ETHIOPIA NATIONAL EXPANDED PROGRAMME ON IMMUNIZATION

COMPREHENSIVE MULTI-YEAR PLAN 2016 - 2020

Federal Ministry of Health, Addis Ababa

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ACKNOWLEDGMENT

Immunization cMYP is a key strategic and management document for National immunization programs that provide national goals, objectives and strategic directions that address all components of immunization system relevant to the country. The new cMYP (2016-2020) is the result of the collaborative work of the Federal Ministry of Health and partners working in health.

The Federal Ministry of Health would therefore like to express its special thanks for the tireless efforts of the technical team supporting the national immunization program for the successful preparation of the document in the shortest possible time. Our appreciation goes also to CHAI, WHO and UNICEF, for their financial as well as technical support without which it would have not been possible to prepare this document. The Maternal and Child Health (MCH) directorate would also like to acknowledge the ICC members and the cMYP review team for their active participation and constructive comments.

LIST OF ACRONYMS

AD	Auto Disabled Syringes
AEFI	Adverse Events Following Immunization
AFP	Acute Flaccid Paralysis
BCC	Behavioural Change communication
BCG	Tuberculoses Vaccine (Bacillus-Calmette-Guerin)
BPR	Business Process Re-engineering
CDC	Centres For Disease Control and Prevention
CMYP	Comprehensive Multi Year Plan
CSO	Civil Society Organization
DCI	Development Cooperation of Ireland
DHS	Demographic and Health Survey
DPT	Diphtheria-Pertussis-Tetanus Vaccine
DQA	Data Quality Audit
EHNRI	Ethiopian Health and Nutrition Research Institute
EOS	Enhanced Outreach Strategies
EPI	Expanded Programme on Immunization
ESARO	Eastern and Southern African Regional Office for UNICEF
FMOH	Federal Ministry of Health
GAVI	Global Alliance for Vaccine and Immunization
GIVS	Global Immunization Vision and Strategies
HAPCO	HIV/AIDS Prevention and Control Office
Hep.B	Hepatitis B
HEW	Health Extension Workers
HF	Health Facility
Hib	Haemophilus influenza type B.
HMIS	Health Management Information System
HPN	Health, Population and Nutrition group
HPV	Human Papilloma Virus Vaccine
HSDP	Health Sector Development Program
HSEP	Health Service Extension Program
HSS	Health Service Support
HW	Health Worker
ICC	Inter-Agency Coordinating Committee
ICST	Inter-country Support Team
IDS	Integrated Disease Surveillance
IEC	Information Education Communication
IIP	Immunization in Practice
IMR	Infant Mortality Rate
IPC	Inter Personal Communication
IPV	Injectable Polio Vaccine
ISS	Immunization Service Support
ITN	Insecticide Treated Bed Net
JRF	Joint Reporting Form
KABP	Knowledge, Attitude Behaviour and practice
MDG	Millennium Development Goal
MDVP	Multi-Dose Vial Policy
MLM	Mid-Level Management
MNT	Maternal and Neo-natal Tetanus
FMOH	Ministry of Health
NGO	Non-Governmental Organization

NIDs	National Immunization Days
NIP	National immunization Program
NNT	Neo-Natal Tetanus
OPV	Oral Polio Vaccine
PAB	Protection At Birth
PCV	Pneumococcal Conjugated Vaccine
PFSA	Pharmaceuticals Fund Supply Agency
RED	Reaching Every District
SIAs	Supplemental Immunization Activities
SNIDs	Sub-National Immunization Days
SNNPR	Southern Nations and Nationalities Peoples Region
SOS	Sustainable Outreach Services
TFI	Task force on Immunization
TOT	Training of Trainers
TT	Tetanus Toxoid
UCI	Universal Child Immunization
UNICEF	United Nations Children Fund
USAID	United States Agency for International Development
VMA	Vaccine Management Assessment
VPD	Vaccine Preventable Diseases
VVM	Vaccine Vial Monitor
WFP	World Food Program
WHO	World Health Organization
WPV	Wild Polio Virus
WRRT	Woreda Rapid Response Team

EXECUTIVE SUMMARY

The Federal Democratic Republic of Ethiopia is the second most populous country in sub Saharan Africa with an estimated population of approximately 92.08 million people[1] and the tenth largest by area with its 1.1 million square kilometres. The health service currently reaches over 93% of the population.

