity 5.5.3: Determine and minimize vaccine wastages and drop-out rates for different antigens

Strategy 5.6: Increase in effectiveness of trainings of EPI managerial, supervisory and skilled immunization staff

Activity 5.6.1: Introduce training need assessment, and pre & post trainings assessment as a mandatory requirement of training programs

Activity 5.6.2: Revise training materials as and when required under training need assessment reports

Activity 5.6.3: Maintain database for training programs and compare training outcomes prior to conducting follow up trainings

Strategy 5.7: Increase motivation of key staff of the immunization program

Activity 5.7.1: Arrange overseas study tours for national, municipality EPI managers and CHC staff

Activity 5.7.2: Develop a scheme on financial and non-financial incentives (carrier growth opportunities, performance based incentives etc.)

Activity 5.7.3: Explore possibilities for financing and implementation

2.3 Alignment with GVAP, Regional Targets and Health Sector Strategy

The national cMYP is aligned with most of GVAP Strategic Objectives and Strategies (Figure 37). In addition, the national immunization objectives are in line with the following seven regional strategic objectives[27]:

Regional Strategic Objectives	Key deliverables under cMYP 2016-2020
STRATEGIC OBJECTIVE 1: Polio is eradicated from the region	• Timor-Leste is certified Polio-Free • Polio risks assessed and adequate risk management plans in place for all countries, including adequate laboratory containment policies and practices • Timor-Leste continue to have high quality laboratory based surveillance and contingency plans in place for response in the event of an outbreak • Timor-Leste has introduced a single dose of IPV into National Immunization Plan
STRATEGIC OBJECTIVE 2: All countries on track to achieve measles elimination and rubella /CRS control by 2020	• National measles elimination and rubella/CRS control policy and strategies in place with all countries moving to case-based measles surveillance • 95% MCV1 coverage is achieved at national level, and at least 80% MCV1 coverage in all municipalities • MCV2 is introduced in routine immunization program and achieve high coverage with supplementary immunization campaigns for children (9-59 months) in 2018 • Rubella vaccine is introduced in immunization program • Target of <5/1,000,000 population measles incidence • National bodies and processes to support verification of measles elimination and rubella/CRS control is in place and functioning
STRATEGIC OBJECTIVE 3: Routine immunization systems and services strengthened	• National Immunization Policy published and widely available • cMYP is developed with priorities identified for reaching the un-reached or the under-served population • National plans of action for strengthening routine immunization is developed and implemented • Mid-term and End-Term Evaluations are conducted to generate evidence to show GAVI HSS grants have strengthened immunization services delivery infrastructure • 95% Penta-3 coverage at national level and at least 80% DTP3 coverage at municipality level • Cold chain and vaccine logistics capacity is assessed and national improvement plans developed and implemented • National capacity for vaccine management including regulatory mechanisms and management of AEFI is assessed and improvement plans developed and implemented
STRATEGIC OBJECTIVE 4: Introduction of new vaccines and related technologies accelerated	• Rota virus vaccine is introduced in 2015 • Implementation research priorities identified and research commissioned to identify barriers to immunization • National Committee for Immunization Practices (NCIP) and the National Immunization Technical Advisory Groups in place and

[27] Draft South-East Asia Region Immunization Strategic Plan, 2014-2017

	functioning effectively to provide guidance to introduce or not to introduce the following vaccines ○ Rota virus vaccine is introduced in 2015 ○ Japanese Encephalitis vaccine in 2018
STRATEGIC OBJECTIVE 5: Availability of safe and efficacious vaccines ensured	• National immunization program implements good distribution and storage practices • Pharmacovigilance and vaccine safety monitoring is in place. • Minimum levels of EVM standards are achieved
STRATEGIC OBJECTIVE 6: A functioning and effective VPD surveillance in place in all countries	• Burden of disease studies for Rotavirus, Human Papillomavirus (HPV), Japanese Encephalitis (JE) and Pneumococcal Pneumonia with cost analysis are conducted to provide case-based reports on selected VPDs • A robust VPD surveillance system is in place, and capacity is built for timely generation and use of quality data for better management of immunization program • Laboratory-based sentinel surveillance network is in place for a selected group of VPDs to generate quality data on emerging and new vaccine preventable diseases • Regular data exchange system and processes in place for the sharing of information with SEARO to ensure timely publication of Fact Sheets, Immunization Summaries, etc.
STRATEGIC OBJECTIVE 7: Strategic planning, resource coordination and management strengthened	• cMYP M&E framework in place for improved program performance monitoring and oversight of progress • Donor reports are available on time • Transparency and accountability in accordance with the government's procedures and processes enforced through period reviews and independent audits • Timely implementation of planned activities to ensure effective and efficient management of resources

The above stated cMYP deliverables, objectives and targets are fully aligned with directions stated in the National Strategic Development Plan (NSDP) 2011-2030 and the National Strategy on Reproductive, Maternal, Newborn, Child and Adolescent Health 2015-2019.

3 Implementation and M&E

3.1 Timelines for the cMYP

S. No	Objectives / Strategies / Activities	2016	2017	2018	2019	2020
ISC Objective 1:	Strengthen and optimize capacity of immunization service delivery					
Strategy 1.1:	Capacity building of Skilled Immunization Staff for all CHCs, Health Posts and Referral Hospitals					
Activity 1.1.1:	Train and sustain at least 3-member Health Post MCH Team on immunization practices and other immunization activities for every health post					
Activity 1.1.2:	Train and sustain at least 6-member CHC MCH Team (2Doctors + 2Nurses + 2Midwives) on immunization practices and other immunization activities for every CHC					
Activity 1.1.3:	Train and sustain at least 6-member MCH Team (2Doctors+2Nurses+2Midwives) on immunization practices and other immunization activities for every referral hospital					
Activity 1.1.4:	Conduct a package of integrated trainings for newborn care with immunization an essential component and train health care providers on: Essential Newborn Care, Community-based Newborn Care and Managing Newborn Problems					
Activity 1.1.5:	Establish Centers of Excellence in every municipality as sub-national training sites					
Strategy 1.2:	Capacity building of skilled immunization staff					
Activity 1.2.1:	Carry out induction trainings for newly recruited doctors, nurses and midwives in immunization practices, introduction of new vaccines, micro-planning, advocacy and awareness, surveillance (focusing on VPD surveillance) and reporting mechanisms etc.					
Activity 1.2.2:	Carry out refresher training for existing skilled immunization staff (doctor, nurse and midwife) in immunization practices, introduction of new vaccines, advocacy and awareness, surveillance and reporting mechanisms etc. at least once in 3 years					
Strategy 1.3:	Expansion in the existing coverage of EPI-fixed centers					

S. No	Objectives / Strategies / Activities	2016	2017	2018	2019	2020
Activity 1.3.1:	Establish EPI-Fixed centers in 78 Health Posts that are operational but without their own ILRs/cold chain equipment					
Activity 1.3.2:	Established EPI-Fixed centers in Health Posts that are to be established in uncovered areas (10 per year from 2017 onwards)					
Activity 1.3.3:	Involve private health sector and NGOs for expansion in the network of EPI-Fixed centers in private health care facilities					
Strategy 1.4:	Increase in performance/efficiency (effective coverage) of existing EPI Centers					
Activity 1.4.1:	Implement EPI Standards established under National EPI Strategy, Comprehensive Service Package for PHC and Guidelines for Domiciliary Visits					
Activity 1.4.2:	Mobilize additional qualified skilled immunization staff by training of newly appointed doctors and refresher courses for nurses and midwives					
Activity 1.4.3:	Improve micro-planning by increasing use of household listing through regular supportive supervision of designated staff at EPI centers					
Activity 1.4.4:	Improve data validation through field monitoring and supportive supervision					
Activity 1.4.5:	Regular use of integrated MCH/EPI micro-plan at CHCs and Health Posts					
Strategy 1.5:	Expansion in vaccination coverage for remote areas through effective outreach and mobile services					
Activity 1.5.1:	Identify the geographical areas not covered under that are difficult to reach for curative and preventive health services provided through CHCs and Health Posts					
Activity 1.5.2:	Identify and map geographical areas to be covered through outreach and mobile immunization services with focus on defaulter tracing					
Activity 1.5.3:	Prepare and implement area-specific outreach immunization micro plans integrated in MCH domiciliary visit plans for all the Sucos and Aldieas					

S. No	Objectives / Strategies / Activities	2016	2017	2018	2019	2020
Activity 1.5.4:	Increase number of outreach and mobile teams as per the requirement of the area specific micro-plans					
Activity 1.5.5:	Monitor and supervise outreach immunization services					
Strategy 1.6:	Implementation of Supplementary Immunization Activities (SIAs)					
Activity 1.6.1:	Conduct Measles campaign for children (9-59 months) in 2018 and with expected coverage of 95%					
Activity 1.6.2:	Conduct Japanese Encephalitis vaccine campaign for children (1-10 years) in 2018 with expected coverage of 95%					
Strategy 1.7:	Introduction of new vaccines in routine immunization schedule;2					
Activity 1.7.1:	Introduce Hep-B Birth Dose 2016					
Activity 1.7.2:	Introduce Measles-Rubella Vaccine with 2-dose schedule in 2016					
Activity 1.7.3:	Introduce DTP vaccine for children at the age of 18 months in 2016					
Activity 1.7.4:	Introduce DT vaccine for children at the age of 6 or entry in school in 2016					
Activity 1.7.5:	Introduce Rotavirus vaccine in 2018 after approval from NITAG					
ISC Objective 2:	Improve/sustain uninterrupted supply, quality, safety and utilization of vaccines, Injection equipment and other logistics to immunization service delivery					
Strategy 2.1:	Strengthening of Vaccine Logistic Management Information System					
Activity 2.1.1:	Regularly update inventory of exiting cold chain equipment and logistics (including date of installation/supply) by collecting data from national, municipality, CHC and Health Post levels					
Activity 2.1.2:	Develop and install 'Dash Board' for real time data monitoring on vaccine distribution through linking with National M&E System under DHIS-2					

S. No	Objectives / Strategies / Activities	2016	2017	2018	2019	2020
Activity 2.1.3:	Determine need for new supply and replacement of cold chain equipment and logistics at per the latest EVM assessment report 2015					
Activity 2.1.4:	Implement specifications and procurement plan as per EVM assessment report 2015 (aligned with the availability of funding)					
Strategy 2.2:	Expansion of existing cold chain and vaccine management for the introduction of new vaccines and opening of new service delivery facilities					
Activity 2.2.1:	Procure and install one cold room for National EPI Store					
Activity 2.2.2:	Procure and install Ice-lined Refrigerators for CHCs and Health Posts as per the criteria laid down in National Standard List of Vaccines and Cold Chain Equipment (128 new Health Posts during 2016-20)					
Activity 2.2.3:	Develop cold chain installation plan in alignment with national electrification plan for Sucos/health posts					
Activity 2.2.4:	Procure and supply other cold chain equipment including spare parts and toolkits for repair and maintenance					
Activity 2.2.5:	Train vaccine management personnel in logistic and vaccine management					
Activity 2.2.6:	Train technicians at Department of Medical Equipment and Maintenance for repair and maintenance of cold chain equipment					
Strategy 2.3:	Improve transportation of vaccines, injection equipment and other logistics					
Activity 2.3.1:	Forecast requirement of vaccines, injection supplies and other logistics at national, municipality and health facility levels					
Activity 2.3.2:	Monitor temperature maintenance during transportation by using digital records					
Strategy 2.4:	Up gradation of cold chain temperature monitoring and tracking system by using innovative IT technologies					
Activity 2.4.1:	Install and maintain Remote Temperature Monitoring Device (RTMD) System at national level					
Activity 2.4.2:	Procure and install 30-day electronic temperature logger devices for installation at municipality level and EPI-fixed centers					

S. No	Objectives / Strategies / Activities	2016	2017	2018	2019	2020
Activity 2.4.3:	Develop and install 'Dash Board' for temperature monitoring of cold rooms and integrate the system with online monitoring of vaccine stocks and distribution by linking with the National M&E System					
Strategy 2.5:	Improvement in vaccine management by implementing EVM Improvement Plan					
Activity 2.5.1:	Carry out EVM assessment every three years (next is due in 2018)					
Activity 2.5.2:	Revise the annual work plan in accordance with the EVM improvement plan based on the EVM Assessment Report 2015					
Activity 2.5.3:	Implement EVM improvement plan especially focusing on capacity building of cold chain management staff at all levels					
Activity 2.5.4:	Report on the progress of implementation of the EVM improvement Plan					
Strategy 2.6:	Expansion/up-gradation of transport system for field monitoring and supervision					
Activity 2.6.1:	Procure and supply one 4-wheel drive vehicle for field monitoring and supervisory staff at national level					
Activity 2.6.2:	Procure and supply motorbikes for field monitoring and supervision by Municipality Support Officers					
ISC Objective 3:	Performance of routine monitoring/reporting and disease surveillance improved					
Strategy 3.1:	Streamlining data collection and reporting practices through integration in DHIS-2					
Activity 3.1.1:	Assess main causes of data quality flaws and discrepancies between the existing Program-specific data recording registers and the reporting formats being used under National HMIS and M&E System					
Activity 3.1.2:	Develop an integrated system of data recording registers at the health facility develop thorough integrated in DHIS-2					
Activity 3.1.3:	Integrate EPI routine monitoring into mainstream data management					

S. No	Objectives / Strategies / Activities	2016	2017	2018	2019	2020
Activity 3.1.4:	Introduce regular system of formal feedback mechanism on the administrative reports of subordinated entities					
Activity 3.1.5:	Conduct periodic EPI progress/VPD surveillance reviews at national, municipality and CHC levels					
Strategy 3.2:	Strengthening accuracy of reporting through validation in field					
Activity 3.2.1:	Implement Central and Municipality Supportive Supervision program through quarterly and monthly field visits respectively					
Activity 3.2.2:	Conduct 3/30 cluster surveys for random coverage assessment					
Activity 3.2.3:	Conduct data validation through field monitoring visits					
Activity 3.2.4:	Conduct Data Quality Audit (DQA) and Data Quality Self-Assessment (DQS) at regular intervals					
Strategy 3.3:	Research, evidence generation and dissemination before introduction of new vaccines					
Activity 3.3.1:	Conduct burden of disease study for Rotavirus, Human Papillomavirus (HPV), Japanese Encephalitis (JE) and Pneumococcal Pneumonia with cost analysis					
Activity 3.3.2:	Publish and disseminate EPI annual progress report every year					
Strategy 3.4:	Expansion in surveillance network and coverage					
Activity 3.4.1:	Establish/strengthen sentinel surveillance system and capacity of national laboratory for Measles and Congenital Rubella Syndrome and conduct sero-surveys					
Activity 3.4.2:	Strengthen national laboratory for MR accreditation					
Activity 3.4.3:	Strengthen Adverse events following immunization (AEFI) surveillance under national vaccine pharmacovigilance					
Activity 3.4.4:	Support for National Committee activities required for verification of Polio and Measles Eradication and Elimination Certification					

S. No	Objectives / Strategies / Activities	2016	2017	2018	2019	2020
ISC Objective 4:	Knowledge and attitude toward immunization improved among target population					
Strategy 4.1:	Evaluation of barriers to access immunization services					
Activity 4.1.1:	Conduct formative research (KAP studies) of the target population regarding immunization					
Activity 4.1.2:	Assess the effectiveness of the communication strategies and existing community participation strategy					
Strategy 4.2:	Advocacy and partnership building					
Activity 4.2.1:	Organize two advocacy seminar for political leadership every year					
Activity 4.2.2:	Organize advocacy meetings with technical leadership of MoH, Ministry of Finance and Ministry of Education					
Activity 4.2.3:	Conduct advocacy meetings with political leadership and administration at national, municipal and suco levels					
Activity 4.2.4:	Conduct advocacy meetings with donors and philanthropists					
Activity 4.2.5:	Conduct at least one advocacy seminar for media/religious leaders including churches etc. every year					
Strategy 4.3:	Behavior change communication and mobilization					
Activity 4.3.1:	Standardize immunization related information and content materials					
Activity 4.3.2:	Reinforce promotion of positive attitude towards immunization through creating synergies between multiple channels of communication and MCH program strategies group as part of MoH PHC Home and Family Care Practices promotion for Health and Nutrition					
Activity 4.3.3:	Increase effectiveness of interpersonal communication by using the existing network of human resources, especially nurses, community midwives and village volunteers					

S. No	Objectives / Strategies / Activities	2016	2017	2018	2019	2020
Activity 4.3.4:	Activate social networks (community leaders, volunteers, women groups) and encourage peer communication to reach remote areas in order to disseminate information about the benefits of MNCH care and immunization					
Strategy 4.4:	Advocacy for resource mobilization for ensuring financial sustainability of immunization program					
Activity 4.4.1:	Use cMYP for financial projections on the 'funding gap' between existing resources and future requirements					
Activity 4.4.2:	Inform political and technical leadership about the importance of funding gap in terms of burden of morbidity and mortality due to vaccine preventable diseases					
Activity 4.4.3:	Mobilize political and technical leadership for increasing share for EPI-specific costs especially vaccines under national government budget					
Activity 4.4.4:	Develop financial projections for mobilizing donors and development partners on yearly basis					
ISC Objective 5:	Increase program management performance by strengthening the leadership capacity of Ministry of Health in immunization service delivery					
Strategy 5.1:	Increase number of managerial and supervisory staff and their capacity at different levels					
Activity 5.1.1:	Mobilize human resources from World Health Organization for technical assistance and continuous support					
Activity 5.1.2:	Mobilize human resources from UNICEF for technical assistance and continuous support					
Activity 5.1.3:	Advertise for and recruit one dedicated Cold Chain Manager at national level					
Activity 5.1.4:	Advertise for and recruit 7 Municipality Support Officers (1 per 2 districts in the mainland and one for Oecusse)					
Activity 5.1.5:	Conduct risk assessment workshop on maternal and neonatal elimination status					

S. No	Objectives / Strategies / Activities	2016	2017	2018	2019	2020
Activity 5.1.6:	Implement a cascade capacity building program for Mid-Level-Manager's (MLM) training for national and municipality managers, Municipality EPI Support Officers and other managerial staff on: Results-based Planning, achieving results and team working skills, MLM, RED/REC, EVM, Surveillance and outbreak investigation every three years					
Activity 5.1.7:	Train national and municipality EPI managers on orientation and implementation of cMYP					
Strategy 5.2:	Development and institutionalization of performance management system through integration and alignment with Health Sector Strategic Plan and National RMNCH Strategy					
Activity 5.2.1:	Establish new and strengthen existing EPI Management Teams at national, municipality and sucos levels					
Activity 5.2.2:	Set and implement EPI-specific Minimum Service Delivery Standards (EPI-MSDS) for national, municipal, and suco levels					
Activity 5.2.3:	Develop criteria/methodology for competency assessment and performance appraisal of key EPI management staff (managers and supervisors) and skilled immunization staff (doctors, nurses and midwives trained in vaccination)					
Activity 5.2.4:	Align indicators for measuring performance standards with national M&E system at all levels					
Activity 5.2.5:	Develop policy guidelines and standard operating procedures (SOPs) for EPI-fixed centers in private health facilities					
Activity 5.2.6:	Establish National Committee on Causality Assessment					
Strategy 5.3:	Streamlining EPI planning processes					
Activity 5.3.1:	Develop EPI annual implementation plans integrated with MCH program and service package for domiciliary health services					
Activity 5.3.2:	Review and align cMYP with EPI annual implementation plan processes					