There are feasible child survival (strategies) interventions taken up by the FMOH to help attain the MDGs. These strategies provide conducive environment for the enhancement of immunization program. As a result, Ethiopia achieved the MDG4 goal of reducing under-five mortality by 2/3 from the 1990 baseline in 2012 three years before the 2015 target year. The under-five and infant mortality rates in 2014 were 64 and 44 per 1000 live births respectively. The health status of Ethiopian children is improving from time to time significantly.

The expanded programme on immunization was launched in 1980 with the objective of increasing the coverage by 10% annually. However, the coverage in the first 20 years was very low although during the 1990's good progress was observed through Universal Child Immunization (UCI). The reaching every district (RED) approach has been implemented in Ethiopia since 2004 in districts with poor immunization coverage and high dropout rates. As a result, the coverage showed marked improvement. DPT3 coverage increased from 52% in 2003 to 87% in 2014. The variation in coverage among regions, however, is large. Now, the Reaching every district strategic approach is recast to reaching every children/community strategic approach in order to deal with inequities within districts.

[1] 2015 projection estimate based on 2007 population census

Ethiopia joined the polio eradication initiative in 1996 and the first mass vaccination campaign was conducted within one year. The AFP surveillance system was established in 1997 and global targets for surveillance were first achieved in 2004.

The last indigenous case of wild poliovirus (WPV) in Ethiopia was interrupted in December 2001. Nevertheless, Ethiopia suffered several WPV importations between 2004 and 2008. Ethiopia had been polio free for more than four years from 2009 to 2012.

However, an importation of WPV in the Horn of Africa (HOA) with progressive increase in number and geographical extension was reported from neighbouring countries of Ethiopia in Somalia and Kenya In 2013. Due to high cross border population movement and low population immunity in Somali region of Ethiopia, 1 confirmed case of WPV1 was detected following importation from Punt land of Somalia to Injiro Kebele, of Geladi woreda, in Dolo zone. A total of 10 cases of wild poliovirus type I was reported from Dollo zone of Ethiopia Somali region in 2013 and 2014; and confirmed ambigious type VDPV2 reported in December 2014 from Nogob zone of Ethiopia Somali Region. The last imported WPV is reported in January 5, 2014.

A series of sub-national and national polio immunization days were conducted to control the outbreak. As a result of the serious interventions the outbreak is contained and Ethiopia removed from the outbreak list in March 2015.

Measles mortality reduction and MNT elimination activities are also being conducted. Case-based measles and NNT surveillance is integrated with AFP surveillance. The morbidity and mortality due to measles has been reduced dramatically. Many districts have become MNT-free.

Between 1999 and 2013, some 15 million women of childbearing age (aged 15-49) in 62 high risk zones in all regions except Addis Ababa, Harari, and Dire Dawa, received three rounds of the TT vaccine. Following the completion of TT *Supplemental Immunization Activities* (SIAs) in identified high-risk zones in Ethiopia, an MNTE pre-validation assessment was conducted in April 2011. The country was partially validated to have eliminated Neonatal Tetanus. FMOH in collaboration with Regional health Bureaus (RHB), UNICEF and WHO planned to complete the third round TT SIA activities in four high risk zones of in Somali Region and complete validation is planned for 2015/2016.

This cMYP (2016 to 2020) provides a framework to plan activities to achieve the major objectives of the immunization program as endorsed in the National EPI implementation guideline. Through the situation analysis key issues/barriers that impede the progress were identified.

The previous immunization cMYP now in its last year of implementation, covered the period from 2011-2015 and the two main priority areas indicated in the document were improving routine immunization coverage and introduction of new vaccines (PCV and Rota virus vaccines). The immunization coverage as measured by DPT-HepV-Hib3 was achieved 87% in 2014; and PCV10 and Rota virus vaccines were introduced as per the cMYP plan in 2011 and 2013 respectively.

Lack of regularly updating and mid-term review of the plan was identified as gaps in the previous cMYP. The new cMYP ensures that the strategies in the plan are sufficiently comprehensive using GVAP framework. The priority areas indicated in the new cMYP are increasing immunization coverage in all target population with all vaccines with a focus hard to reach areas, introduction of Inactivated Polio Vaccine (IPV), measles second dose, MR Vaccine, Men A vaccine, Human Papilloma Virus vaccine, and Yellow Fever vaccines, and improvement of vaccine supply management and cold chain capacity at all levels.

The primary objective of this strategic plan is to achieve at least 90% national coverage and 80% in every district with all vaccines by 2020. It is also planned to reduce the incidence of vaccine preventable diseases through integrated interventions that would strengthen the overall health system. The cMYP will be implemented within the framework of the GIVS in four main strategic areas and the Monitoring and Evaluation, accountability frame work of GVAP. The plan encompasses all components of immunization services: service delivery, vaccine supply, quality and logistics, disease surveillance and accelerated disease control, advocacy, social mobilization and communication and programme management.

The main implementers of the plan will be the FMOH and regional governments with material, technical and financial support from international and local development

partners. The framework of the cMYP should therefore form the foundation for all regions planning and implementation of immunization activities in order to support implementation efforts that lead to sustainability, equity, the desired high coverage and impact.

The total estimated budget of the cMYP is 1,137 million USD out of which, XXX million USD is immunization specific and the remaining is cost for health system strengthening and SIAs. The main partners financing the immunization program are GAVI (61%), National and sub national Government 33%, UNICEF (2%) and WHO (2%), and other partners (1%). The contribution of the government for the immunization specific financing will be 18%.

Monitoring and evaluation of the cMYP will be done regularly by regional health bureaus, FMOH and partners. An annual operational plan will be prepared at the national level based on this strategic plan. Woredas will develop detailed micro plans based on the national strategic plan and regions will aggregate the district micro plans to develop regional immunization plans.

CHAPTER ONE

COUNTRY INFPORMATION

1.1 General profile and demography

Ethiopia the oldest independent country, located in the North Eastern part of Africa, also known as the Horn of Africa, lies between 3 and 15 degrees north latitude and 33 and 48 degrees east longitude. It is the tenth largest country in Africa, covering 1,104,300 square kilometres (with 1 million sq km land area and 104,300 sq km water) and is the major constituent of the landmass. It borders with five countries - on the north and northeast by Eritrea, on the east by Djibouti and Somalia, on the south by Kenya, and on the west by the Sudan and southwest by South Sudan. There are topographic-induced climatic variations broadly categorized into three: the "Kolla", or hot lowlands, below approximately 1,500 meters, the "Wayna Degas" at 1,500-2,400 meters and the "Dega" or cool temperate highlands above 2,400 meters.

Figure 1: Map of Ethiopia, its location in Africa

Projections from the 2007 population and housing census estimate the total population for the year 2015 to be 92.08 million. Ethiopia is the home of a variety nations,

nationalities and peoples varying in population size from more than 33.7 million to less than 250 thousand spread across Regions of the country and with more than 80 different spoken languages. According to 2007 census, the country is among the least urbanized country in the world with 83.6% living in rural areas whilst 16.4% of the total population living in urban areas. The largest city in the country is Addis Ababa, the capital, with 3.35 million people estimates in 2015 which accounts for 3.6% of the total population. The average size of a household in Ethiopia is 4.8 (Mini EDHS 2014).

The pyramidal age structure of the population has remained predominately young with 44.98% under the age of 15 years, and over half (52%) of the population in the age group of 15 and 65 years. The population in the age group of over 65 years accounts for only 3% of the total. While the sex ratio between male and female is almost equal, women in the reproductive age group constitute 23.4% of the population. The average fertility trend in recent years has shown some significant decline from the 1990 level of 6.4 births per women to 4.1 births (Mini EDHS 2014), an average of nearly 2 birth drop per women in 24 years. The estimate also showed that there are variations in fertility trend among rural (4.5) and urban (2.2) areas with rural women having an average of two more births per woman compared to their counterparts in urban areas (Mini EDHS 2014). Whilst the population is still growing faster at an annual rate of 2.6 %, the lowest population growth is recorded for Amhara region, which is 1.8%, significantly lower than population replacement.