S. No	Objectives / Strategies / Activities	2016	2017	2018	2019	2020
Activity 5.3.3:	Develop annual plans for: capacity building, HR recruitment, EPI service delivery expansion and infrastructure development, cold chain replacement, vaccine/logistic distribution, communication and advocacy, emergency and disaster like situations, M&E, Measles Elimination and Control of rubella/congenital rubella syndrome	■	■	■	■	■
Strategy 5.4:	Streamlining accountability mechanisms at program management levels (national, municipal and suco levels)					
Activity 5.4.1:	Conduct biennial EPI reviews at national level	■	■	■	■	■
Activity 5.4.2:	Conduct quarterly EPI performance reviews at municipal level	■	■	■	■	■
Activity 5.4.3:	Conduct monthly EPI performance reviews at CHC level	■	■	■	■	■
Activity 5.4.4:	Conduct annual performance appraisal of all EPI management and supervisory staff and skilled immunization staff		■	■	■	■
Activity 5.4.5:	Conduct competency assessment of all EPI management and supervisory staff and skilled immunization staff every three years		■			■
Activity 5.4.6:	Conduct mid-term and end-term evaluations of GAVI HSS Grant	■		■		
Activity 5.4.7:	Conduct annual independent audit of GAVI HSS Grant	■	■	■		
Strategy 5.5:	Minimize wastage of resources under immunization program					
Activity 5.5.1:	Rationalize use of POL for monitoring and supervision by management staff at all levels	■				
Activity 5.5.2:	Develop and introduce need-based supply of vaccines, syringes and other materials by incorporating bundling approach	■				
Activity 5.5.3:	Determine and minimize vaccine wastages and drop-out rates for different antigens	■	■			
Strategy 5.6:	Increase in effectiveness of trainings of EPI managerial, supervisory and skilled immunization staff					
Activity 5.6.1:	Introduce training need assessment, and pre & post trainings assessment as a mandatory requirement of training programs	■				

S. No	Objectives / Strategies / Activities	2016	2017	2018	2019	2020
Activity 5.6.2:	Revise training materials as and when required under training need assessment reports					
Activity 5.6.3:	Maintain database for training programs and compare training outcomes prior to conducting follow up trainings					
Strategy 5.7:	Increase motivation of key staff of the immunization program					
Activity 5.7.1:	Arrange overseas study tours for national, municipality EPI managers and CHC staff					
Activity 5.7.2:	Develop a scheme on financial and non-financial incentives (carrier growth opportunities, performance based incentives etc.)					
Activity 5.7.3:	Explore possibilities for financing and implementation					

3.2 Monitoring and Evaluation

3.2.1 M&E Framework for Immunization

			Baseline			Targets					Means of verification
			Result	Year	Source	2016	2017	2018	2019	2020	
Goal	#	**Impact Indicator**									
Decrease VPD related morbidity and mortality	1	Cases of measles per 1 million population	41	2014	Program Data	21	11	5	5	5	Program Data, Independent survey
	2	Cases of neonatal tetanus	1	2014	Program Data	0	0	0	0	0	Program Data, Independent survey
	3	Cases of Polio	0	2014	Program Data	0	0	0	0	0	Program Data, Independent survey
	4	Cases of diphtheria	2	2014	Program Data	4	4	3	3	3	Program Data, Independent survey
Immunization system Objective	#	**Outcome indicators**									
Improve performance of the immunization system	1	BCG coverage	79%	2014	WHO-UNICEF Estimates	87%	90%	90%	95%	95%	Program Data; DHS; WHO-UNICEF Estimates
	2	Hep-B birth dose coverage	NA	2014		60%	65%	70%	75%	80%	Program Data; DHS;

			Baseline			Targets					Means of verification
			Result	Year	Source	2016	2017	2018	2019	2020	
											WHO-UNICEF Estimates
	3	OPV-0 dose coverage	57.4%	2014	APR-2014	60%	65%	70%	75%	80%	Program Data; DHS; WHO-UNICEF Estimates
	4	OPV3 coverage	76%	2014	WHO-UNICEF Estimates	87%	90%	90%	95%	95%	Program Data; DHS; WHO-UNICEF Estimates
	5	Penta3 coverage	77%	2014	WHO-UNICEF Estimates	87%	90%	90%	95%	95%	Program Data; DHS; WHO-UNICEF Estimates
	6	IPV coverage	NA	2014		87%	90%	90%	95%	95%	Program Data; DHS; WHO-UNICEF Estimates
	7	Rota vaccine coverage	NA	2014				60%	70%	80%	Program Data; DHS; WHO-UNICEF Estimates
	8	Measles-Rubella-1 coverage	74%	2014	WHO-UNICEF Estimates	82%	86%	90%	95%	95%	Program Data; DHS; WHO-UNICEF

			Baseline			Targets					Means of verification
			Result	Year	Source	2016	2017	2018	2019	2020	
											Estimates
	9	DTP coverage	NA	2014		30%	40%	50%	60%	80%	Program Data; DHS; WHO-UNICEF Estimates
	10	Measles-Rubella-2 coverage	NA	2014		30%	40%	50%	60%	80%	Program Data; DHS; WHO-UNICEF Estimates
	11	DT coverage	NA	2014		20%	30%	40%	50%	60%	Program Data; DHS; WHO-UNICEF Estimates
	12	TT 2+ coverage	81%	2014	WHO-UNICEF Estimates	83%	85%	87%	90%	90%	Program Data; DHS; WHO-UNICEF Estimates
	13	Children fully immunized (under 1 year)	57.9%	2014	APR-2014	80%	85%	90%	95%	95%	Program Data; DHS
	14	Children fully immunized (5-6 year)	NA	2014		20%	30%	40%	50%	60%	Program Data; DHS
	15	Dropout rate between Penta1 and Penta3 coverage	4.9%	2014	WHO-UNICEF Estimates	2.2%	2.2%	0%	0%	0%	Program Data; DHS
	16	Dropout rate between BCG and MR-1 coverage	6.2%	2014	WHO-UNICEF Estimates	5.6%	4.3%	0%	0%	0%	Program Data; DHS

			Baseline			Targets					Means of verification
			Result	Year	Source	2016	2017	2018	2019	2020	
	17	Geographical equity: % of districts that have at or above 80% Penta3 coverage	46.2%	2014	APR-2014	53.8%	76.9%	92.3%	92.3%	92.3%	Program Data
	18	Geographical equity: % of districts that have at or above 90% Penta3 coverage	23.1%	2014	APR-2014	38.5%	69.2%	84.6%	92.3%	92.3%	Program Data
Immunization system component Objectives	#	**ISC specific objective indicators**									
ISC Objective 1: Strengthen and optimize capacity of immunization service delivery	1	Proportion of health care facilities not having EPI centers decreased to zero	25%	2015	Program Data	25%	15%	5%	0%	0%	Annual EPI Report
	2	Proportion of Fixed-EPI centers not having Skilled Immunization Staff (SIS) decreased to zero	0%	2015	Program Data	0%	0%	0%	0%	0%	Annual EPI Report
	3	Proportion of municipalities with Centers of Excellence established	0%	2015	Program Data	20%	30%	35%	40%	50%	Annual EPI Report
Strategy 1.1: Capacity building of Skilled Immunization Staff for all CHCs, Health Posts and Referral Hospitals	1	No. of Health Posts with 3-member Health Post MCH Team (Doctor+Nurse+Midwife) trained on EPI	163	2014	Program Data	202	251	261	271	281	Program Data
	2	No. of CHCs with 6-member MCH Team (2Doctor+2Nurse+2Midwife) trained on EPI	67	2014	Program Data	69	69	69	69	69	Program Data
	3	No. of Referral Hospitals with 6-member MCH Team	6	2014	Program	6	6	6	6	6	Program

			Baseline			Targets					Means of verification
			Result	Year	Source	2016	2017	2018	2019	2020	
		(2Doctor+2Nurse+2Midwife) trained on EPI			Data						Data
	4	No. of trainings conducted on newborn care with immunization an essential component (35 participants per training)	NA	2014	Program Data	10	10	14	10	10	Training Reports
	5	No. of Municipalities having a functional Center of Excellence as sub-national training sites	0	2014	Program Data	2	3	4	5	6	Annual EPI Report
Strategy 1.2: Capacity building of skilled immunization staff	1	No. of induction trainings (EPI) conducted for newly doctors, nurses and midwives (35 persons per training)	No Data	2014	Program Data	5	2				Training Reports
	2	Number of refresher trainings conducted for existing skilled immunization staff (35 persons per training)	No Data	2014	Program Data	10	10	14	10	10	Training Reports
Strategy 1.3: Expansion in the existing coverage of EPI-fixed centers	1	Number of EPI-Fixed centers established in HPs that are operational but without their own ILRs/cold chain equipment	No Data	2014	Program Data	39	39				Annual EPI Report
	2	No. of EPI-Fixed centers established in new HPs in uncovered areas	No Data	2014	Program Data		10	10	10	10	Annual EPI Report

			Baseline			Targets					Means of verification
			Result	Year	Source	2016	2017	2018	2019	2020	
Strategy 1.4: Increase in performance/efficiency (effective coverage) of existing EPI Centers	1	Proportion of health facilities observing EPI service delivery standards established under National Guidelines	No	2014	Program Data	50%	70%	80%	90%	100%	Annual EPI Report
Strategy 1.5: Expansion in vaccination coverage for remote areas through effective outreach and mobile services	1	Proportion of Sucos being covered by using area-specific EPI micro plans	No	2014	Program Data	80%	95%	95%	95%	95%	Program Data
Strategy 1.6: Implementation of Supplementary Immunization Activities (SIAs)	1	Coverage of Measles campaign for children (9-59 months)	No	2014	Program Data			95%			Program Data; Post-campaign assessment
	2	Coverage of Japanese Encephalitis vaccine campaign for children (1-10 years)	No	2014	Program Data			95%			Program Data; Post-campaign assessment
Strategy 1.7: Introduction of new vaccines in routine immunization schedule	1	Introduce Hep-B Birth Dose introduced	No	2014	Program Data	√					Program Data; Post-campaign assessment
	2	Measles-Rubella Vaccine with 2-dose schedule introduced	No	2014	Program Data	√					Annual EPI Report
	3	DTP vaccine for children at	No	2014	Program	√					Annual EPI

			Baseline			Targets					Means of verification
			Result	Year	Source	2016	2017	2018	2019	2020	
		the age of 18 months introduced			Data						Report
	4	DT vaccine for children at the age of 6 or entry in school introduced	No	2014	Program Data	√					Annual EPI Report
	5	Rotavirus vaccine introduced subject to approval from NITAG	No	2014	Program Data			√			Annual EPI Report
ISC Objective 2: Improve/sustain uninterrupted supply, quality, safety and utilization of vaccines, Injection equipment and other logistics to immunization service delivery	1	Stock out at facility level	0%	2014	Program Data	0%	0%	0%	0%	0%	Program Data, Report of expert panel
	2	National EPI store with average EVM score above 90%	49%	2015	EVM Assessment Report	√	√	√	√	√	Program Data, EVM Assessment Report
	3	Proportions of municipality EPI stores with average EVM score above 80%	No Data	2015	Program Data	30%	50%	60%	70%	80%	Program Data, EVM Assessment Report
	4	Proportion of CHC EPI stores with average EVM score above 80%	No Data	2015	Program Data	25%	35%	45%	60%	70%	Program Data, EVM Assessment Report
	5	Proportion of Health Post EPI stores with average EVM score above 80%	No Data	2015	Program Data	25%	35%	45%	60%	70%	Program Data, EVM Assessment Report

			Baseline			Targets					Means of verification
			Result	Year	Source	2016	2017	2018	2019	2020	
Strategy 2.1: Strengthening of Vaccine Logistic Management Information System	1	Develop and install 'Dash Board' for real time data monitoring on vaccine distribution installed	No	2014	Program Data	√					Program Data
	2	Cold chain replacement plan developed at per the latest EVM assessment report 2015	√	2014	Program Data	√					Cold Chain Replacement Plan Document
Strategy 2.2: Expansion of existing cold chain and vaccine management for the introduction of new vaccines and opening of new service delivery facilities	1	Number of new cold rooms installed in National EPI Store	0	2014	Program Data	1					Cold Chain Replacement Plan Implementation Report
	2	No. of ILRs installed in CHCs and Health Posts as per National Standards	280	2015	Program Data	39	49	10	10	10	Cold Chain Replacement Plan Implementation Report
	3	Cold chain installation plan developed in alignment with national electrification plan for Sucos/health posts	√	2015	Program Data	√	√	√	√	√	Cold Chain Replacement Plan
	4	Number of trainings conducted for vaccine management personnel trained in logistic and vaccine management (35 persons per training)	No Data	2014	Program Data	5	5		5	5	Training Reports
	5	Number of trainings conducted for training technicians at Department of	No Data	2014	Program Data	1			1		Training Reports

			Baseline			Targets					Means of verification
			Result	Year	Source	2016	2017	2018	2019	2020	
		Medical Equipment and Maintenance for repair and maintenance of cold chain equipment (15 persons per training)									
Strategy 2.3: Improve transportation of vaccines, injection equipment and other logistics	1	Requirement of vaccines, injection supplies and other logistics forecasted at national, municipality and health facility levels	√	2014	Program Data	√	√	√	√	√	Vaccine & Logistics Forecast Report
	2	Proportion of reports submitted for monitoring of temperature maintenance during transportation by using digital records	No Data	2014	Program Data	100%	100%	100%	100%	100%	Program Data
Strategy 2.4: Up gradation of cold chain temperature monitoring and tracking system by using innovative IT technologies	1	Remote Temperature Monitoring Device (RTMD) System installed at national level	NA	2015	Program Data	√					Cold Chain Replacement Plan Implementation Report
	2	Proportion of Fixed EPI Centers with functional 30-day electronic temperature logger devices installed	NA	2015	Program Data	100%	100%	100%	100%	100%	Cold Chain Replacement Plan Implementation Report
	3	'Dash Board' for temperature monitoring of cold rooms and online monitoring of vaccine stocks and distribution developed and	NA	2015	Program Data		√				Cold Chain Replacement Plan Implementation Report

			Baseline			Targets					Means of verification
			Result	Year	Source	2016	2017	2018	2019	2020	
		with the National M&E System									
Strategy 2.5: Improvement in vaccine management by implementing EVM Improvement Plan	1	EVM assessment conducted	√	2015	Program Data				√		EVM Assessment Report
	2	Annual EVM improvement plan developed	√	2015	Program Data	√	√	√	√	√	EVM Improvement Plan
	3	EVM improvement Plan implemented	√	2015	Program Data	√	√	√	√	√	EVM Improvement Implementation Report
Strategy 2.6: Expansion/up-gradation of transport system for field monitoring and supervision	1	No. of 4-wheel drive vehicle procured and supplied for field monitoring and supervisory staff at national level	NA	2014	Program Data	1					Program Data
	2	No. of motorbikes procured and supplied for field monitoring and supervision by Municipality Support Officers	NA	2014	Program Data	13					Program Data
ISC Objective 3: Performance of routine monitoring/reporting and disease	1	Proportion of reporting units receiving satisfactory DQS score	No Data	2014	Program Data	50%	60%	70%	80%	80%	Program Data
	2	Proportion of reporting units submitting their reports	91%	2014	Program Data	95%	100%	100%	100%	100%	Program Data, Report

			Baseline			Targets					Means of verification
			Result	Year	Source	2016	2017	2018	2019	2020	
surveillance improved		within stipulated time period									of expert panel
	3	Proportion of submitted reports are completely filled	No Data	2014	Program Data	65%	75%	85%	95%	95%	Program Data
	4	Drop-out rate between Penta-1 and Penta-3 remains less than 3%	4.9%	2014	Program Data	2.2%	2.2%	0%	0%	0%	Program Data
	5	Minimum number of non-polio AFP cases per 100,000 population are detected and reported	<1	2014	Program Data	2	2	2	2	2	Program Data
	6	Minimum number of discarded non-measles cases per 100,000 population are detected and reported	No Data	2014	Program Data	2	2	2	2	2	Program Data
Strategy 3.1: Streamlining data collection and reporting practices through integration in DHIS-2	1	Data recording registers at the health facility integrated with DHIS-2	No	2014	Program Data		√				Program Data
	2	Proportion of administrative units providing formal feedback on periodic reports of subordinated entities	No Data	2015	Program Data	70%	90%	100%	100%	100%	Program Data
	3	Periodic EPI progress/VPD surveillance reviews conducted at national, municipality and CHC levels	1	2015	Program Data	√	√	√	√	√	Review Report
Strategy 3.2: Strengthening accuracy	1	3/30 cluster surveys conducted vs. planned for	NA	2015	Program Data	√	√	√	√	√	Program Data

			Baseline			Targets					Means of verification
			Result	Year	Source	2016	2017	2018	2019	2020	
of reporting through validation in field		random coverage assessment									
	2	Proportion of field monitoring visits conducted with data validation	NA	2015	Program Data	100%	100%	100%	100%	100%	Program Data
	3	Data Quality Audit (DQA) and Data Quality Self-Assessment (DQS) conducted as per plan	NA	2015	Program Data	√	√	√	√	√	Review Report
Strategy 3.3: Research, evidence generation and dissemination before introduction of new vaccines	1	Burden of disease studied for Rotavirus, Human Papillomavirus (HPV), Japanese Encephalitis (JE) and Pneumococcal Pneumonia with cost analysis	NA	2015	Program Data	√	√	√			BoD Reports
	2	EPI annual progress report published and disseminated	No	2015	Program Data	√	√	√	√	√	Annual EPI Progress Report
Strategy 3.4: Expansion in surveillance network and coverage	1	Sero-surveys conducted	NA	2015	Program Data	√	√				Survey Report
ISC Objective 4: Knowledge and attitude toward immunization improved among target population	1	% of parents with children under 1 year of age aware of at least two benefits of immunization is increased by 25% from the baseline	No Data	2015	Program Data	5% increase from baseline	10% increase from baseline	15% increase from baseline	20% increase from baseline	25% increase from baseline	Program Data

			Baseline			Targets					Means of verification
			Result	Year	Source	2016	2017	2018	2019	2020	
	2	% of parents with children under 1 year of age who can identify the nearest immunization center is increased by 25% from the baseline	No Data	2015	Program Data	5% increase from baseline	10% increase from baseline	15% increase from baseline	20% increase from baseline	25% increase from baseline	Program Data
	3	Coverage targets and objectives are revised/adjusted to the availability of funding	No Data	2015	Program Data	√	√	√	√	√	Annual EPI Plan
Strategy 4.1: Evaluation of barriers to access immunization services	1	Formative research (KAP studies) conducted	√	2015	Program Data	√	√				Study Report
	2	Effectiveness of the communication strategies and existing community participation strategy is assessed	NA	2015	Program Data		√				Study Report
Strategy 4.2: Advocacy and partnership building	1	Number of advocacy seminars organized for political leadership	No Data	2015	Program Data	2	2	2	2	2	Activity Report
	2	Number of advocacy seminar organized for media/religious leaders including churches etc.	No Data	2015	Program Data	1	1	1	1	1	Activity Report
Strategy 4.3: Behavior change communication and mobilization	1	Immunization related information and content materials standardized	No Data	2015	Program Data	√	√				Program Data

			Baseline			Targets					Means of verification
			Result	Year	Source	2016	2017	2018	2019	2020	
Strategy 4.4: Advocacy for resource mobilization for ensuring financial sustainability of immunization program	1	Financial projections on the 'funding gap' between existing resources and future requirements developed and shared	√	2015	Program Data	√	√	√	√	√	Annual Report on Funding Gap Analysis
ISC Objective 5: Increase program management performance by strengthening the leadership capacity of Ministry of Health in immunization service delivery	1	Integrated EPI annual plans are developed and consistent with the National RMNCH Strategy and cMYP 2016-2020	NA	2015	Program Data	√	√	√	√	√	Integrated EPI Plan
	2	Annual progress report is produced and discussed with key stakeholders every year	NA	2015	Program Data	1	1	1	1	1	Annual EPI Progress Report
	3	The cMYP is updated regularly reflecting either changes in the context (epidemiological, vaccine availability, etc.), resource availability or immunization system outcomes (achievements)	√	2015	Program Data	√	√	√	√	√	cMYP Document
	4	Minimum number of meetings held demonstrating contribution of EPI partners to the decision-making	No Data	2015	Program Data	2	2	2	2	2	Minutes of Meetings
	5	Proportion of managerial and technical positions are staffed with qualified human resource	NA	2015	Program Data	90%	95%	95%	95%	95%	EPI HR Reports

			Baseline			Targets					Means of verification
			Result	Year	Source	2016	2017	2018	2019	2020	
Strategy 5.1: Increase number of managerial and supervisory staff and their capacity at different levels	1	One dedicated Cold Chain Manager available at national level	NA	2015	Program Data	1	1	1	1	1	EPI HR Reports
	2	Number of Municipality Support Officers recruited (1 per 2 districts in the mainland and one for Oecusse)	NA	2015	Program Data	7					EPI HR Reports
	3	Risk assessment workshop on maternal and neonatal elimination status conducted	NA	2015	Program Data	√					Workshop Report
	4	A cascade capacity building program for Mid-Level-Manager's (MLM) implemented	NA	2015	Program Data	√	√	√	√	√	Training Reports
	5	National and municipality EPI managers trained on orientation and implementation of cMYP (35 persons per training)	NA	2015	Program Data	√					Training Report
Strategy 5.2: Development and institutionalization of performance management system through integration and alignment with Health Sector Strategic Plan and National RMNCH	1	EPI-specific Minimum Service Delivery Standards (EPI-MSDS) developed for national, municipal, and suco levels	NA	2015	Program Data	√					EPI MSDS Document
	2	Criteria/methodology for competency assessment and performance appraisal of EPI management and skilled	NA	2015	Program Data	√					Assessment Guidelines and Tools

			Baseline			Targets					Means of verification
			Result	Year	Source	2016	2017	2018	2019	2020	
Strategy		immunization staff developed									
	3	Indicators for measuring performance standards aligned with national M&E system at all levels	NA	2015	Program Data	√					List of Indicators
	4	Policy guidelines and standard operating procedures (SOPs)for establishing EPI-fixed centers in private health facilities developed	NA	2015	Program Data		√				SOP Document
	5	National Committee on Causality Assessment established	NA	2015	Program Data		√				Annual EPI Progress Report
Strategy 5.3: Streamlining EPI planning processes	1	EPI annual implementation plans integrated with MCH program and service package for domiciliary health services developed	No	2014	Program Data	√	√	√	√	√	Annual EPI Progress Report
	2	cMYP reviewed and aligned with EPI annual implementation plan processes	No	2014	Program Data		√	√	√	√	cMYP Document
Strategy 5.4: Streamlining accountability mechanisms at program management levels	1	Number of EPI reviews at conducted national level	No Data	2014	Program Data	2	2	2	2	2	Review Reports
	2	Number of Quarterly EPI performance reviews conducted at municipal level	No Data	2014	Program Data	52	52	52	52	52	Review Reports

			Baseline			Targets					Means of verification
			Result	Year	Source	2016	2017	2018	2019	2020	
(national, municipal and suco levels)	3	Number of monthly EPI performance reviews conducted at CHC level	No Data	2014	Program Data	828	828	828	828	828	Review Reports
	4	Annual performance appraisal conducted of all EPI management and supervisory staff and skilled immunization staff	No	2015	Program Data	√	√	√	√	√	Assessment Report
	5	Competency assessment of all EPI management and supervisory staff and skilled immunization staff conducted	NA	2015	Program Data		√			√	Assessment Report
	6	Mid-term and end-term evaluations of GAVI HSS Grant conducted	NA	2015	Program Data	√		√	√	√	GAVI Evaluation Reports
	7	Annual independent audit of GAVI HSS Grant conducted	No	2015	Program Data	√	√	√			Audit Reports
Strategy 5.5: Minimize wastage of resources under immunization program	1	Vaccine wastages for different antigens established	NA	2015	Program Data	√	√				Program Data
Strategy 5.6: Increase in effectiveness of trainings of EPI managerial, supervisory and skilled immunization staff	1	Training need assessment, and pre & post trainings assessment introduced as a mandatory requirement of training programs	NA	2015	Program Data	√					Government Notification
	2	Database for training	NA	2015	Program	√					Training

			Baseline			Targets					Means of verification
			Result	Year	Source	2016	2017	2018	2019	2020	
		programs developed			Data						Reports
Strategy 5.7: Increase motivation of key staff of the immunization program	1	Overseas study tours arranged for national, municipality EPI managers and CHC staff	NA	2015	Program Data	√	√	√	√	√	Activity Reports
	2	Scheme on financial and non-financial incentives (carrier growth opportunities, performance based incentives etc.) developed	NA	2015	Program Data	√	√				Program Document

3.2.2 Monitoring and Evaluation Strategy and Plan

The M&E Framework is the essential instrument that the immunization program will use for tracking the performance of cMYP in Timor-Leste. The quantifiable indicators are grouped under three broad areas: impact, outcomes and immunization-system-component-specific (ICS) indicators.

The impact and outcomes indicators will facilitate in linking Timor-Leste cMYP with the broader national plans. These will reflect whether the planners and funders are getting value for money.

The ICS indicators will be used to link the inputs, processes and outputs. The main sources of information include EPI MIS, Health Management Information System and other administrative data. In addition to these health sector-specific data sources, Demographic and Health Survey and other periodic survey will provide the information that is not covered under public health sector.

The M&E Framework will be used in planning and decision making while developing new grant proposals, revisiting cMYP, and conducting periodic reviews at national and sub-national levels. It will also be used to negotiate the resource requirement from the Timor-Leste government, donors and development partners.

The National EPI Manager will be responsible for maintaining and updating the information required for M&E Framework by developing a Plan of Action for tracking implementation of cMYP. Monitoring and evaluation of the Plan of Action will be an essential component of cMYP. The program implementers will primarily be focusing on three areas:

1. Program Inputs (human resources, finances and materials)
2. Processes (procedures of carrying out strategy-specific activities)
3. Immediate Outputs (expected deliverables)

The main purpose is to critically and systematically review:

- The extent to which inputs (human resources, finances and materials) are actually being made available and utilized against what was targeted as per plan in a given quarter.
- The procedures and timeliness of processes of program activities are being observed as per plan in order to translate inputs into outputs in a given quarter.
- The degree to which immediate outputs are achieved against the targets to be accomplished in a given quarter.

Such a critical review will enable EPI program implementers and partners to examine and analyze:

- Resource availability and utilization
- Bottle-necks, faults in implementation, or best practices
- Degree and speed of achieving program targets

This evidence will help 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 or improved, where and when required.

4 Immunization Program Costing and Financing

4.1 Macroeconomic context and demographics

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

- GDP per capita annual growth rate was set at 2.36% based on:
  - 5.1% GDP annual growth rate in accordance with the Ministry of Finance's forecasts (including non-oil GDP growth in the 4.1%-7.5% range in the medium term[28].
  - Population annual growth rate of 2.68% in accordance with the World Bank (World Development Indicators database)
- GDP per capita (in current US$) was estimated at 1,169 in 2014 (according to the World Bank World Development Indicator database) as shown in Figure 51 (on page 101)
- Total Health Expenditure (THE) per capita was 58.9 US$ 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 (2.36%) as described above
- GHE as % of THE – constant value at the rate for 2013 – 91.7%.
- Inflation rate (Consumer price index) was 0.44% in 2014, down from 11-13% in previous 3 years; 2% inflation rate was used to project

The total population was estimated at 1,167,242 in 2015 (in accordance with Census 2015 preliminary findings):

- The population growth was projected at the annual growth rate of 1.81%.
- Infant mortality rate was 46.1 in 2014 and 44.7 in 2015 per 1000 live birth in accordance with the WB WDI database
- According to the JRF 2014:
  - The number of surviving infants was 40,351 in 2014, that translates into 42,301 newborns at the infant mortality rate of 46.1 per 1,000 live births (that is 3.49% of the total population in 2014)
  - The number of pregnant women was 48,316 in 2014, that translates into 1.14 birth factor

4.2 Current program costs and financing

4.2.1 Expenditures on immunization in the baseline year

The national immunization program expenditures in 2014 amounted to 2.36 million US$ as shown in Figure 16 below:

Figure 16: Baseline Indicators (2014)

Total Immunization Specific Expenditures	**$1,610,984**
Supplemental immunization activities	$0
Routine immunization only	$1,610,984
Per capita	$1.38
Per DTP3 immunized child	$54

[28] Ministerio das Fianancas. Cabinet Minterial. Repbulica Democratica de Timro-Leste. State Budget 2016. Budget Overview. Book 1.

% Vaccines and Supplies	25.66%
% Government Funding	39.69%
% Of Total Health Expenditures (THE)	2.34%
% Government Health Expenditures	2.56%
% GDP	0.12%
Total shared costs	**$749,313**
% Shared Health Systems Cost	31.75%
Total Immunization Expenditures	**$2,360,297**

No supplementary immunization activity was conducted in 2014.

Shared health system costs (750 thousand US$) accounted for one third of the immunization expenditures and the rest was spent specifically on routine immunization. The cost of fully (DTP3) immunized child was US$.

2.34% of the total health expenditures (or 2.56% of the government health expenditure) was spent on routine immunization.

Vaccines and injection supplies were the major cost driver accounting for 27% of all expenditures as shown in Figure 17 below:

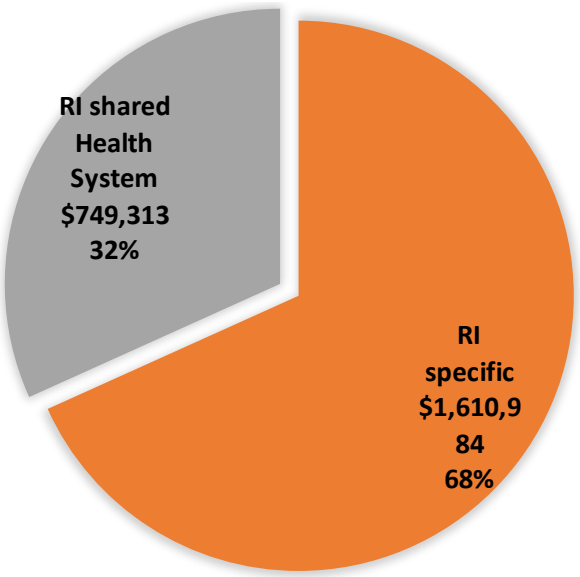


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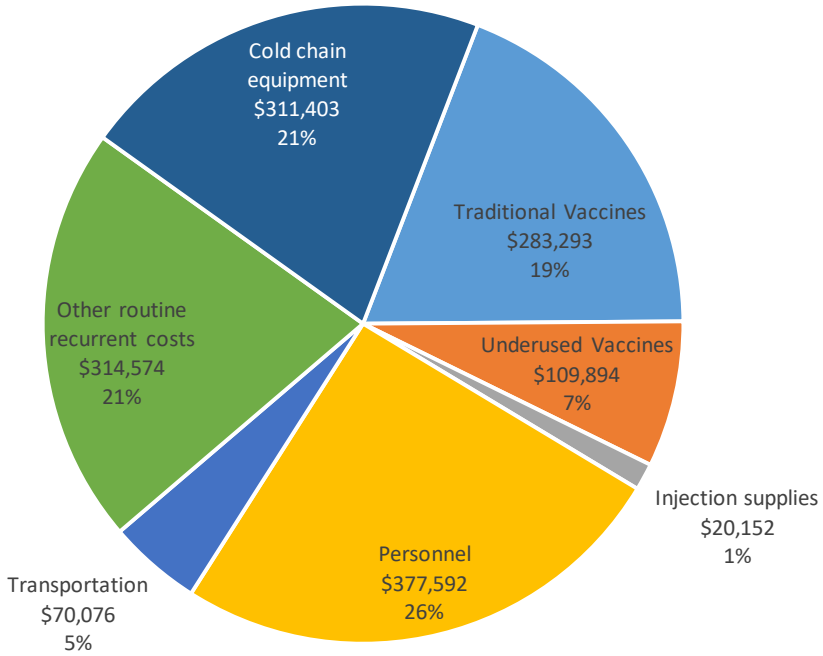
Figure 17: Routine Immunization baseline cost structure



Immunization specific ("dedicated") labor costs (377 thousand US$) were the second major cost driver accounting for 26% of the total expenditures, followed by "Other Routine Recurrent Costs" (21%) and investment in cold chain (21%).

4.2.2 Routine immunization cost structure

(1) Personnel

The majority of the total of 1,259 persons engaged in the national immunization program were shared health system personnel (allocating some portion of work time to immunization) and only 8 persons at the national level dedicated full work time to immunization as shown in Figure 38 (on page 92).

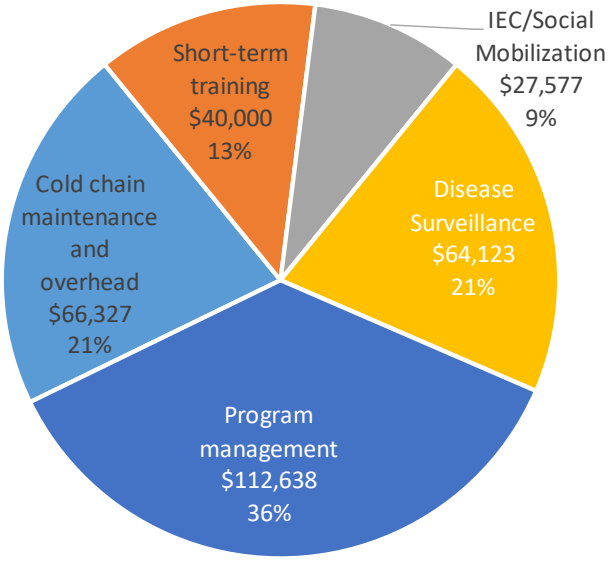
(2) Vaccines

According to APR 2014, 283,293 US$ were spent on traditional vaccines and 109,843 US$ - on underused vaccines in 2014; the total expenditures on vaccines and injection supplied amounted to 413,339 US$.

(3) Other Routine Recurrent Costs

Program management accounted for 36% of "Other Routine Recurrent Costs" as shown in Figure 18 below:

Figure 18: Other routine recurrent cost structure



64 thousand US$ were spent on diseases surveillance (21% of "Other Routine Recurrent Costs") and 66.3 thousand US$ were spent on cold chain maintenance and overheads (21%).

Short-term trainings accounted for 13% of "Other Routine Recurrent Costs" (40 thousand US$).

(4) Vehicles and transportation

Transportation expenditures amounted to 70 thousand US$ in 2014 that constituted 4.35% of the total recurrent expenditures on routine immunization: 66.7 thousand US$ were spent on the distribution of vaccines to fixed service delivery sites and 3.3 thousand US$ (or 5% of the total transportation expenditures) – on mobile service delivery.

Fuels cost in baseline year was estimated at 1.6 U$ per liter (for diesel, in accordance with the WB WDI database).

124 thousand US$ were invested in vehicles in 2014 (62 motorcycles purchased in 2014).

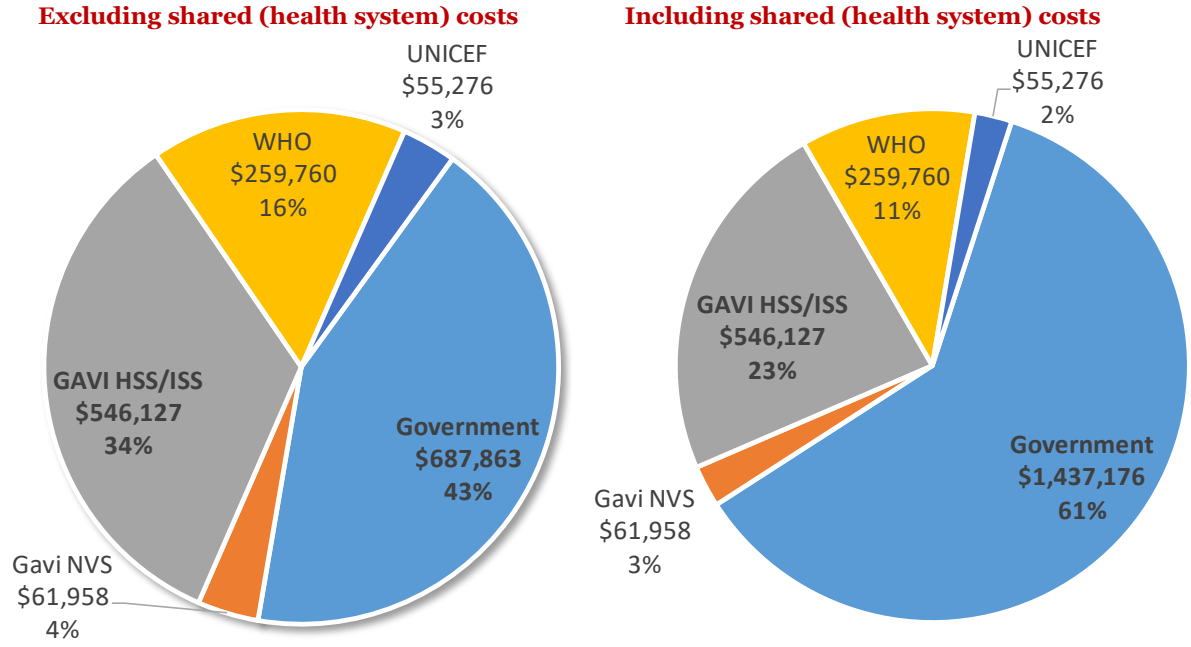
4.2.3 Supplementary immunization costs

No SIA was conducted in 2014.

4.2.4 Immunization financing in baseline year

The Government was the major source of financing of the national immunization program accounting for 43% of all funds if shared health system costs are excluded and 61% if shared health system costs are included as shown in Figure 19 below:

Figure 19: Immunization financing profile – baseline year



Gavi was the second major source of funding through NVS (61 thousand US$) and HSS ($546 thousand) windows accounting for 30% of the total funding (excluding shared costs).

4.3 Future resource requirements

4.3.1 Overview of the resource requirements' structure

The total resource requirements were estimated at 16.2 million US$ (including shared health system costs) for 2016-2020 as shown in Figure 20 below:

Figure 20: National immunization program costs summary by system components and years – basic scenario

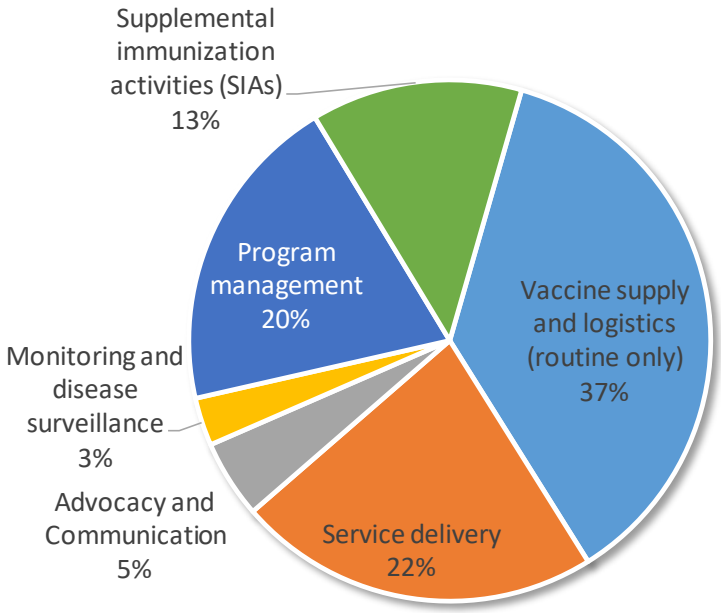
Immunization system components	Expenditures	Future resource requirements					Total 2016 -
	2014	2016	2017	2018	2019	2020	2020
Vaccine supply and logistics (routine only)	918,979	775,617	738,758	897,409	956,582	1,010,651	**4,379,017**
Service delivery	435,788	539,520	557,802	576,598	505,000	509,800	**2,688,720**
Advocacy and Communication	27,577	123,624	196,428	220,758	18,618	18,990	**578,417**
Monitoring and disease surveillance	76,003	89,516	83,598	61,773	61,060	60,294	**356,241**
Program management	152,638	577,827	717,929	691,050	199,689	192,554	**2,379,049**
Supplemental immunization activities (SIAs)	0	0	0	1,563,557	0	0	**1,563,557**
Total immunization Immunization costs	**1,610,984**	**2,106,105**	**2,294,514**	**4,011,145**	**1,740,949**	**1,792,289**	**11,945,002**
Shared Health Systems Costs (EPI Portion)	749,313	786,698	821,472	857,321	894,276	932,366	**4,292,134**
Total immunization resource requirements	**2,360,297**	**2,892,803**	**3,115,986**	**4,868,466**	**2,635,225**	**2,724,655**	**16,237,136**

The future resource requirement details (by cost categories) is shown in Figure 52 on page 101.

4.3.2 Description of cost drivers of the future resource requirements

The resources required for vaccine supply and logistics account for 37% of the total costs for 2016-2020 (excluding shared health system costs) as shown in Figure 21 below. Service delivery is the 2nd major cost driver – accounting for 22% of the future resource requirements followed by "Program Management (20%).