1.2 Administrative profile and Governance

Ethiopian constitution, introduced in 1994 created a federal government structure. It has three branches of governance and administration. The executive branch includes the Prime Minister, Council of Ministers and Council of State. The legislative branch have a bicameral Parliament consisting of the House of Federation or upper chamber and the House of People's Representatives or lower chamber, the latter being elected by popular vote from single-member districts to serve five-year terms. The judicial branch comprises federal and regional courts.

The Federal Democratic Republic of Ethiopia is composed of nine Regional States: Tigray, Afar, Amhara, Oromia, Somali, Southern Nation Nationalities and Peoples Region (SNNPR), Benishangul-Gumuz, Gambella, and Harari; and two City Administrations council of Dire Dawa and Addis Ababa. The regional states and city administrations are subdivided into 941 administrative Woredas (districts). A Woreda/District is the basic decentralized administrative unit and has an administrative council composed of elected members. The 941 Woredas are further divided into about 16,657 Kebeles (Rural 15,130 & Urban 1,527), the smallest administrative unit in the governance.

1.3 Socio-economic Situation

Ethiopia was one of the least developed countries in the world with an estimated per capita income of US$100 or US$720 in purchasing power parity terms in 2002. Ethiopia's Human Development Index (HDI) value for 2013 is 0.435 which is in the low human development category positioning the country at 173 out of 187 countries and territories. Between 2000 and 2013, Ethiopia's HDI value increased from 0.284 to 0.435, an increase of 53.2 percent or an average annual increase of about 3.34 percent.

The Government of Ethiopia has been implementing a comprehensive economic reform program over the past decade. This had an important bearing on developments in the health sector. The Government follows a market–based and agricultural led industrialization economic policy for the development and management of the economy. Currently the country is on finalization of GTP one and under preparation of GTP two and has made utmost effort to ensure the transformation from Agricultural to industrial lead economy. There have been a number of policy initiatives and measures taken in these directions which included privatization of state enterprises and rationalization of government regulation which the process is still ongoing. Ethiopia's economy depends heavily on the agricultural sector. Agriculture accounts for 83.4% of the labour force, about 43.2% of the Gross Domestic Product (GDP) and 80% of exports. The regular droughts combined with poor cultivation practices, make Ethiopia's economy very vulnerable to climatic changes.

Despite these obvious challenges, Ethiopia has shown an impressive economic growth over the last twelve years, although the per capita of 470 USD substantially lower than the regional average (Gross National Income, Atlas Method). . But, Poverty Head Count

Index has declined from the 2004/05, of Ethiopians lived in extreme poverty in 2004-2005 level of 38.7% to five years later this was 29.6%, which is a decrease of 9.1 percentage points as measured by the national poverty line, of less than $0.6 per day. The reduction in poverty has been more pronounced in rural areas than in urban areas. The overall economic dependency ratio for the country is estimated at 93 dependents per 100 persons in the working age group of 15-64 years.

During the SDPRP I period (2002/03 - 2004/05), real GDP grew on average by about 5 percent per annum. However, during the first three years of PASDEP period the country registered an average of double digit economic growth of 11.8% per annum with steady and strong positive performance in real GDP. This steady growth marks a significant progress, to realize Ethiopia's objective to become a middle-income country in the next one decade. Ethiopia as one of the least developed countries in the world, with an estimated Gross Domestic Product (GDP) per capita of $630 per year (2014 estimate) and with per capita health expenditure of USD 16.1 (NHA, April 2010).

Another important feature of the economic reform in Ethiopia is equal opportunity for women in the participation of the economic development of the country which is enshrined in the constitution. The Ethiopian Constitution recognizes the principle of equality of access to economic opportunities, employment and property ownership for women. Following this, the government has formulated a national gender policy, which recognizes equality between the sexes and sets up mechanisms for the improvement of women's conditions, such as the establishment of the Ministry of Women's Affairs. The main strategies employed to implement the national policy include gender mainstreaming in sector and development programs, advocacy and capacity-building initiatives. The health Sector has committed to strengthen the gender mainstreaming at all level of the health system through developing Gender Mainstreaming manual (2013) and actual implementation