Figure 21: The future total resource requirement structure by cMYP components (shared costs excluded)

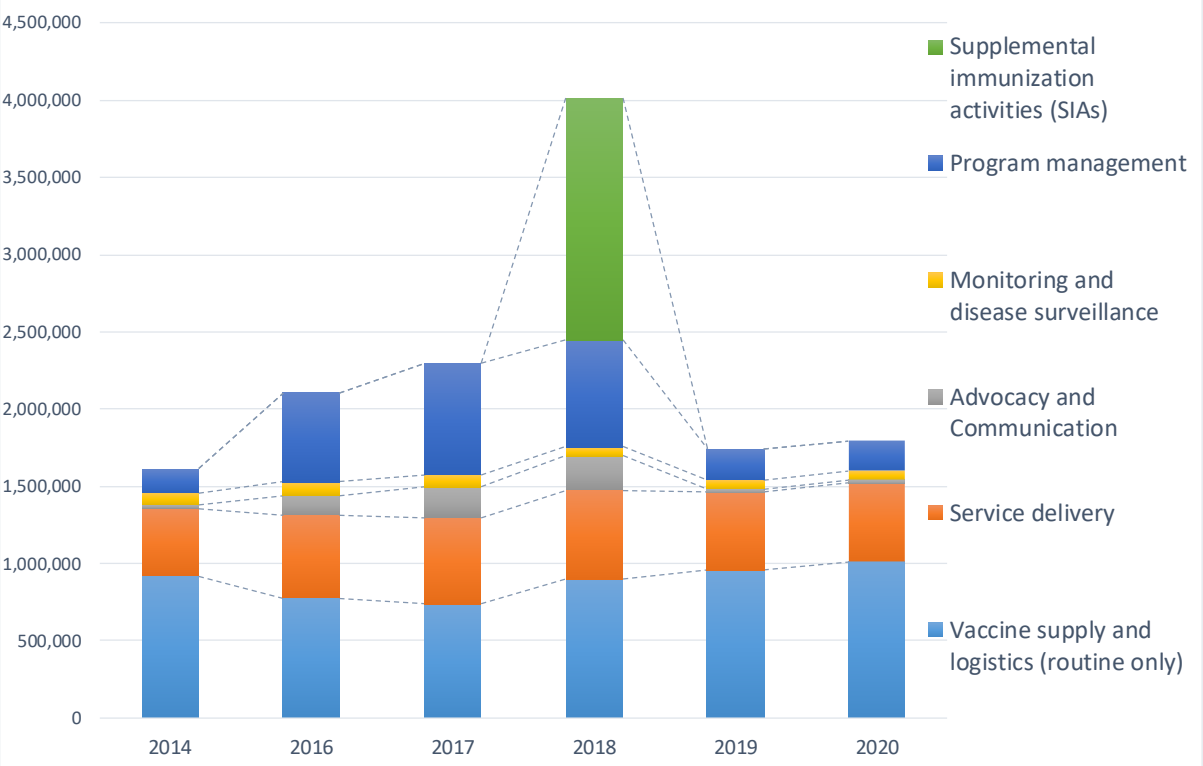


The resource requirements for routine immunization per annum varies between 1.74 and 2.29 million US$ in 2016-2020:

- The resource requirements in the first year of projection (2016) increase 495 thousand US$ (or by 31%) from 1.61 million US$ in the baseline year to 2.1 million US$. This increase is caused by higher "program management" related resource requirements offset partially by lower costs for vaccine supply and logistics as shown Figure 22 below.
- The resource requirements for routine immunization increase gradually by 7%-9% in next 2 years, decreases by 29% in 2019 compared to year 2018 The resource requirements for different cMYP components vary: it increases for vaccine supply and logistics, decrease for Advocacy and communication.

Planned to supplementary immunization activities (MR and JE campaigns) in 2018 increase the immunization resource requirements sharply by 1.56 million US$.

Figure 22: The structure of future resourece requiements by by cMYP components and years (shared costs excluded)

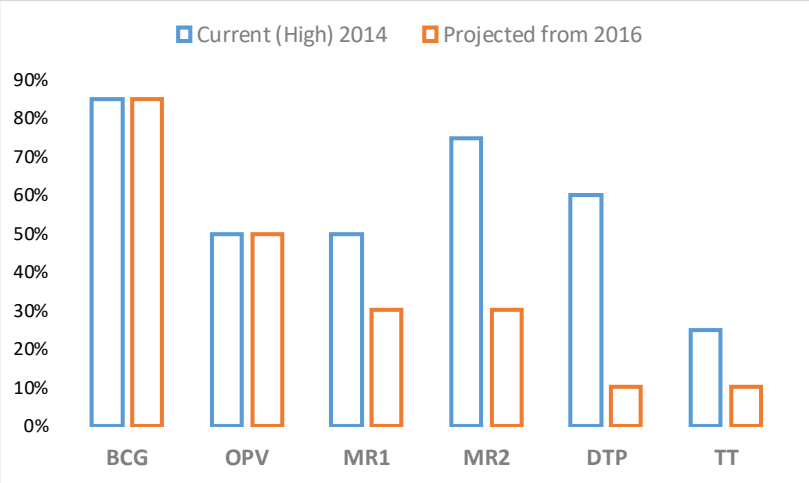


(1) Vaccines and injection supplies

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 to decrease from the current level of 50% (and >70% for BCG) to 25% (and 50% for BCG) from 2016

Figure 23: Comparison of wastage rates between the baseline and projected years for selected vaccines.



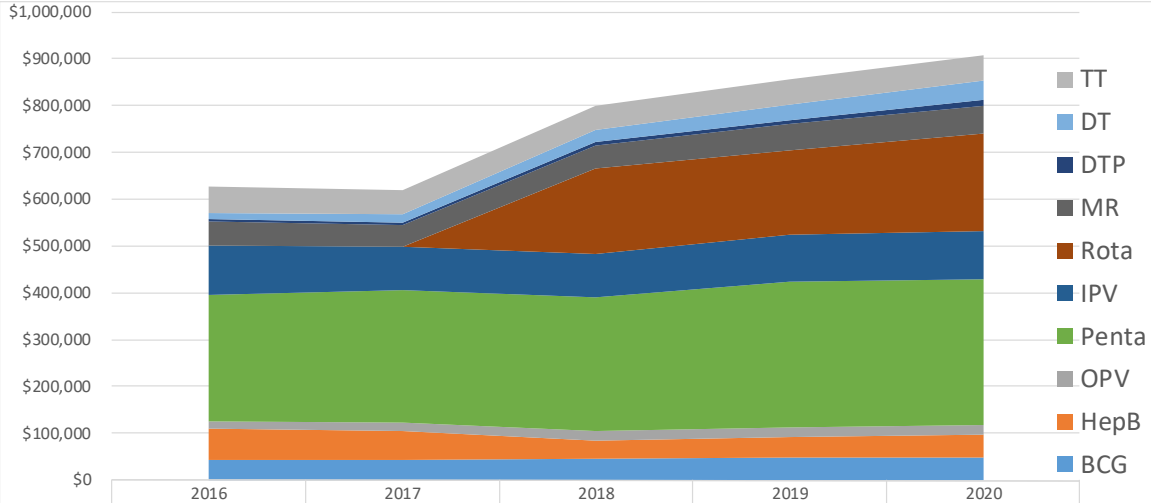
The present projections are based on vaccine price estimates provided by the EPI partners and includes 11% freight costs, 4% handling costs for vaccines and 8% handling costs for injection supplies.

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

- the cost of IPV introduced in 2015 with GAVI support and the replacement of measles vaccine with 2 doses of MR vaccine in accordance with the new vaccination calendar.
- The cost of Rota introduction in 2018
- DTP 4th dose, HepB birth doze (with 1 dose presentation from the beginning partially replaced with 10 dose per vial presentation[29])

Figure 24 below illustrates that the structure of routine immunization vaccine and injection supply costs by vaccines and years.

Figure 24: Vaccine and injection supply cost projections (routine immunization).

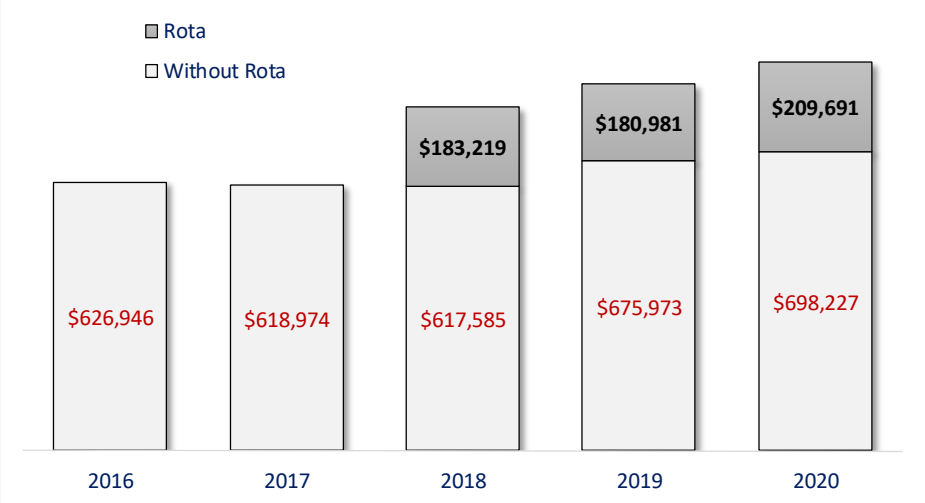


	2016	2017	2018	2019	2020
TT	$55,628	$49,908	$52,001	$54,898	$55,464
DT	$14,427	$19,236	$25,624	$32,237	$39,080
DTP	$5,108	$6,089	$7,663	$9,292	$12,852
MR	$49,749	$45,715	$50,158	$55,311	$60,003
Rota	$0	$0	$183,219	$180,981	$209,691
IPV	$107,121	$91,929	$92,840	$101,049	$101,578
Penta	$268,712	$282,823	$285,626	$310,881	$312,507
OPV	$17,046	$18,101	$18,593	$20,242	$20,697
HepB	$67,530	$61,362	$40,833	$43,908	$47,635
BCG	$41,625	$43,811	$44,247	$48,156	$48,411

The introduction of Rotavirus vaccine in 2018 increases annual resource requirement by 180-209 thousand US$ from 2018 (amounting to a total of 574 thousand US$ for the projection period) as shown in Figure 25 (on page 79).

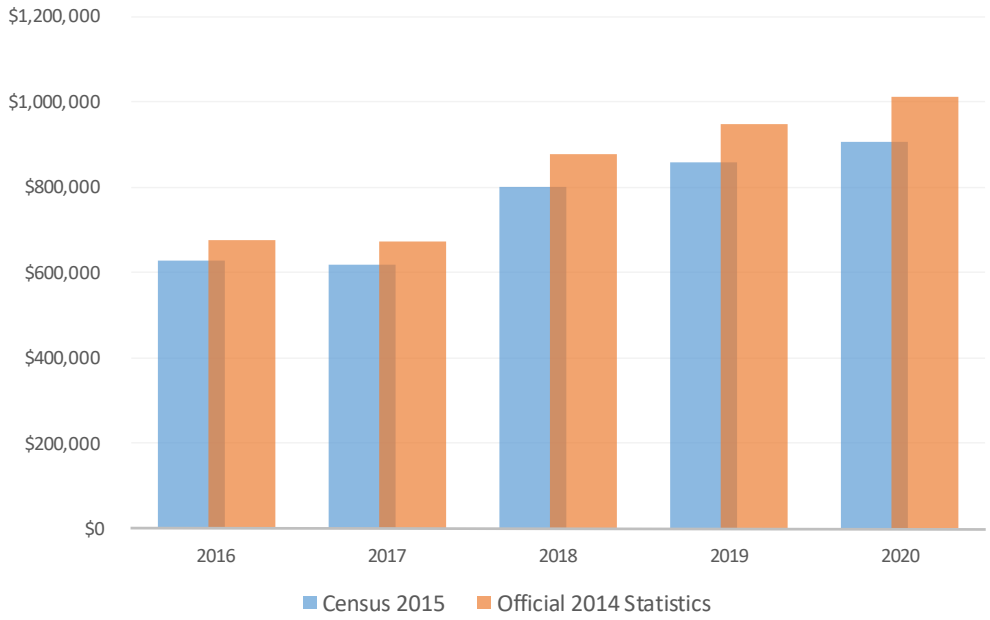
[29] Although the country plans to use 5 dose presentation of HepB vaccine, the vaccine price was available for 10 dose vial; therefore, the real cost of HepB vaccine could be higher than projected if 5 dose vial is introduced from 2010 (instead of 10 dose vial).

Figure 25: Financial implication of the introduction of Rotavirus vaccine on the NIP budget



As explained in sub-section 4.1 "Macroeconomic context and demographics", Census 2015 preliminary results were used to estimate the size of target groups and calculate vaccine requirements. Figure 24 below illustrates that the resource requirements for vaccines and injection supplies would have been higher if official 2014 demographic statistics had been used to estimate the target population size (with the population annual growth rate of 2.68% instead of 1.81% used for the projection).

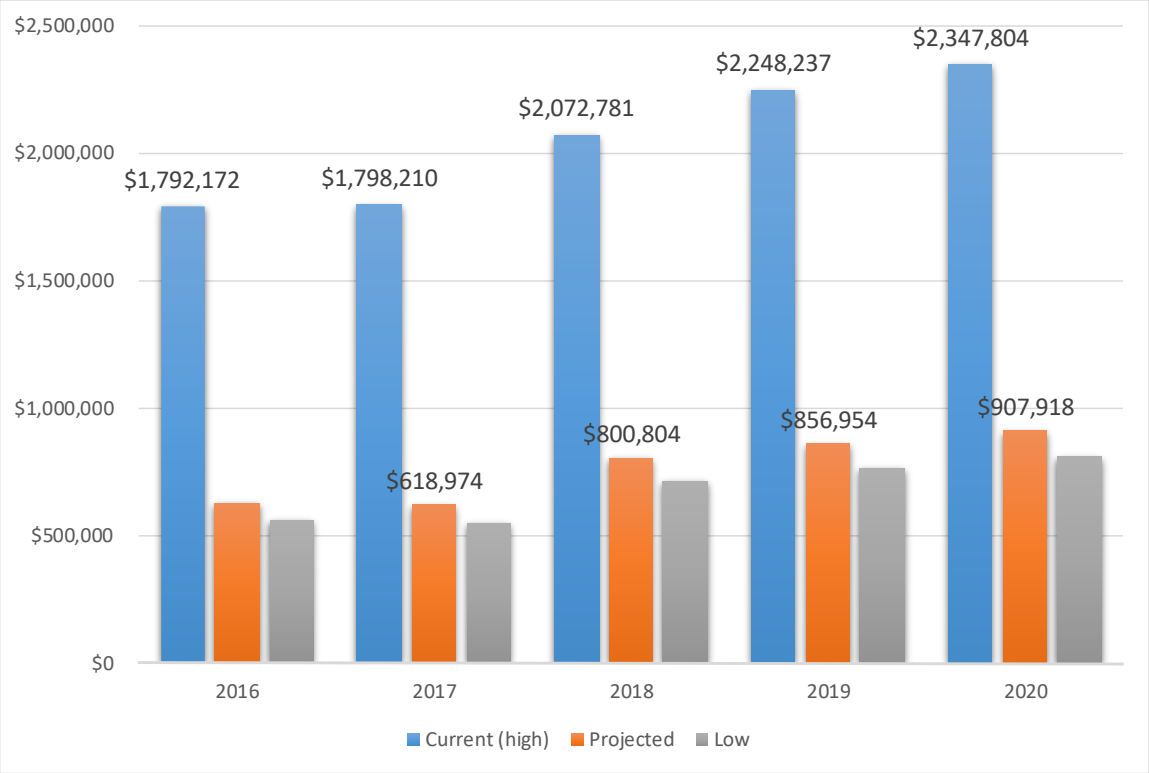
Figure 26: Comparison of routine immunizaiton vaccine and injeciton supply costs by the sources of demographic projections and years



The difference in the budgeted cost is 10% for 2016-2020 as shown in Figure 41 (on page 94).

If the baseline year vaccine wastage rates have been used for vaccine and injection supply cost calculations, then the resource requirements would have been substantially higher as shown in Figure 27 below. Further decrease in wastage rates (for example, for BCG and MR) without changing vaccine presentation results in a moderate bust still noticeable cost reduction; however, more accurate cost-effectiveness analysis would be needed to assess the feasibility of additional interventions necessary to minimize the wastage rates (to level of <5% for all vaccines and <25% for BCG).

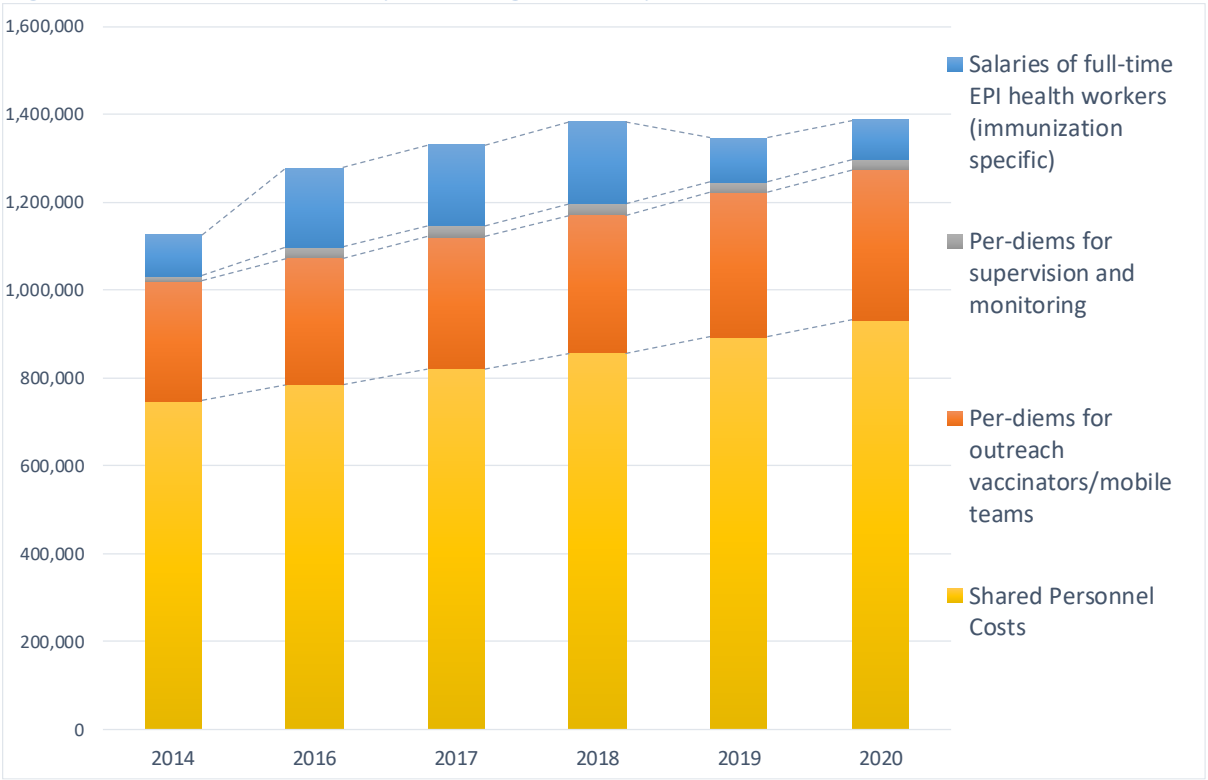
Figure 27: Comparison of vaccine and injection supply costs by the wastage rate levels



(2) Personnel

Personnel costs were estimated at 6.7 million US$ in 2016-2020, and salaries of the shared personnel (health workers of Community Health Centers and Health Posts) accounted for its 80%.

Figure 28: Personnel costs by cost categories and years (routine immunization)



The personnel costs increase gradually from the baseline year (2014) reaching a plateau in 2018: the increase is determined by opening new Health Posts at the lowest administrative levels and staffing them every year with doctors, nurses and midwifes (as shown in Figure 43 on page 94). This effect will be offset by substantial decrease in the salary of the immunization specific staff at the national level (see details in Figure 42 on page 94): 2 positions (of National Technical Officer for WHO and National Technical Officer for UNICEF) will be abolished after the end of Gavi HSS from 2019.