1.4 General Health Status

The major health problems of the country remain largely preventable communicable diseases (including Vaccine preventable diseases for children) and nutritional

disorders. The country shows an improvement on prevention and control of communicable diseases as a result of an integrated effort made by the government and its partners like expanded immunization Program. Despite major progresses have been made to improve the health status of the population in the last two decades, Ethiopia's population still face a high rate of morbidity and mortality and the health status remains low in terms of quality and equity of services. Figures on vital health indicators from UN 2014 Report show a life expectancy of 64 years and an IMR of 44 /1000. Under-five mortality rate has been reduced to 64/1000 and more than 90% of child deaths are due to pneumonia, diarrhoea, malaria, neonatal problems, malnutrition and HIV/AIDS, and often a combination of these conditions. Although there has been a gradual decline in these rates during the past 25 years, still these are very high. When compares with other developed countries.

The Sector has developed the next 20 years visioning document to achieve the health outcomes that commensurate with lower-middle income country by 2025 and middle-middle-income country by 2035. The visioning National health sector plan of 20 years will be performed based on four series of five consecutive years to ensure the attainment of national goals. Revision of the health policy has been underway and expected to address for those issues which were not well focused in the current health policy. The Sector has prepared a comprehensive Health Sector Transformation Plan (HSTP) in alignment with the national Growth and Transformation Plan (GTP) two. Quality, efficiency and equity of services are major focus areas for HSTP.

1.5 Health System Organization

The health sector has implemented BPR for the last couple of years and introduced a three-tier health care delivery system which is characterized by a first level of a Woreda/District health system comprising a primary hospital (with population coverage of 60,000-100,000 people), health centers (1/15,000-25,000 population) and their satellite Health Posts (1/3,000-5,000 population) that are connected to each other by a referral system. A Primary Hospital, Health center and health posts form a Primary health care unit (PHCU) with each health center having five satellite health posts. The second level in the tier is a General Hospital with population coverage of 1-1.5 million

people; and the third a Specialized Hospital that covers population of 3.5-5 million. The expanded immunization program (Immunization service) is implemented it all tiers in Ethiopia. The Ethiopian Health care System is augmented by the rapid expansion of the private for profit and NGOs sector playing significant role in boosting the health service coverage and utilization thus enhancing the public/private/NGOs partnership in the delivery of health care services in the country.

Regions and districts have Regional Health Bureaus (RHB) and district health offices, respectively for the management of public health services at their levels. The devolution of power to regional governments has resulted in the shifting of decision making for public service deliveries from the center to largely under the authority of the regions and down to the district level.

Currently the PHC potential coverage has reached about 90%. Construction of health centers and primary hospitals are underway which will make the potential PHC coverage 100%. However, there is much to be done to improve quality of care. The rapid scale up in HEP capacities, especially health extension workers (HEWs) who has be strengthening by establishment of health Development army (HDA) , has resulted in substantial increases in outputs related to promotion, prevention, and service use, which represent real and considerable progress in access and equity of package of basic PHC services.

1.6 EPI Services Delivery

Democratization and decentralization of the health service has brought an opportunity for the EPI programme as the implementing bodies (woredas) are becoming more capable both administratively and economically to play a role in resource mobilization and allocation for immunization programmes in their respective areas. Some regions and woredas have already started allocating budgets for operational costs, and a few have started contributing for capital costs by procuring refrigerators. This financial contribution and commitment at every structure has shown primary ownership and responsibility for establishing good governance and for providing effective and quality immunization services. However, contributions for purchase of vaccines and injection materials by the regions and woredas have yet to be started.

1.7 Justification for the development of new cMYP

The cMYP 2011 -2015 will continue as indicated till the end of 2015 and a new one has to be developed for the next five years, 2016-2020 that has to be aligned with the Health Sector Transformational Plan I (HSTP I) which is in line with the recommendation of WHO/UNICEF guideline of updating the cMYPs within one year prior to the end of the current cMYP.