Per diems for outreach vaccination (60 US$ per month per team composed of a doctor, nurse and midwife) are expected to increase gradually with the recruitment of new shared personnel from 273 thousand US$ in 2016 to 342 thousand US$ in 2020 as shown in Figure 44 (on page 95).

Supervision and monitoring related per diems remain at the level of 23-25 thousand US$ per annum as shown in Figure 45 (on page 95).

(3) Cold chain equipment

No major investment in cold chain capacity was envisaged (compared to the baseline year) except: ILRs in 118 Health Posts, Electric Fridge loggers for 118 CHC and one Cold room (10,000 litter) at the national level.

Figure 29: Cold chain related resource requirements

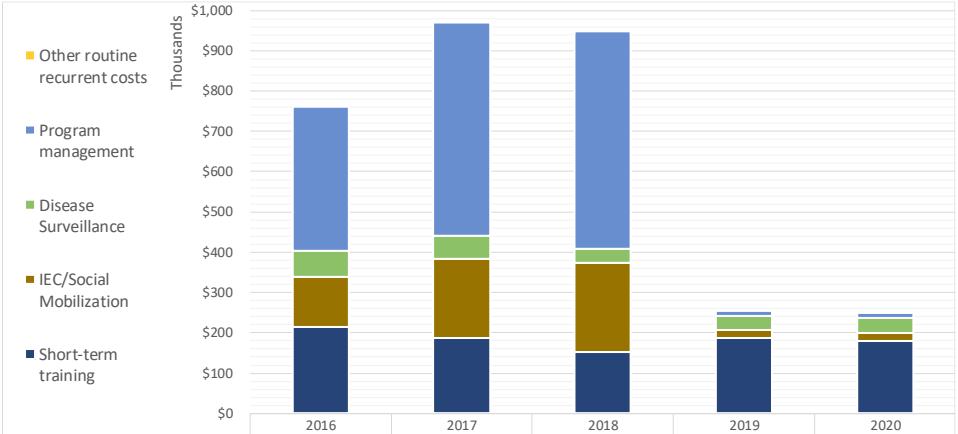
	2014	2016	2017	2018	2019	2020	Total 2016-2020
Cold chain maintenance and overhead	$66,327	$76,233	$82,896	$85,624	$88,427	$91,308	**$424,488**
Cold chain equipment	$311,403	$54,170	$32,820	$6,832	$6,969	$7,108	**$107,899**
Total	**$377,730**	**$130,403**	**$115,716**	**$92,456**	**$95,396**	**$98,416**	**$532,387**

Cold chain maintenance and overhead costs will be the major cost driver accounting for 79% of the 532 thousand US$ estimated to cover the cold chain related needs as shown in Figure 29 above.

(4) Activities and other recurrent costs

If cold chain maintenance and overhead costs are excluded (described above), then the activities and other recurrent costs amount to 3.2 million US$ in 2016-2020.

Figure 30: The future resourc requirements for "Activities and other recurrent costs"



	2016	2017	2018	2019	2020
Other routine recurrent costs	$3,570	$1,561	$0	$0	$0
Program management	$359,297	$529,310	$539,032	$12,158	$12,401
Disease Surveillance	$64,547	$58,129	$35,795	$36,510	$37,241
IEC/Social Mobilization	$123,624	$196,428	$220,758	$18,618	$18,990
Short-term training	$214,960	$187,059	$152,018	$187,531	$180,153

Out of the total 3.2 million, 40%% or US$ 1.54 US$ will be required to cover "Program Management" costs. (see Figure 30 above). The implementation of the macro-planning tool absorbs the majority of resources.

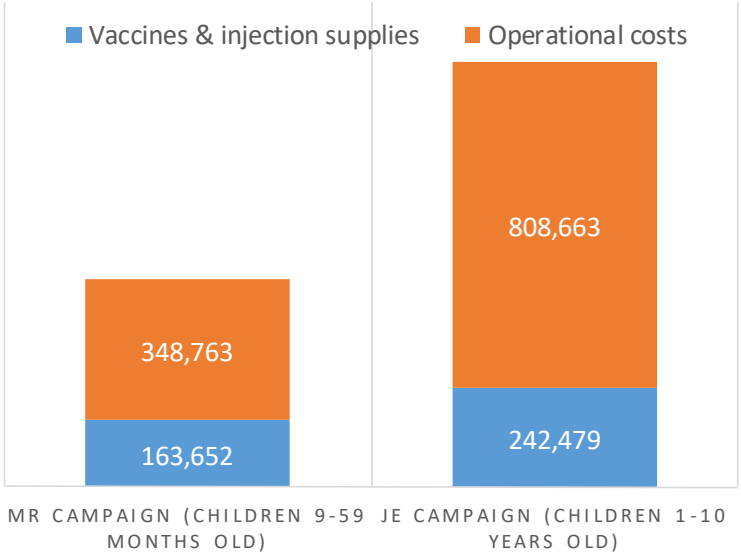
In addition to the resource requirements for Program management described above, WHO and UNICEF provide technical support to the Government spending 1.4 million US$ and 0.9 million US$ respectively in 2016-2017.

The program management activities currently supported through Gavi HSS project are expected to end in 2019 (see the list of activities and budget in Figure 53 on page 103).

(5) Supplementary immunization activities

The cost of two campaigns in 2018 was estimated at 1.56 million US$ and its structure is shown in Figure 31 below:

Figure 31: The future resource requirements for SIAs



Operational costs of the campaigns were calculated based on historical unit costs: per diem rates at 0.16 US$ per capita and "other operational costs" at 2.04 US$ per capita.

4.4 Future financing and funding gaps

The total financing for 2016-2020 was estimated at 16.2 million US$ (including shared health system costs) or at 11.9 million US$ (excluding shared health system costs).

The government is the major source of financing: 13.3 million US$ is expected to be spent by the government (if shared health system costs are included) that constitutes 75% of all funding, or 9 million US$ (if shared health system costs are excluded), that is 75% of the total funding (as shown in Figure 32 below). Government financing details for the projection period are presented in Figure 55 on page 108).

Gavi is the second major source of financing, contributing 22% of the total funding (without shared health system costs) or 16% (excluding shared health system costs).

UNICEF financing was projected as secured for 2016, and WHO financing – for 2016 and 2017. Financing from these sources for the remaining years was considered "probable".

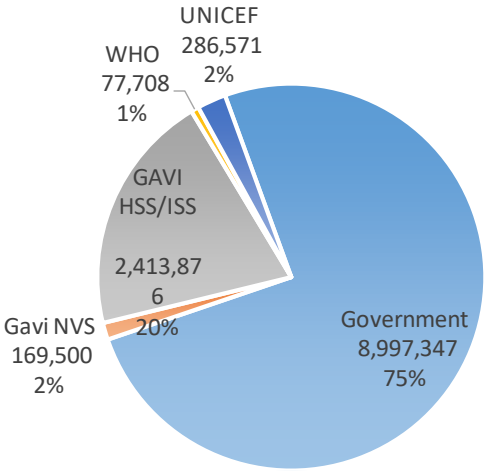
Immunization financing from UNICEF, WHO and Gavi (HSS) by cost categories are presented in detail in Figure 56 (on page 109), Figure 57 (on page 111) and Figure 58 (on page 112) respectively.

Only 26% (or 2.97 million US) of funding is considered to be secured out of the total immunization specific financing 9 million US$ (as shown in Figure 46 on page 96).

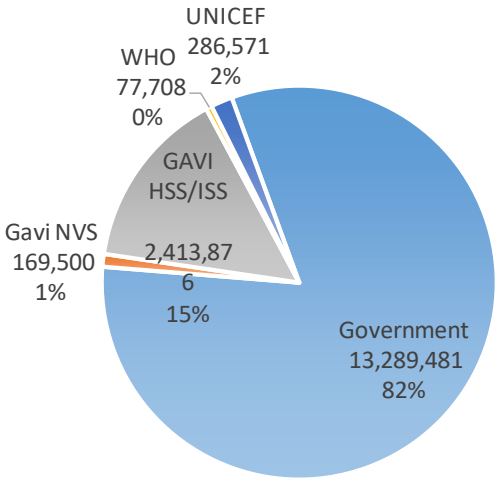
When only secured funding is considered (excluding shared health system costs), the share of government financing is 18.8% (0.6 million US$ out of total 3.3 million US secured funds); however, 97% of probable funding (or 8.6 million US$) is expected to come from the state budget. All government funding in 2017-2020 was considered as probable, and more than half in 2016 – as secured.

Figure 32: The future financing (with secured and probable funds) structure

Excluding shared health system costs

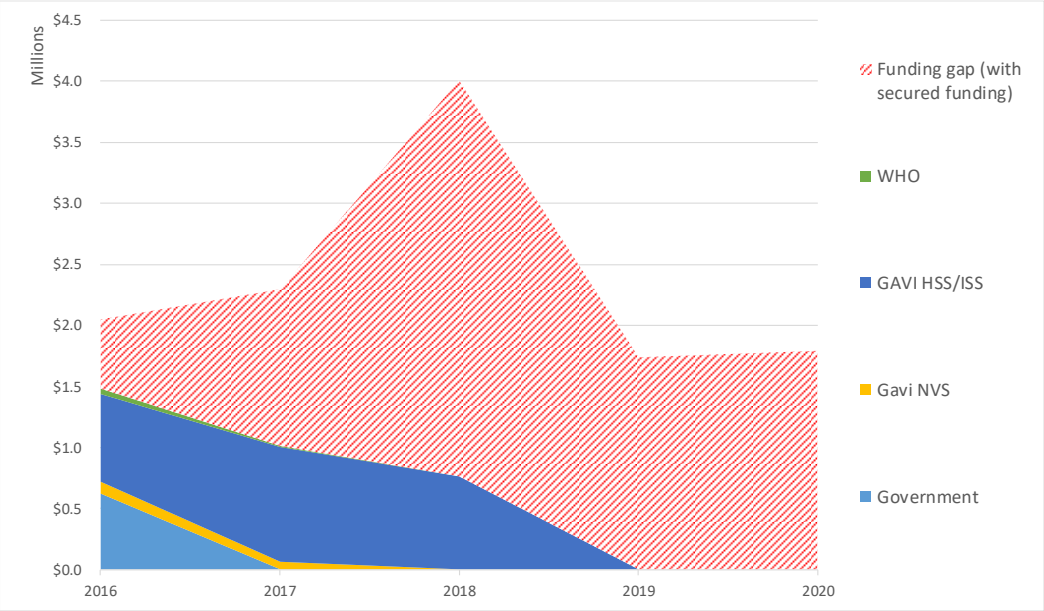


Including shared health system costs



There is no funding gap when both secured and probable funding is considered. However, the secured funding is sufficient to cover only 28% of the total resource requirements in 2016-2020, so the funding gap with secured financing ranges from 27% in 2016 to 100% in 2020 and amounts to 8.6 million US$ as shown in Figure 33 on page 84.

Figure 33: Financing by sources and funding gap by years (with secured funds only)



4.5 Funding gap analysis and sustainability

The funding gap (with secured funds only) in the amount of 8.63 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 34: Funding gap (with secured funds only) structure by years

	2016	2017	2018	2019	2020	Total
Vaccines & injection supplies	0	549,974	800,804	856,954	907,918	**3,115,650**
Personnel	299,268	334,418	527,667	453,141	454,917	**2,069,410**
Transport	72,001	73,441	74,910	76,408	77,936	**374,698**
Activities and other recurrent costs	159,056	317,162	278,818	347,477	344,410	**1,446,923**
Logistics (vehicles, cold chain and other equipment)	40,340	10,000	0	6,969	7,108	**64,417**
Supplemental immunization activities	0	0	1,563,557	0	0	**1,563,557**
Total funding gap	**570,665**	**1,284,995**	**3,245,756**	**1,740,949**	**1,792,289**	**8,634,654**

Figure 34above shows that vaccines & injection supplies account for 36% of the funding gap (3.1 million US$), followed by personnel (2.07 million US$) and “activities and other recurrent costs” (1.4 million US$).

Figure 35: Funding gap (with secured funds only) structure by the major cost categories

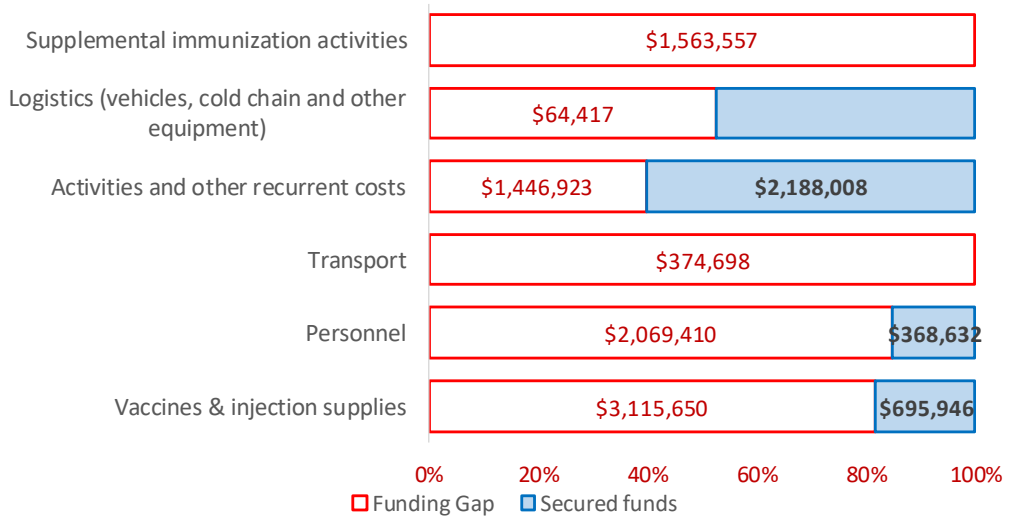


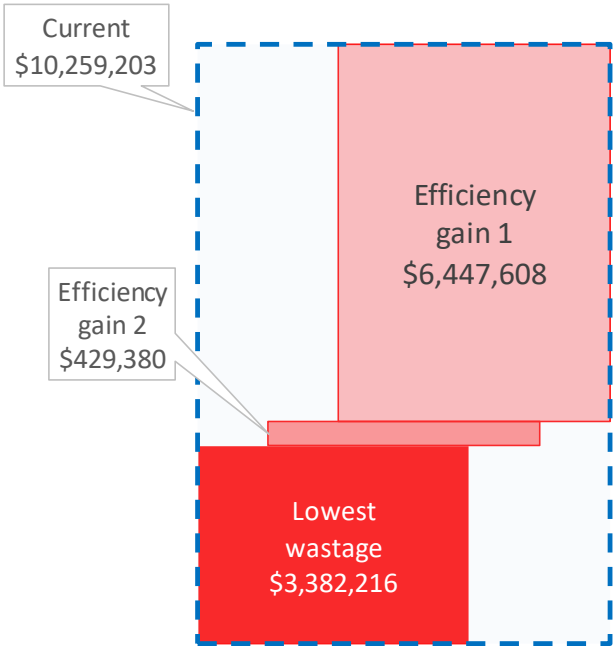
Figure 35 above shows that funding is not secured for supplemental immunization and logistics (i.e. 100% funding gap with only secured funds), while 82% of the future resource requirements for vaccines and injection supplies are not met.

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

- The end of external financing – Timor-Leste graduates from Gavi support in 2018. This explains vaccine and injection supply related gap, as well as the funding gap related to "activities and other recurrent costs".
- The lack of earmarked budget line for immunization in the state budget, that demonstrates the government's commitment to the implementation of the health sector development strategy and secures sufficient financing from domestic sources (considered as 'probable funds' for financial projections)
- Introduction of relatively expensive vaccines (MR, HepB, Rota) and expected shift of the financial burden from Gavi to the country for financing Pentavalent and IPV.

The funding gap originated despite substantial efficiency gains planned due to the decrease in the wastage rates: the future resource requirements will be reduced by 6.4 million US$ if the projected vaccine wastage rate targets are not exceeded as shown in Figure 36 below. It shows that no room is left for additional efficiency gains if the vaccine wastage rates will be further decreased below 5% for all vaccines (and below 25% for BCG).

Figure 36: Efficiency gains related to the vaccine wastage rate reduction



Therefore, the main strategy to ensure financial sustainability will be directed toward increasing the reliability of financing from domestic sources. The EPI partners plan to support the Ministry of Health to develop a detailed plan for the graduation from Gavi financial support and to implement it before 2019 to secure necessary funding for the immunization program.

Immunization program sustainability indicators are presented in Figure 54 (on page 107).

5 Annexes

Figure 37: GVAP Checklist

GVAP Strategies	Key Activities	Activity included in cMYP			
		Yes	No	Not applicable	New activity
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.	✓			

GVAP Strategies	Key Activities	Activity included in cMYP			
		Yes	No	Not applicable	New activity
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.	✓			
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 programmes (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 programmes, 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.	✓			

GVAP Strategies	Key Activities	Activity included in cMYP			
		Yes	No	Not applicable	New activity
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 programmes focusing on eradication and elimination goals are incorporated into national immunization programmes.	✓			
	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 programmes across the life course.			✓	
Strengthen monitoring and surveillance systems.	Improve the quality of all immunization administrative data and promote its analysis and use at all administrative levels to improve programme performances.	✓			
	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 programmes 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 programmes 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.	✓			

GVAP Strategies	Key Activities	Activity included in cMYP			
		Yes	No	Not applicable	New activity
	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 programmes.	✓			
	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.			✓	
	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,	Promote greater access to technology, know-how and intellectual property for adjuvants and their formulation into vaccines.			✓	

GVAP Strategies	Key Activities	Activity included in cMYP			
		Yes	No	Not applicable	New activity
licensing and uptake of vaccines.	Develop non-syringe delivery mechanisms and vaccine packaging that best suit the needs and constraints of countries' programmes.			✓	
	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.			✓	

Figure 38: Immunization personnel by levels and type (dedicated and shared)

	Number of positions filled	% Time working for Immunization	Full time equivalent (FTE) Dedicated	Shared	Total
National					
National Director, Community Health Services Department	1	10%	-	0	0
Head of Department, Maternal & Child Health Department	1	15%	-	0	0
Head, National Immunization Unit	1	100%	1	-	1
National Immunization Officer	1	100%	1	-	1
Administrative Assistant	1	100%	1	-	1
Head of Pharmacy Department	1	2%	-	0	0
Management Health Information System Officer	1	5%	-	0	0
Disease Surveillance Officer	1	10%	-	0	0
Immunization point focal point at SAMES	1	100%	1	-	1
Head, Health Promotion Department	1	10%	-	0	0
Cold Chain Technician, Drug Supply Management Unit	1	100%	1	-	1
National Technical Officer for WHO (GAVI HSS)	1	100%	1	-	1
National Technical Officer for UNICEF (GAVI HSS)	1	100%	1	-	1
National Cold Chain Manager	1	100%	1	-	1
Subtotal National	**14**	**61%**	**8**	**1**	**9**
Municipality/District					
Director of District Health Services	13	5%	-	1	1
District Public Health Officer (DPHO) Maternal & Child Health Program	13	25%	-	3	3
Management Health Information System Officer	13	10%	-	1	1
Municipality EPI Support Officer (GAVI HSS)	-	100%	-	-	-
Subtotal Municipality/District	**39**	**13%**	**-**	**5**	**5**
Postos/Sub-District					
Head of Community Health Center	69	10%	-	7	7
Nurse	138	10%	-	14	14
Midwife	138	10%	-	14	14
Doctor	138	10%	-	14	14
Subtotal Postos/Sub-District	**483**	**10%**	**-**	**48**	**48**
Sucos/Villages					
Doctor	241	10%	-	24	24
Nurse	241	10%	-	24	24
Midwife	241	10%	-	24	24
Subtotal Sucos/Villages	**723**	**10%**	**-**	**72**	**72**
Grand Total	**1,259**		**8**	**126**	**134**
			6%	94%	100%

Figure 39: Availability of cold chain equipment by levels and total cost (procured in 2010, cMYP)

Row Labels	National	Sub-District	Villages	Total	Unit Cost	Total Cost
Cold box, RCW 25/CF, PIS E4/05-M	10	20		30	$595.0	**$17,850**
Cold Rooms - Hurree H30 Capacity 10,000 Ltr	2			2	$28,000.0	**$56,000**
Freezer Room - Geoplest PRV 75 Capacity 8,000 Ltr	1			1	$26,000.0	**$26,000**
Gas cylinder - 13 kg		25		25	$70.0	**$1,750**
Gas cylinder - 45 kg		25		25	$215.0	**$5,375**
Ice-lined refrigerator - Vestfrost MK 144		3		3	$386.0	**$1,158**
Ice-lined refrigerator - Vestfrost MK 304		2		2	$532.0	**$1,064**
Ice-pack freezer - LG GF-201GRK		1		1	$1,172.0	**$1,172**
Ice-pack freezer - Vestfrost MF 214		2		2	$321.0	**$642**

Row Labels	National	Sub-District	Villages	Total	Unit Cost	Total Cost
Ice-pack freezer - Vestfrost MF 314		1		1	$367.0	**$367**
Refrigerator & freezer - Electrolux RGE-400		2		2	$1,172.0	**$2,344**
Refrigerator & freezer - Kyocera VaccPack XL 2100		4		4	$2,985.0	**$11,940**
Refrigerator & freezer - Sibir V110 GE		28		28	$711.0	**$19,908**
Refrigerator & freezer - Sibir V170 EK		1		1	$1,106.0	**$1,106**
Refrigerator & freezer - Sibir V170 GE		44		44	$833.0	**$36,652**
Vaccine Carriers	100	996		1,096	$10.4	**$11,442**
Ice packs	200	1,000		1,200	$0.4	**$458**
Grand Total	**313**	**2,154**		**2,467**		**$195,228**

Figure 40: quantities by levels and costs of the cold chain equipment planned to be procured in 2011-2015 (cMYP)

Row Labels	National	Sub-District	Villages	Total	Unit Cost	Total Cost
Cold box, RCW 25/CF, PIS E4/05-M	10	40	15	65	$595.0	**$38,675**
Cold Rooms - Hurree H30 Capacity 10,000 Ltr	2			2	$28,000.0	**$56,000**
Freezer Room - Geoplest PRV 75 Capacity 8,000 Ltr	1			1	$26,000.0	**$26,000**
Gas cylinder - 13 kg		25	30	55	$70.0	**$3,850**
Gas cylinder - 45 kg		25	90	115	$215.0	**$24,725**
Ice-lined refrigerator - Vestfrost MK 144		7		7	$386.0	**$2,702**
Ice-lined refrigerator - Vestfrost MK 304	0	2		2	$532.0	**$1,064**
Ice-pack freezer - LG GF-201GRK		1		1	$1,172.0	**$1,172**
Ice-pack freezer - Vestfrost MF 214	0	5		5	$321.0	**$1,605**
Ice-pack freezer - Vestfrost MF 314		1		1	$367.0	**$367**
Refrigerator & freezer - Electrolux RGE-400		2		2	$1,172.0	**$2,344**
Refrigerator & freezer - Kyocera VaccPack XL 2100		4	4	8	$2,985.0	**$23,880**
Refrigerator & freezer - Sibir V110 GE	0	47	13	60	$711.0	**$42,660**
Refrigerator & freezer - Sibir V170 EK		1		1	$1,106.0	**$1,106**
Refrigerator & freezer - Sibir V170 GE	0	84		84	$833.0	**$69,972**
Vaccine Carriers	100	1992		2092	$10.4	**$21,840**
Ice packs	200	2000		2200	$0.4	**$840**
Grand Total	313	4236	152	4701		**$318,802**

Figure 41: Difference in the vaccine and injection supply resource requirements projections based on Census 2015 and official statistics (2014)

	2016	2017	2018	2019	2020	Total 2016 - 2020
Census 2015	$626,946	$618,974	$800,804	$856,954	$907,918	$3,811,596
Official 2014 Statistics	$675,124	$672,678	$877,264	$947,174	$1,012,137	$4,184,378
Difference	**$48,178**	**$53,705**	**$76,460**	**$90,220**	**$104,219**	**$372,782**
	8%	9%	10%	11%	11%	10%

Figure 42: Salaries of EPI specific personnel by administrative levels, positions and years

	2014	2016	2017	2018	2019	2020	Total 2016 - 2020
National	**$92,832**	**$94,689**	**$96,582**	**$98,514**	**$22,549**	**$23,000**	**$335,335**
Head, National Immunization Unit	$3,600	$3,672	$3,745	$3,820	$3,897	$3,975	$19,109
National Immunization Officer	$2,640	$2,693	$2,747	$2,802	$2,858	$2,915	$14,013
Administrative Assistant	$1,992	$2,032	$2,072	$2,114	$2,156	$2,199	$10,574
Immunization point focal point at SAMES	$3,600	$3,672	$3,745	$3,820	$3,897	$3,975	$19,109
Cold Chain Technician, Drug Supply Management Unit	$3,000	$3,060	$3,121	$3,184	$3,247	$3,312	$15,924
National Technical Officer for WHO (GAVI HSS)	$36,000	$36,720	$37,454	$38,203	$0	$0	$112,378
National Technical Officer for UNICEF (GAVI HSS)	$36,000	$36,720	$37,454	$38,203	$0	$0	$112,378
National Cold Chain Manager	$6,000	$6,120	$6,242	$6,367	$6,495	$6,624	$31,849
Municipality/District	**$0**	**$85,680**	**$87,394**	**$89,141**	**$77,935**	**$66,245**	**$406,395**
Municipality EPI Support Officer (GAVI HSS)	$0	$85,680	$87,394	$89,141	$77,935	$66,245	$406,395
Total	**$92,832**	**$180,369**	**$183,976**	**$187,656**	**$100,484**	**$89,245**	**$741,730**

Figure 43: Salaries of shared personnel by administrative levels, positions and years

	2014	2016	2017	2018	2019	2020	Total 2016 - 2020
National	**$2,685**	**$2,739**	**$2,793**	**$2,849**	**$2,906**	**$2,964**	**$14,252**
National Director, Community Health Services Department	$768	$783	$799	$815	$831	$848	$4,077
Head of Department, Maternal & Child Health Department	$765	$780	$796	$812	$828	$845	$4,061
Head of Pharmacy Department	$102	$104	$106	$108	$110	$113	$541
Management Health Information System Officer	$180	$184	$187	$191	$195	$199	$955
Disease Surveillance Officer	$360	$367	$375	$382	$390	$397	$1,911
Head, Health Promotion Department	$510	$520	$531	$541	$552	$563	$2,707
Municipality/District	**$17,316**	**$40,062**	**$40,863**	**$41,680**	**$42,514**	**$43,364**	**$208,482**
Director of District Health Services	$4,056	$4,137	$4,220	$4,304	$4,390	$4,478	$21,530
District Public Health Officer (DPHO) Maternal & Child Health Progr	$8,580	$8,752	$8,927	$9,105	$9,287	$9,473	$45,544
Management Health Information System Officer	$4,680	$4,774	$4,869	$4,966	$5,066	$5,167	$24,842
Doctor	$0	$8,960	$9,139	$9,322	$9,508	$9,698	$46,627
Nurse	$0	$5,949	$6,068	$6,189	$6,313	$6,439	$30,957
Midwife	$0	$7,491	$7,641	$7,794	$7,949	$8,108	$38,983
Postos/Sub-District	**$287,730**	**$293,485**	**$299,354**	**$305,341**	**$311,448**	**$317,677**	**$1,527,306**
Head of Community Health Center	$35,190	$35,894	$36,612	$37,344	$38,091	$38,853	$186,793
Nurse	$67,068	$68,409	$69,778	$71,173	$72,597	$74,048	$356,005
Midwife	$84,456	$86,145	$87,868	$89,625	$91,418	$93,246	$448,303
Doctor	$101,016	$103,036	$105,097	$107,199	$109,343	$111,530	$536,205
Sucos/Villages	**$441,030**	**$449,851**	**$477,887**	**$506,865**	**$536,811**	**$567,751**	**$2,539,164**
Doctor	$176,412	$179,940	$191,155	$202,746	$214,724	$227,101	$1,015,666
Nurse	$117,126	$119,469	$126,914	$134,610	$142,563	$150,780	$674,335
Midwife	$147,492	$150,442	$159,818	$169,509	$179,524	$189,871	$849,163
Total	**$748,761**	**$786,135**	**$820,897**	**$856,736**	**$893,679**	**$931,757**	**$4,289,204**

Figure 44: Outreach per diem costs by administrative levels, positions and years

	2014	2016	2017	2018	2019	2020	Total 2016 - 2020
Municipality/District	**$0**	**$8,813**	**$8,989**	**$9,169**	**$9,352**	**$9,539**	**$45,862**
Doctor	$0	$2,938	$2,996	$3,056	$3,117	$3,180	$15,287
Nurse	$0	$2,938	$2,996	$3,056	$3,117	$3,180	$15,287
Midwife	$0	$2,938	$2,996	$3,056	$3,117	$3,180	$15,287
Postos/Sub-District	**$99,360**	**$101,347**	**$103,374**	**$105,442**	**$107,550**	**$109,701**	**$527,415**
Nurse	$33,120	$33,782	$34,458	$35,147	$35,850	$36,567	$175,805
Midwife	$33,120	$33,782	$34,458	$35,147	$35,850	$36,567	$175,805
Doctor	$33,120	$33,782	$34,458	$35,147	$35,850	$36,567	$175,805
Sucos/Villages	**$173,520**	**$176,990**	**$188,021**	**$199,422**	**$211,204**	**$223,378**	**$999,015**
Doctor	$57,840	$58,997	$62,674	$66,474	$70,401	$74,459	$333,005
Nurse	$57,840	$58,997	$62,674	$66,474	$70,401	$74,459	$333,005
Midwife	$57,840	$58,997	$62,674	$66,474	$70,401	$74,459	$333,005
Total	**$272,880**	**$287,150**	**$300,384**	**$314,033**	**$328,107**	**$342,618**	**$1,572,293**

Figure 45: Supervision per diem costs by administrative levels, positions and years

	2014	2016	2017	2018	2019	2020	Total 2016 - 2020
National	**$4,860**	**$4,957**	**$5,056**	**$5,157**	**$5,261**	**$5,366**	**$25,797**
Head, National Immunization Unit	$1,800	$1,836	$1,873	$1,910	$1,948	$1,987	$9,555
National Immunization Officer	$1,800	$1,836	$1,873	$1,910	$1,948	$1,987	$9,555
Head, Health Promotion Department	$360	$367	$375	$382	$390	$397	$1,911
Cold Chain Technician, Drug Supply Management Unit	$900	$918	$936	$955	$974	$994	$4,777
Municipality/District	**$7,020**	**$20,012**	**$20,413**	**$20,821**	**$19,289**	**$17,687**	**$98,222**
Director of District Health Services	$2,340	$2,387	$2,435	$2,483	$2,533	$2,584	$12,421
District Public Health Officer (DPHO) Maternal & Child Health Progr	$4,680	$4,774	$4,869	$4,966	$5,066	$5,167	$24,842
Municipality EPI Support Officer (GAVI HSS)	$0	$12,852	$13,109	$13,371	$11,690	$9,937	$60,959
Total	**$11,880**	**$24,970**	**$25,469**	**$25,978**	**$24,550**	**$23,053**	**$124,020**

Figure 46: Financing by sources, years and types of funds (including shared costs)

	2016	2017	2018	2019	2020	Total
Secured funding						
Government	1,408,494	821,472	857,321	894,276	932,366	**4,913,930**
Sub-national government	-	-	-	-	-	**-**
Gov. co-financing of gavi vaccine	-	-	-	-	-	**-**
Gavi NVS	100,500	69,000	-	-	-	**169,500**
GAVI HSS/ISS	714,467	934,020	765,389	-	-	**2,413,876**
WHO	41,208	6,500	-	-	-	**47,708**
UNICEF	57,469	-	-	-	-	**57,469**
Subtotal secure funding	**2,322,138**	**1,830,991**	**1,622,710**	**894,276**	**932,366**	**7,602,482**
Probable funding						
Government	537,560	1,197,535	3,187,636	1,706,822	1,745,997	**8,375,551**
Sub-national government	-	-	-	-	-	**-**
Gov. co-financing of gavi vaccine	-	-	-	-	-	**-**
Gavi NVS	-	-	-	-	-	**-**
GAVI HSS/ISS	-	-	-	-	-	**-**
WHO	-	30,000	-	-	-	**30,000**
UNICEF	33,105	57,459	58,120	34,126	46,292	**229,103**
Subtotal probable funding	**570,665**	**1,284,995**	**3,245,756**	**1,740,949**	**1,792,289**	**8,634,654**
Total (secured and probable funding)						
Government	1,946,055	2,019,007	4,044,957	2,601,099	2,678,363	**13,289,481**
Sub-national government	-	-	-	-	-	**-**
Gov. co-financing of gavi vaccine	-	-	-	-	-	**-**
Gavi NVS	100,500	69,000	-	-	-	**169,500**
GAVI HSS/ISS	714,467	934,020	765,389	-	-	**2,413,876**
WHO	41,208	36,500	-	-	-	**77,708**
UNICEF	90,574	57,459	58,120	34,126	46,292	**286,571**
Total funding	**2,892,803**	**3,115,986**	**4,868,466**	**2,635,225**	**2,724,655**	**16,237,136**

Figure 47: Financing by sources, years and types of funds (including shared costs)

	2016	2017	2018	2019	2020	Total
Secured funding						
Government	665,921	-	-	-	-	**665,921**
Sub-national government	-	-	-	-	-	**-**
Gov. co-financing of gavi vaccine	-	-	-	-	-	**-**
Gavi NVS	100,500	69,000	-	-	-	**169,500**
GAVI HSS/ISS	514,385	735,788	758,557	-	-	**2,008,730**
WHO	-	5,000	-	-	-	**5,000**
UNICEF	126,349	-	-	-	-	**126,349**
Subtotal secure funding	**1,407,155**	**809,788**	**758,557**	**-**	**-**	**2,975,500**
Probable funding						
Government	437,650	1,149,387	2,979,608	1,904,080	1,958,830	**8,429,556**
Sub-national government	-	-	-	-	-	**-**
Gov. co-financing of gavi vaccine	-	-	-	-	-	**-**
Gavi NVS	-	-	-	-	-	**-**
GAVI HSS/ISS	-	-	-	-	-	**-**
WHO	-	16,500	-	-	-	**16,500**
UNICEF	21,208	-	-	-	-	**21,208**
Subtotal probable funding	**458,858**	**1,165,887**	**2,979,608**	**1,904,080**	**1,958,830**	**8,467,264**
Total (secured and probable funding)						
Government	1,103,571	1,149,387	2,979,608	1,904,080	1,958,830	**9,095,477**
Sub-national government	-	-	-	-	-	**-**
Gov. co-financing of gavi vaccine	-	-	-	-	-	**-**
Gavi NVS	100,500	69,000	-	-	-	**169,500**
GAVI HSS/ISS	514,385	735,788	758,557	-	-	**2,008,730**
WHO	-	21,500	-	-	-	**21,500**
UNICEF	147,557	-	-	-	-	**147,557**
Total funding	**1,866,013**	**1,975,676**	**3,738,165**	**1,904,080**	**1,958,830**	**11,442,764**

Figure 48: Scores of 2011 and 2015 EVM assessments and key strength and weaknesses (categorized by level of supply chain)

Criteria	National		Municipality		CHC		Health post	
Findings by year ▶	2011	2015	2011	2015	2011	2015	2011	2015
E1 – Vaccine arrival procedures	64%	22%↓	Not applicable		Not applicable		Not applicable	
	+ VAR format							
	- documentation, PAR, agreement with customs							
E2 – Temperature monitoring	52%	35%↓	68%	55%↓	56%	50%↓	N/A[30]	22%
	+ Knowledge		+ Knowledge		+ Knowledge		+ only few HW knowledge	
	- Mapping, manual monitoring, Continuous trace, records, alarms review		- No alarms recording, manual reading, temperature review		- No alarms recording, manual reading, temperature review, old temperature monitoring sheet		-Knowledge, manual reading, temperature review	
E3 – Storage and transport capacity	83%	83%	65%	70%↑	77%	77%	N/A	72%
	+ positive and Negative storage, dry store and transport capacity		+ Sufficient dry store, transport, negative storage, positive storage, passive storage		+ Sufficient dry store, transport, positive storage		+ Sufficient positive and passive storage	
	- Contingency planning		- Contingency planning, passive containers (shortage 60% sites)		- Contingency plan, passive containers (shortage 40%of sites)		- Contingency plan	
E4 – Building, equipment and transport	95%	74%↓	87%	83%↓	94%	86%↓	N/A	72%
	+ Building standards, PQS, Vehicles		+ Access, Building, PQS equipment, 30 DTR, Thermometer, telecommunication		+ Access, building standards, PQS equipment, 30 DTR, telecommunication		+ Building, PQS passive, Transport not applicable	
	-11 Alarms and monitoring equipment, Space for packing and maintenance		-Condition of vehicles, voltage regulator		Condition of vehicles, voltage regulator, thermometer		- Telecommunications, 30 DTR, thermometer	
E5 - Maintenance	67%	69%↑	60%	53%↓	54%	43%↓	N/A	45%
	+ No breakdown		+Functional equipment		+ Functional equipment,		+ Functional equipment,	
	- Preventive maintenance		- Preventive maintenance		- Preventive maintenance		- Preventive maintenance	
E6 – Stock management	24%	46%↓	23%	38%↑	23%	32%↑	N/A	14%
	+ Msupply software, vouchers, provision for recording essential information		+ Stock book format		+ Periodic physical counting of vaccine (60% of sites)		+ none	
	- Stocks not updated, Notification, EEFO, recording wastage, internal review, stock levels, demand forecast		- Records not updated, issue vouchers, stock levels, loss damage records not systematically reviewed		- Records not updated, stock book format, issue vouchers, stock levels, loss damage records not systematically reviewed		- Records not updated, stock book format, issue vouchers, stock levels, loss damage records not systematically reviewed	
E7- Distribution	56%	24%↓	50%	32%↓	96%	32%↓	N/A	32%
	+ packing practices		+ Packing practices		+ Packing practices		+ Packing practices (vaccine carrier)	

[30] Not accessed in 2011

Criteria	National		Municipality		CHC		Health post	
Findings by year ►	2011	2015	2011	2015	2011	2015	2011	2015
	- Distribution plan, No freeze indicator, issue voucher arrival section		- No freeze indicator, distribution plan, knowledge on freeze prevention		- distribution plan, No freeze indicator, Knowledge on freeze prevention		- No freeze indicator	
E-8 Vaccine management	73%	40%↓	69%	55%↓	74%	51%↓	N/A	46%
	+ Knowledge and practices		+ VVM Knowledge and practices		+VVM Knowledge and practices		+ Knowledge on VVM, diluent use	
	- No shake test practice		- No shake test knowledge and practice, wastage calculation		- No shake test knowledge and practice, wastage calculation		- MDVP, wastage calculation	
E9 – MIS and supporting functions[31]	60%	44%↓	79%	25%↓	91%	22%↓	N/A	14%
	+ SOPs, Posts and supervision		+None		+ none		+ none	
	- Inventory, supervision records		- forecasting estimates, Inventory, Supervision, SOP		- Inventory, Supervision, forecasting estimates		+ Supervision, training	

[31] Major changes in assessment questionnaire between 2011 and 2015 EVM assessments

Figure 49: The numer of cases of selected VPD by districts and years

	Measles *				Rubella				Diphtheria				Pertussis				Tetanus neo-natal			
	2011	2012	2013	2014	2011	2012	2013	2014	2011	2012	2013	2014	2011	2012	2013	2014	2011	2012	2013	2014
Aileu	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ainaro	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bobonaro	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Baucau	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cova Lima	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dili	343	19	5	38	0	1	0	0	0	1	0	2	0	0	0	3	1	3	0	1
Ermera	264	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lautem	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Liquica	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
Manatuto	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Manufahi	38	1	0	7	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Oecusse	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Viqueque	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**739**	**20**	**5**	**47**	**0**	**1**	**0**	**1**	**0**	**1**	**0**	**2**	**0**	**0**	**0**	**3**	**4**	**3**	**1**	**1**

Source: WHO, UNICEF, CDC Atlanta. "Joint National-International Review of EPI and VPD Surveillance in Timor-Lesté 2015

Figure 50: Comparison of healthcare financing indicators by sources and years

		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
	WHO NHA indicators														
A	General government expenditure on health (GGHE) as % of THE	65.7	59.9	59.6	95.9	96.5	96.6	97.3	96.2	96.9	96.3	95.4	92.1	93.8	91.7
	Private expenditure on health (PvtHE) as % of THE	34.3	40.1	40.4	4.1	3.5	3.4	2.7	3.8	3.1	3.7	4.6	7.9	6.2	8.3
	Out of pocket expenditure as % of THE	4.0	3.8	3.8	4.1	3.5	3.4	2.7	3.7	3.0	3.6	4.6	7.8	6.2	8.2
	GGHE as % of General government expenditure	20.4	19.9	19.7	22.6	24.8	24.5	20.5	14.2	9.9	7.1	5.0	2.3	2.9	3.0
B	Total expenditure on health / capita at exchange rate	17.8	19.6	19.4	17.3	20.5	26.5	40.5	33.7	47.1	41.8	36.5	37.8	68.0	58.9
C	General government expenditure on health / cap x-rate	11.7	11.7	11.5	16.6	19.8	25.6	39.4	32.4	45.6	40.3	34.8	34.8	63.8	54.0
	WB WDI Indicators														
B	Health expenditure per capita (current US$)	19.0	19.6	19.4	24.1	27.4	33.1	46.4	40.7	54.6	50.1	45.6	46.3	49.8	
A	Health expenditure, public (% of total health expenditure)	67.9	59.9	59.6	68.9	72.2	77.3	84.9	79.6	83.6	80.4	76.3	75.3	73.8	
C	Health expenditure per capita, public (current US$)	12.9	11.7	11.6	16.6	19.8	25.6	39.4	32.4	45.6	40.3	34.8	34.9	36.8	

Sources: World Health Organization National Health Accounts (NHA) indicators, World Bank World Development Indicators (WDI)

Figure 51: Macroeconomic paramaters and projections for the cMYP costing (by sources)

	2013	2014	2016	2017	2018	2019	2020
WB WDI							
GDP	$1,319,000,000	$1,417,000,000	*$1,565,219,617*	*$1,645,045,817*	*$1,728,943,154*	*$1,817,119,255*	*$1,909,792,337*
Population	1,180,069	1,212,107	*1,277,915*	*1,312,147*	*1,347,295*	*1,383,386*	*1,420,443*
GDP per capita	1,118	1,169	*$1,225*	*$1,254*	*$1,283*	*$1,314*	*$1,345*
GDP per capita annual growth rate		4.59%	*2.36%*	*2.36%*	*2.36%*	*2.36%*	*2.36%*
WHO GHED							
GDP	$5,240,377,708	*$5,507,636,972*	*$6,083,741,306*	*$6,394,012,113*	*$6,720,106,731*	*$7,062,832,174*	*$7,423,036,615*
Population	1,132,880	*1,163,227*	*1,226,381*	*1,259,232*	*1,292,963*	*1,327,598*	*1,363,161*
GDP per capita	$4,626	*$4,735*	*$4,961*	*$5,078*	*$5,197*	*$5,320*	*$5,445*

Figure 52: National immunization program expenditures and future resource requirements (basic scenario) by cost categories

Cost category	2014	Future Resource Requirements

		2016	2017	2018	2019	2020	Total 2016-2020
Routine recurrent costs							
Vaccines (routine vaccines only)	**393,187**	**590,162**	**579,523**	**759,077**	**811,493**	**859,914**	**3,600,168**
Traditional	283,293	161,574	155,722	136,496	152,356	162,850	**768,999**
Underused	109,894	428,587	423,801	439,362	478,156	487,373	**2,257,279**
New				183,219	180,981	209,691	**573,890**
Injection supplies	20,152	36,784	39,451	41,727	45,461	48,004	**211,427**
Personnel	**377,592**	**492,489**	**509,829**	**527,667**	**453,141**	**454,917**	**2,438,042**
Salaries of full-time EPI health workers (immunization specific)	92,832	180,369	183,976	187,656	100,484	89,245	**741,730**
Per-diems for outreach vaccinators/mobile teams	272,880	287,150	300,384	314,033	328,107	342,618	**1,572,293**
Per-diems for supervision and monitoring	11,880	24,970	25,469	25,978	24,550	23,053	**124,020**
Transportation	**70,076**	**72,001**	**73,441**	**74,910**	**76,408**	**77,936**	**374,698**
Fixed Site Strategy (Incl. Vaccine Distribution)	66,739	68,573	69,944	71,343	72,770	74,225	**356,855**
Outreach strategy							
Mobile strategy	3,337	3,429	3,497	3,567	3,638	3,711	**17,843**
Maintenance and overhead	**70,237**	**80,221**	**86,964**	**89,773**	**92,659**	**95,625**	**445,243**
Cold chain maintenance and overhead	66,327	76,233	82,896	85,624	88,427	91,308	**424,488**
Maintenance of other capital equipment	3,910	3,988	4,068	4,149	4,232	4,317	**20,755**
Building Overheads (Electricity, Water…)							
Short-term training	40,000	214,960	187,059	152,018	187,531	180,153	**921,721**
IEC/Social Mobilization	27,577	123,624	196,428	220,758	18,618	18,990	**578,417**
Disease Surveillance	64,123	64,547	58,129	35,795	36,510	37,241	**232,221**
Program management	112,638	359,297	529,310	539,032	12,158	12,401	**1,452,198**
Other routine recurrent costs		3,570	1,561				**5,131**
Subtotal	1,175,581	2,037,655	2,261,694	2,440,756	1,733,980	1,785,181	**10,259,266**
Routine capital costs							
Vehicles (100% EPI)	124,000	14,280					**14,280**

Cost category		Future Resource Requirements					
	2014	2016	2017	2018	2019	2020	Total 2016-2020
Cold chain equipment	311,403	54,170	32,820	6,832	6,969	7,108	**107,899**
Other capital equipment							
Buildings Construction (100% EPI)							
Subtotal	435,403	68,450	32,820	6,832	6,969	7,108	**122,179**
Supplemental immunization activities (SIAs)							
MR Campaign (Children 9-59 months old)				512,415			**512,415**
Vaccines & injection supplies				163,652			**163,652**
Operational costs				348,763			**348,763**
JE Campaign (Children 1-10 years old)				1,051,142			**1,051,142**
Vaccines & injection supplies				242,479			**242,479**
Operational costs				808,663			**808,663**
Subtotal				**1,563,557**			**1,563,557**
Shared Health Systems Costs (EPI Portion)							
Shared Personnel Costs	748,761	786,135	820,897	856,736	893,679	931,757	**4,289,204**
Shared Transport Costs – Vehicles, Fuel and Maintenance	552	563	574	586	598	609	**2,930**
Shared buildings - construction							
Shared Buildings – Overhead							
Subtotal	749,313	786,698	821,472	857,321	894,276	932,366	**4,292,134**
Grand Total	**2,360,297**	**2,892,803**	**3,115,986**	**4,868,466**	**2,635,225**	**2,724,655**	**16,237,136**
Routine Immunization	2,360,297	2,892,803	3,115,986	3,304,909	2,635,225	2,724,655	**14,673,579**
Supplemental immunization activities (campaigns)				1,563,557			**1,563,557**

Figure 53: Description of activities by cost categories, donors and years.

Cost Category	cMYP Categories	Donor	Activities	2016	2017	2018	2019	2020	Total
IEC/social	Social Mobilization,	WHO	151C1-cMYP - Comprehensive Multi-Year Plan (cMYP)	$5,000	$5,000				**$10,000**

Cost Category	cMYP Categories	Donor	Activities	2016	2017	2018	2019	2020	Total
mobilization	Advocacy, And Communication Activities		developed and advocacy with the government officials conducted to cMYP implemented						
Short-term training	Training and Workshops	WHO	Risk assess on MNT - Support MOH to conduct risk assessment workshop on maternal and neonatal elimination status		$2,000				**$2,000**
Programme management	Program management	WHO	151C1-Ann EPI Plans - Annual EPI Plans developed and monitoring mechanisms for EPI/VPD 2017-18 established	$5,000	$3,000				**$8,000**
Other routine recurrent costs	Other activities	WHO	Develop MR Eliminating - Support MOH to develop nationally approved plan to eliminate measles and control rubella/CRS (Congenital Rubella Syndrome) by 2020	$1,500	$1,500				**$3,000**
Other routine recurrent costs	Other activities	WHO	Hep B vaccine introd - Support MOH to introduce Hepatitis B vaccine birth dose to in to the routine immunization schedule	$2,000					**$2,000**
Disease surveillance	Detection And Notification	WHO	Estblsh Sentinel Sur - Support MOH to establish sentinel surveillance system for Congenital Rubella Syndrome and maintained	$1,000	$1,000				**$2,000**
Disease surveillance	Detection and Notification	WHO	AEFI Surveillance - Support MOH National vaccine pharmacovigilance and AEFI (Adverse Events Following Immunization) monitoring systems established and functional	$1,500	$1,500				**$3,000**
Disease surveillance	Case and outbreak verification and investigation	WHO	Support for NCCPE/NC - Financial and Logistical support for quarterly meetings for and biannual felid visits for verification for Polio and Measles Eradication and Elimination Certification Committee	$1,500	$1,500				**$3,000**
Disease surveillance	Data Management	WHO	MR sero survey - Support MOH to conduct national level sero survey on measles and Rubella	$0					**$0**
Disease surveillance	Data Management	WHO	MMR Reporting - Support MOH to strengthen the monthly reporting of measles - Rubella case base	$2,000					**$2,000**
Disease surveillance	Laboratory	WHO	TA for National Lab - Strengthen national laboratory capacity to support case-based MR surveillance enhanced by providing long-term TA	$708					**$708**
Disease surveillance	Supportive activities	WHO	MMR Accreditation - support national lab to attaining accreditation for measles/rubella laboratory	$1,500	$1,500				**$3,000**
Disease surveillance	Supportive activities	WHO	HPV burden study - Support MOH to establish evidence on HPV disease burden and economic analysis	$2,000	$2,000				**$4,000**
Disease surveillance	Supportive activities	WHO	Rotavirus study - Continue to support disease burden study on rotavirus infection.	$2,500	$2,500				**$5,000**

Cost Category	cMYP Categories	Donor	Activities	2016	2017	2018	2019	2020	Total
IEC/social mobilization	Social Mobilization, Advocacy, And Communication Activities	UNICEF	Support to implement newborn and child health promotion (newborn care, care of sick newborn and children, including scaling-up birth preparedness and care during pregnancy, childbirth and post-partum, immunization uptake through mother support group as part of MoH PHC Home and Family Care Practices promotion for Nutrition	$5,000					**$5,000**
Short-term training	Training and Workshops	UNICEF	Training of 100 Health Care Providers on ENBC, 100 health care providers on CB-NBC and 100 health care providers on Managing Newborn Problems	$24,724					**$24,724**
Short-term training	Training and Workshops	UNICEF	Equipping health post and CHCs, training Staff and operational assistance to implement community-based maternal, newborn and child health care as part of MoH PHC in Ainaro and Ermera Districts	$75,000					**$75,000**
Short-term training	Training and Workshops	UNICEF	Training of 20 immunization managers and 45 service providers on mid-level management, vaccine cold chain management Standard Operating Procedures,	$21,625					**$21,625**
IEC/social mobilization	Social Mobilization, Advocacy, And Communication Activities	GAVI HSS	Conduct situation analysis and recommendations on existing community participation strategy	$0	$0	$19,225			**$19,225**
IEC/social mobilization	Social Mobilization, Advocacy, And Communication Activities	GAVI HSS	Adapt community participation model and test in two CHC Micro-Planning Districts (and scale up nationally)	$104,000	$171,600	$171,600			**$447,200**
IEC/social mobilization	Social Mobilization, Advocacy, And Communication Activities	GAVI HSS	Evaluate process and outcome after 6 months and on annual basis, and revise guidelines accordingly (5 National Staff)	$7,200	$7,200	$7,200			**$21,600**
Short-term training	Training and Workshops	GAVI HSS	MLM Training of 35 participants for 5 days every 6 months	$20,360	$20,360	$20,360			**$61,080**
Programme management	Program management	GAVI HSS	National Technical Assistance through UN	$63,000	$63,000	$63,000			**$189,000**
Programme management	Program management	GAVI HSS	Midterm and End of program Evaluations - 1 international advisers, and a team of 5 national staff working 10 days in country	$9,090	$0	$9,090			**$18,180**
Programme management	Program management	GAVI HSS	Conduct annual independent audit of GAVI HSS (team of 2 with 1 audit per year)	$12,780	$12,780	$12,780			**$38,340**

Cost Category	cMYP Categories	Donor	Activities	2016	2017	2018	2019	2020	Total
Programme management	Program management	GAVI HSS	Conduct health needs assessment and baseline M & E in 13 districts (team of 5)	$5,870	$6,904	$0			**$12,774**
Other routine recurrent costs	Other activities	GAVI HSS	Quarterly planning Meetings at District	$6,912	$11,232	$11,232			**$29,376**
Other routine recurrent costs	Other activities	GAVI HSS	Micro-planning implementation costs	$249,600	$411,840	$411,840			**$1,073,280**
Disease surveillance	Data Management	GAVI HSS	3 by 30 cluster surveys in 3 randomly selected districts in 2013	$15,501					**$15,501**
Disease surveillance	Supportive activities	GAVI HSS	Implement Central Supportive Supervision program (quarterly District visits team of 5 for 3 days)	$2,792	$2,792	$4,150			**$9,734**
Disease surveillance	Supportive activities	GAVI HSS	Implement District Supportive Supervision program (monthly visits to CHCs 5 days per month)	$17,280	$28,080	$28,080			**$73,440**
			Total	**$661,942**	**$750,288**	**$758,557**	**$0**	**$0**	**$2,170,787**

Figure 54: Macroeconomic and sustainability indicators

	2014	2016	2017	2018	2019	2020
Macroeconomic projections						
Population	1,167,242	1,188,369	1,209,879	1,231,777	1,254,073	1,276,771
GDP ($)	1,364,551,078	1,422,009,444	1,481,887,259	1,544,286,404	1,609,313,044	1,677,077,819
Per capita GDP ($)	1,169	1,197	1,225	1,254	1,283	1,314
Total Health Expenditures (THE $)	68,750,554	71,645,494	74,662,335	77,806,208	81,082,464	84,496,675
Total Health Expenditures (THE) per capita	59	60	62	63	65	66
Government Health Expenditures (GHE $)	63,044,258	65,698,918	68,465,361	71,348,293	74,352,619	77,483,451
Government Health Expenditure per capita ($)	54	55	57	58	59	61
Resource requirements for immunization						
Routine and SIAs (Campaigns)	1,499,384	2,106,105	2,294,514	4,011,145	1,740,949	1,792,289
Routine only (includes vaccines and operational costs)	1,499,384	2,106,105	2,294,514	2,447,588	1,740,949	1,792,289
Per DTP3 immunized child	50	61	63	66	44	44
Per capita						
Routine and SIAs (Campaigns)	1.28	1.77	1.90	3.26	1.39	1.40
Routine only (includes vaccines and operational costs)	1.28	1.77	1.90	1.99	1.39	1.40
% Government Health Expenditures						
Routine and SIAs (Campaigns)	2.38%	3.21%	3.35%	5.62%	2.34%	2.31%
Routine only (includes vaccines and operational costs)	2.38%	3.21%	3.35%	3.43%	2.34%	2.31%
% Of Total Health Expenditures (THE)						
Routine and SIAs (Campaigns)	2.18%	2.94%	3.07%	5.16%	2.15%	2.12%
Routine only (includes vaccines and operational costs)	2.18%	2.94%	3.07%	3.15%	2.15%	2.12%
% GDP						
Routine and SIAs (Campaigns)	0.11%	0.15%	0.15%	0.26%	0.11%	0.11%
Routine only (includes vaccines and operational costs)	0.11%	0.15%	0.15%	0.16%	0.11%	0.11%
Funding gap						
Funding gap (with secured funds only)		570,665	1,284,995	3,245,756	1,740,949	1,792,289

	2014	2016	2017	2018	2019	2020
% of the future resource requirements for immunization		27%	56%	81%	100%	100%
% Government Health Expenditures		0.87%	1.88%	4.55%	2.34%	2.31%
% Of Total Health Expenditures (THE)		0.80%	1.72%	4.17%	2.15%	2.12%
% GDP		0.04%	0.09%	0.21%	0.11%	0.11%
Funding gap (with secured & probable funds)		0	0	0	0	0
% of the future resource requirements for immunization		0%	0%	0%	0%	0%
% Government Health Expenditures		0.00%	0.00%	0.00%	0.00%	0.00%
% Of Total Health Expenditures (THE)		0.00%	0.00%	0.00%	0.00%	0.00%
% GDP		0.00%	0.00%	0.00%	0.00%	0.00%

Figure 55: Total resource requirements, funding from all sources by risk types, funding gap and government financing by cost categories (2016-2020)

Cost category	Future resource requirements Total 2016-2020	Funding from all sources			Funding Gap				Government Funding					
		Secured	Probable	Total	With secured funds only		With secured and probable		Secured	% of All secured funds	Probable	% of all probable funds	Total	% of Total funds
Routine recurrent costs														
Vaccines (routine vaccines only)	**3,600,168**	**659,162**	**2,941,007**	**3,600,168**	**2,941,007**	**82%**	**0**	**0%**	**489,662**	**74%**	**2,941,007**	**100%**	**3,430,670**	**95%**
Traditional	**768,999**	161,574	607,424	768,999	607,424	79%	0	0%	161,574	100%	607,424	100%	769,000	100%
Underused	**2,257,279**	497,587	1,759,692	2,257,279	1,759,692	78%	0	0%	328,087	66%	1,759,692	100%	2,087,780	92%
New	**573,890**	0	573,890	573,890	573,890	100%	0	0%	0		573,890	100%	573,890	100%
Injection supplies	**211,427**	36,784	174,643	211,427	174,643	83%	0	0%	36,784	100%	174,643	100%	211,428	100%
Personnel	**2,438,042**	**368,632**	**2,069,410**	**2,438,042**	**2,069,410**	**85%**	**0**	**0%**	**15,129**	**4%**	**2,044,186**	**99%**	**2,059,314**	**84%**
Salaries of full-time EPI health workers (immunization specific)	**741,730**	342,671	399,059	741,730	399,059	54%	0	0%	15,129	4%	373,834	94%	388,963	52%
Per-diems for outreach vaccinators/mobile teams	**1,572,293**	0	1,572,293	1,572,293	1,572,293	100%	0	0%	0		1,572,293	100%	1,572,293	100%
Per-diems for supervision and monitoring	**124,020**	25,961	98,059	124,020	98,059	79%	0	0%	0	0%	98,059	100%	98,059	79%
Transportation	**374,698**	**0**	**374,698**	**374,698**	**374,698**	**100%**	**0**	**0%**	**0**		**374,698**	**100%**	**374,698**	**100%**
Fixed Site Strategy (Incl. Vaccine Distribution)	**356,855**	0	356,855	356,855	356,855	100%	0	0%	0		356,855	100%	356,855	100%
Outreach strategy + Mobile strategy	**17,843**	0	17,843	17,843	17,843	100%	0	0%	0		17,843	100%	17,843	100%
Maintenance and overhead	**445,243**	**80,221**	**365,022**	**445,243**	365,022	82%	0	0%	0	0%	0	0%	0	0%
Cold chain maintenance and overhead	**424,488**	76,233	348,255	424,488	348,255	82%	0	0%	76,233	100%	348,255	100%	424,489	100%
Maintenance of other capital equipment	**20,755**	3,988	16,767	20,755	16,767	81%	0	0%	3,988	100%	16,767	100%	20,756	100%
Building Overheads (Electricity, Water…)				0					0		0		0	
Short-term training	**921,721**	107,429	814,292	921,721	814,292	88%	0	0%	0	0%	778,640	96%	778,640	84%
IEC/Social Mobilization	**578,417**	503,025	75,392	578,417	75,392	13%	0	0%	0	0%	26,392	35%	26,392	5%
Disease Surveillance	**232,221**	126,383	105,838	232,221	105,838	46%	0	0%	0	0%	80,838	76%	80,838	35%
Program management	**1,452,198**	1,365,950	86,248	1,452,198	86,248	6%	0	0%	0	0%	12,158	14%	12,158	1%
Other routine recurrent costs	**5,131**	5,000	131	5,131	131	3%	0	0%	0	0%	131	100%	131	3%

Cost category	Future resource requirements Total 2016-2020	Funding from all sources			Funding Gap				Government Funding					
		Secured	Probable	Total	With secured funds only		With secured and probable		Secured	% of All secured funds	Probable	% of all probable funds	Total	% of Total funds
Subtotal	**10,259,266**	**3,252,586**	**7,006,680**	**10,259,266**	**7,006,680**	**68%**	**0**	**0%**	**585,012**	**18%**	**6,623,071**	**95%**	**7,208,083**	**70%**
Routine capital costs														
Vehicles (100% EPI)	**14,280**	0	14,280	14,280	14,280	100%	0	0%	0		14,280	100%	14,280	100%
Cold chain equipment	**107,899**	57,762	50,137	107,899	50,137	46%	0	0%	0	0%	0	0%	0	0%
Other capital equipment				0					0		0		0	
Buildings Construction (100% EPI)				0					0		0		0	
Subtotal	**122,179**	**57,762**	**64,417**	**122,179**	**64,417**	**53%**	**0**	**0%**	**0**	**0%**	**14,280**	**22%**	**14,280**	**12%**
Supplemental immunization activities (SIAs)														
MR Campaign (Children 9-59 months old)	**512,415**	**0**	**512,415**	**512,415**	**512,415**	**100%**	**0**	**0%**	**512,415**		**18**	**0%**	**512,433**	**100%**
Vaccines & injection supplies	**163,652**	0	163,652	163,652	163,652	100%	0	0%	163,652		9	0%	163,661	100%
Operational costs	**348,763**	0	348,763	348,763	348,763	100%	0	0%	348,763		9	0%	348,772	100%
JE Campaign (Children 1-10 years old)	**1,051,142**	**0**	**1,051,142**	**1,051,142**	**1,051,142**	**100%**	**0**	**0%**	**1,051,142**		**18**	**0%**	**1,051,160**	**100%**
Vaccines & injection supplies	**242,479**	0	242,479	242,479	242,479	100%	0	0%	242,479		9	0%	242,488	100%
Operational costs	**808,663**	0	808,663	808,663	808,663	100%	0	0%	808,663		9	0%	808,672	100%
Subtotal	**1,563,557**	**0**	**1,563,557**	**1,563,557**	**1,563,557**	**100%**	**0**	**0%**	**1,563,557**		**144**	**0%**	**1,563,701**	**100%**
Shared Health Systems Costs (EPI Portion)														
Shared Personnel Costs	**4,289,204**	**4,289,204**	**0**	**4,289,204**	**0**	**0%**	**0**	**0%**	**4,289,204**	**100%**	**0**		**4,289,205**	**100%**
Shared Transport Costs – Vehicles, Fuel and Maintenance	**2,930**	2,930	0	2,930	0	0%	0	0%	2,930	100%	0		2,931	100%
Shared buildings - construction				0					0		0		0	
Shared Buildings – Overhead				0					0		0		0	
Subtotal	**4,292,134**	**4,292,134**	**0**	**4,292,134**	**0**	**0%**	**0**	**0%**	**4,292,134**	**100%**	**0**		**4,292,135**	**100%**
Grand Total	**16,237,136**	**7,602,482**	**8,634,654**	**16,237,136**	**8,634,654**	**53%**	**0**	**0%**	**6,440,703**	**85%**	**6,637,495**	**77%**	**13,078,199**	**81%**
Routine Immunization	**14,673,579**	7,602,482	7,071,097	14,673,579	7,071,097	48%	0	0%	4,877,146	64%	6,637,351	94%	11,514,498	78%
Supplemental immunization activities	**1,563,557**	0	1,563,557	1,563,557	1,563,557	100%	0	0%	1,563,557		144	0%	1,563,701	100%

Figure 56: Total resource requirements by cost categories, funding from all sources and funding from UNICEF by risk types (2016-2020)

Cost category	Future resource requirements Total 2016-2020	Funding from all sources			UNICEF					
		Secured	Probable	Total	Secured	% of All secured funds	Probable	% of all probable funds	Total	% of Total funds
Routine recurrent costs										
Vaccines (routine vaccines only)	**3,600,168**	**659,162**	**2,941,007**	**3,600,168**	**0**	**0%**	**0**	**0%**	**0**	**0%**
Traditional	**768,999**	161,574	607,424	768,999	0	0%	0	0%	0	0%
Underused	**2,257,279**	497,587	1,759,692	2,257,279	0	0%	0	0%	0	0%
New	**573,890**	0	573,890	573,890	0		0	0%	0	0%
Injection supplies	**211,427**	36,784	174,643	211,427	0	0%	0	0%	0	0%
Personnel	**2,438,042**	**368,632**	**2,069,410**	**2,438,042**	**6,120**	**2%**	**25,224**	**1%**	**31,344**	**1%**

Cost category	Future resource requirements Total 2016-2020	Funding from all sources			UNICEF					
		Secured	Probable	Total	Secured	% of All secured funds	Probable	% of all probable funds	Total	% of Total funds
Salaries of full-time EPI health workers (immunization specific)	**741,730**	342,671	399,059	741,730	6,120	2%	25,224	6%	31,344	4%
Per-diems for outreach vaccinators/mobile teams	**1,572,293**	0	1,572,293	1,572,293	0		0	0%	0	0%
Per-diems for supervision and monitoring	**124,020**	25,961	98,059	124,020	0	0%	0	0%	0	0%
Transportation	**374,698**	**0**	**374,698**	**374,698**	**0**		**0**	**0%**	**0**	**0%**
Fixed Site Strategy (Incl. Vaccine Distribution)	**356,855**	0	356,855	356,855	0		0	0%	0	0%
Outreach strategy + Mobile strategy	**17,843**	0	17,843	17,843	0		0	0%	0	0%
Maintenance and overhead	**445,243**	**80,221**	**365,022**	**445,243**	0	0%	0	0%	0	0%
Cold chain maintenance and overhead	**424,488**	76,233	348,255	424,488	0	0%	0	0%	0	0%
Maintenance of other capital equipment	**20,755**	3,988	16,767	20,755	0	0%	0	0%	0	0%
Building Overheads (Electricity, Water…)				0	0		0		0	
Short-term training	**921,721**	107,429	814,292	921,721	46,349	43%	33,652	4%	80,001	9%
IEC/Social Mobilization	**578,417**	503,025	75,392	578,417	5,000	1%	49,000	65%	54,000	9%
Disease Surveillance	**232,221**	126,383	105,838	232,221	0	0%	0	0%	0	0%
Program management	**1,452,198**	1,365,950	86,248	1,452,198	0	0%	71,090	82%	71,090	5%
Other routine recurrent costs	**5,131**	5,000	131	5,131	0	0%	0	0%	0	0%
Subtotal	**10,259,266**	**3,252,586**	**7,006,680**	**10,259,266**	**57,469**	**2%**	**178,966**	**3%**	**236,435**	**2%**
Routine capital costs										
Vehicles (100% EPI)	**14,280**	0	14,280	14,280	0		0	0%	0	0%
Cold chain equipment	**107,899**	57,762	50,137	107,899	0	0%	50,137	100%	50,137	46%
Other capital equipment				0	0		0		0	
Buildings Construction (100% EPI)				0	0		0		0	
Subtotal	**122,179**	**57,762**	**64,417**	**122,179**	**0**	**0%**	**50,137**	**78%**	**50,137**	**41%**
Supplemental immunization activities (SIAs)										
MR Campaign (Children 9-59 months old)	**512,415**	**0**	**512,415**	**512,415**	**0**		**0**	**0%**	**0**	**0%**
Vaccines & injection supplies	**163,652**	0	163,652	163,652	0		0	0%	0	0%
Operational costs	**348,763**	0	348,763	348,763	0		0	0%	0	0%
JE Campaign (Children 1-10 years old)	**1,051,142**	**0**	**1,051,142**	**1,051,142**	**0**		**0**	**0%**	**0**	**0%**
Vaccines & injection supplies	**242,479**	0	242,479	242,479	0		0	0%	0	0%
Operational costs	**808,663**	0	808,663	808,663	0		0	0%	0	0%
Subtotal	**1,563,557**	**0**	**1,563,557**	**1,563,557**	**0**		**0**	**0%**	**0**	**0%**
Shared Health Systems Costs (EPI Portion)										
Shared Personnel Costs	**4,289,204**	**4,289,204**	**0**	**4,289,204**	**0**	**0%**	**0**		**0**	**0%**
Shared Transport Costs – Vehicles, Fuel and Maintenance	**2,930**	2,930	0	2,930	0	0%	0		0	0%
Shared buildings - construction				0	0		0		0	
Shared Buildings – Overhead				0	0		0		0	
Subtotal	**4,292,134**	**4,292,134**	**0**	**4,292,134**	**0**	**0%**	**0**		**0**	**0%**
Grand Total	**16,237,136**	**7,602,482**	**8,634,654**	**16,237,136**	**57,469**	**1%**	**229,103**	**3%**	**286,571**	**2%**

Cost category	Future resource requirements Total 2016-2020	Funding from all sources			UNICEF					
		Secured	Probable	Total	Secured	% of All secured funds	Probable	% of all probable funds	Total	% of Total funds
Routine Immunization	**14,673,579**	7,602,482	7,071,097	14,673,579	57,469	1%	229,103	3%	286,571	2%
Supplemental immunization activities	**1,563,557**	0	1,563,557	1,563,557	0		0	0%	0	0%

Figure 57: Total resource requirements by cost categories, funding from all sources and funding from WHO by risk types (2016-2020)

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)	**3,600,168**	**659,162**	**2,941,007**	**3,600,168**	**0**	**0%**	**0**	**0%**	**0**	**0%**
Traditional	**768,999**	161,574	607,424	768,999	0	0%	0	0%	0	0%
Underused	**2,257,279**	497,587	1,759,692	2,257,279	0	0%	0	0%	0	0%
New	**573,890**	0	573,890	573,890	0		0	0%	0	0%
Injection supplies	**211,427**	36,784	174,643	211,427	0	0%	0	0%	0	0%
Personnel	**2,438,042**	**368,632**	**2,069,410**	**2,438,042**	**0**	**0%**	**0**	**0%**	**0**	**0%**
Salaries of full-time EPI health workers (immunization specific)	**741,730**	342,671	399,059	741,730	0	0%	0	0%	0	0%
Per-diems for outreach vaccinators/mobile teams	**1,572,293**	0	1,572,293	1,572,293	0		0	0%	0	0%
Per-diems for supervision and monitoring	**124,020**	25,961	98,059	124,020	0	0%	0	0%	0	0%
Transportation	**374,698**	**0**	**374,698**	**374,698**	**0**		**0**	**0%**	**0**	**0%**
Fixed Site Strategy (Incl. Vaccine Distribution)	**356,855**	0	356,855	356,855	0		0	0%	0	0%
Outreach strategy + Mobile strategy	**17,843**	0	17,843	17,843	0		0	0%	0	0%
Maintenance and overhead	**445,243**	**80,221**	**365,022**	**445,243**	0	0%	0	0%	0	0%
Cold chain maintenance and overhead	**424,488**	76,233	348,255	424,488	0	0%	0	0%	0	0%
Maintenance of other capital equipment	**20,755**	3,988	16,767	20,755	0	0%	0	0%	0	0%
Building Overheads (Electricity, Water…)				0	0		0		0	
Short-term training	**921,721**	107,429	814,292	921,721	0	0%	2,000	0%	2,000	0%
IEC/Social Mobilization	**578,417**	503,025	75,392	578,417	10,000	2%	0	0%	10,000	2%
Disease Surveillance	**232,221**	126,383	105,838	232,221	27,708	22%	25,000	24%	52,708	23%
Program management	**1,452,198**	1,365,950	86,248	1,452,198	5,000	0%	3,000	3%	8,000	1%
Other routine recurrent costs	**5,131**	5,000	131	5,131	5,000	100%	0	0%	5,001	97%
Subtotal	**10,259,266**	**3,252,586**	**7,006,680**	**10,259,266**	**47,708**	**1%**	**30,000**	**0%**	**77,708**	**1%**
Routine capital costs										
Vehicles (100% EPI)	**14,280**	0	14,280	14,280	0		0	0%	0	0%
Cold chain equipment	**107,899**	57,762	50,137	107,899	0	0%	0	0%	0	0%
Other capital equipment				0	0		0		0	
Buildings Construction (100% EPI)				0	0		0		0	
Subtotal	**122,179**	**57,762**	**64,417**	**122,179**	**0**	**0%**	**0**	**0%**	**0**	**0%**

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
Supplemental immunization activities (SIAs)										
MR Campaign (Children 9-59 months old)	**512,415**	**0**	**512,415**	**512,415**	**0**		**0**	**0%**	**0**	**0%**
Vaccines & injection supplies	**163,652**	0	163,652	163,652	0		0	0%	0	0%
Operational costs	**348,763**	0	348,763	348,763	0		0	0%	0	0%
JE Campaign (Children 1-10 years old)	**1,051,142**	**0**	**1,051,142**	**1,051,142**	**0**		**0**	**0%**	**0**	**0%**
Vaccines & injection supplies	**242,479**	0	242,479	242,479	0		0	0%	0	0%
Operational costs	**808,663**	0	808,663	808,663	0		0	0%	0	0%
Subtotal	**1,563,557**	**0**	**1,563,557**	**1,563,557**	**0**		**0**	**0%**	**0**	**0%**
Shared Health Systems Costs (EPI Portion)										
Shared Personnel Costs	**4,289,204**	**4,289,204**	**0**	**4,289,204**	**0**	**0%**	**0**		**0**	**0%**
Shared Transport Costs – Vehicles, Fuel and Maintenance	**2,930**	2,930	0	2,930	0	0%	0		0	0%
Shared buildings - construction				0	0		0		0	
Shared Buildings – Overhead				0	0		0		0	
Subtotal	**4,292,134**	**4,292,134**	**0**	**4,292,134**	**0**	**0%**	**0**		**0**	**0%**
Grand Total	**16,237,136**	**7,602,482**	**8,634,654**	**16,237,136**	**47,708**	**1%**	**30,000**	**0%**	**77,708**	**0%**
Routine Immunization	**14,673,579**	7,602,482	7,071,097	14,673,579	47,708	1%	30,000	0%	77,708	1%
Supplemental immunization activities	**1,563,557**	0	1,563,557	1,563,557	0		0	0%	0	0%

Figure 58: Total resource requirements by cost categories, funding from all sources and funding from Gavi (HSS) by risk types (2016-2020)

Cost category	Future resource requirements Total 2016-2020	Funding from all sources			GAVI HSS/ISS					
		Secured	Probable	Total	Secured	% of All secured funds	Probable	% of all probable funds	Total	% of Total funds
Routine recurrent costs										
Vaccines (routine vaccines only)	**3,600,168**	**659,162**	**2,941,007**	**3,600,168**	**0**	**0%**	**0**	**0%**	**0**	**0%**
Traditional	**768,999**	161,574	607,424	768,999	0	0%	0	0%	0	0%
Underused	**2,257,279**	497,587	1,759,692	2,257,279	0	0%	0	0%	0	0%
New	**573,890**	0	573,890	573,890	0		0	0%	0	0%
Injection supplies	**211,427**	36,784	174,643	211,427	0	0%	0	0%	0	0%
Personnel	**2,438,042**	**368,632**	**2,069,410**	**2,438,042**	**347,383**	**94%**	**0**	**0%**	**347,385**	**14%**
Salaries of full-time EPI health workers (immunization specific)	**741,730**	342,671	399,059	741,730	321,422	94%	0	0%	321,423	43%
Per-diems for outreach vaccinators/mobile teams	**1,572,293**	0	1,572,293	1,572,293	0		0	0%	0	0%
Per-diems for supervision and monitoring	**124,020**	25,961	98,059	124,020	25,961	100%	0	0%	25,962	21%
Transportation	**374,698**	**0**	**374,698**	**374,698**	**0**		**0**	**0%**	**0**	**0%**

Cost category	Future resource requirements Total 2016-2020	Funding from all sources			GAVI HSS/ISS					
		Secured	Probable	Total	Secured	% of All secured funds	Probable	% of all probable funds	Total	% of Total funds
Fixed Site Strategy (Incl. Vaccine Distribution)	**356,855**	0	356,855	356,855	0		0	0%	0	0%
Outreach strategy + Mobile strategy	**17,843**	0	17,843	17,843	0		0	0%	0	0%
Maintenance and overhead	**445,243**	**80,221**	**365,022**	**445,243**	0	0%	0	0%	0	0%
Cold chain maintenance and overhead	**424,488**	76,233	348,255	424,488	0	0%	0	0%	0	0%
Maintenance of other capital equipment	**20,755**	3,988	16,767	20,755	0	0%	0	0%	0	0%
Building Overheads (Electricity, Water…)				0	0		0		0	
Short-term training	**921,721**	107,429	814,292	921,721	61,080	57%	0	0%	61,081	7%
IEC/Social Mobilization	**578,417**	503,025	75,392	578,417	488,025	97%	0	0%	488,026	84%
Disease Surveillance	**232,221**	126,383	105,838	232,221	98,675	78%	0	0%	98,676	42%
Program management	**1,452,198**	1,365,950	86,248	1,452,198	1,360,950	100%	0	0%	1,360,951	94%
Other routine recurrent costs	**5,131**	5,000	131	5,131	0	0%	0	0%	0	0%
Subtotal	**10,259,266**	**3,252,586**	**7,006,680**	**10,259,266**	**2,356,113**	**72%**	**0**	**0%**	**2,356,114**	**23%**
Routine capital costs										
Vehicles (100% EPI)	**14,280**	0	14,280	14,280	0		0	0%	0	0%
Cold chain equipment	**107,899**	57,762	50,137	107,899	57,762	100%	0	0%	57,763	54%
Other capital equipment				0	0		0		0	
Buildings Construction (100% EPI)				0	0		0		0	
Subtotal	**122,179**	**57,762**	**64,417**	**122,179**	**57,762**	**100%**	**0**	**0%**	**57,763**	**47%**
Supplemental immunization activities (SIAs)										
MR Campaign (Children 9-59 months old)	**512,415**	**0**	**512,415**	**512,415**	**0**		**0**	**0%**	**0**	**0%**
Vaccines & injection supplies	**163,652**	0	163,652	163,652	0		0	0%	0	0%
Operational costs	**348,763**	0	348,763	348,763	0		0	0%	0	0%
JE Campaign (Children 1-10 years old)	**1,051,142**	**0**	**1,051,142**	**1,051,142**	**0**		**0**	**0%**	**0**	**0%**
Vaccines & injection supplies	**242,479**	0	242,479	242,479	0		0	0%	0	0%
Operational costs	**808,663**	0	808,663	808,663	0		0	0%	0	0%
Subtotal	**1,563,557**	**0**	**1,563,557**	**1,563,557**	**0**		**0**	**0%**	**0**	**0%**
Shared Health Systems Costs (EPI Portion)										
Shared Personnel Costs	**4,289,204**	**4,289,204**	**0**	**4,289,204**	**0**	**0%**	**0**		**0**	**0%**
Shared Transport Costs – Vehicles, Fuel and Maintenance	**2,930**	2,930	0	2,930	0	0%	0		0	0%
Shared buildings - construction				0	0		0		0	
Shared Buildings – Overhead				0	0		0		0	
Subtotal	**4,292,134**	**4,292,134**	**0**	**4,292,134**	**0**	**0%**	**0**		**0**	**0%**
Grand Total	**16,237,136**	**7,602,482**	**8,634,654**	**16,237,136**	**2,413,876**	**32%**	**0**	**0%**	**2,413,876**	**15%**
Routine Immunization	**14,673,579**	7,602,482	7,071,097	14,673,579	2,413,876	32%	0	0%	2,413,876	16%
Supplemental immunization activities	**1,563,557**	0	1,563,557	1,563,557	0		0	0%	0	0%