CHAPTER TWO

SITUATIONAL ANALYSIS

2.1 The Expanded Programme on Immunization in Ethiopia

The Expanded Programme on Immunization (EPI) was established by the World Health Organization in 1974 to control vaccine preventable diseases. In Ethiopian, EPI programme was launched in 1980 with the objective of achieving 100% immunization coverage of all children under two years old by 1990. In 1986, the coverage target was reset to 75% and the target age group was changed to less than one year old but progress in increasing coverage has been slow. With the introduction of new approaches known as Reaching Every Districts (RED) and Sustainable Outreach Services (SOS) for immunization in 2003, improvement has been documented. However, system-wide barriers related to geographic coverage still remain as gaps, requiring bridging approaches such as the Enhanced Outreach Strategy2, even as the country moves towards a more equitable geographical coverage with construction and staffing of 16,251 additional peripheral health facilities.

The routine immunization programme is funded primarily by partners and Government. The partners largely channel their funds through UNICEF and WHO. Whilst the bulk of vaccine costs are financed by GAVI for the new vaccine and UNICEF for some traditional vaccines, the government has also mobilized resources to cover the cost of vaccines for BCG, TT, 50% of OPV and injection materials for traditional vaccines since 2009, in addition to the salaries of staff. Funding for a number of other components such as technical support, cold chain equipment, transport equipment,

[2] The Enhanced outreach strategy covers 7 millions children with High Impact Child Survival interventions incl. Vitamin A supplementation, De-worming , Nutritional Screening and Targeted Supplementary Feeding.

social mobilization and some operational costs have been made available by WHO, UNICEF and other development partners (donor agencies). In terms of health financing and budget provisions, the government has taken steps to reallocate resources from urban hospital-based curative services towards more preventive and promotive care, targeting the rural population. The overall focus has been on communicable diseases, common nutritional disorders, environmental health and hygiene, safe and adequate water supply.

2.2 National Immunization Implementation Guideline

The Ethiopian immunization implementation guideline has been revised in 2015[3]. Children of under-one year of age and women of reproductive age group (15-49 years age) are the targets for the currently available EPI vaccines in Ethiopia (BCG, Measles, DPT-HepB-Hib or penta- valent, Rotavirus, Pneumococcus vaccine (PCV), OPV and TT). Moreover, it is directed in the implementation guideline to introduce Inactivated Polio Virus (IPV), measles-rubella, meningitis and yellow fever vaccines for less than one year children and Human Papilloma Virus (HPV) and Td vaccines between 2015 to 2019. The country's immunization schedule for the above listed vaccines strictly follows the WHO recommendations for developing countries. Although no booster doses recommended in routine EPI for childhood immunization, there are periodical supplemental doses for measles and polio.

Table 1: Immunization Schedule

VACCINATION FOR INFANTS			**WOMEN OF CHILD BEARING AGE (15-49 YEARS)**		
AGE	**VISIT**	**ANTIGEN**	**VISIT**	**INTERVAL**	**ANTIGEN**
Birth	1	BCG, OPV0	1	0 (as early as possible)	TT1
6 weeks	2	DTP-HepB1-Hib1,OPV1,PCV1, Rota1	2	At least 4 weeks after TT1	TT2
10 weeks	3	DTP-HepB2-Hib2,OPV2,PCV2, Rota2	3	At least 6 months after TT2	TT3
14 weeks	4	DTP-HepB3-Hb3, OPV3, PCV3, IPV	4	At least 1 year after TT3 if not, in subsequent pregnancy	TT4

[3] The draft is ready for endorsement by mid-2015

9 months	5	Measles	5	At least 1 year after TT4 if not, in subsequent pregnancy	TT5
6-59 months		Vitamin A Supplement		All post-natal mothers	Vitamin A Supplement

The use of static sites, outreach sites and mobile teams are recommended as appropriate strategies for delivering immunization services. According to the findings of the EPI cluster survey 2012, 97.1% of the urban surveyed health facilities and 89.2% of rural health facilities were found to provide routine immunization services regularly. Global goals and strategies related to specific disease control initiatives (vaccine preventable diseases) such as polio eradication, measles elimination, and maternal and neonatal tetanus elimination have been adopted in the national immunization implementation guideline.

2.3 Immunization Service Delivery

2.3.1 Implementation of cMYP 2011 -2015

The previous immunization cMYP covered the period from 2011-2015 and the two main priority areas indicated in the document were improving routine immunization coverage and introduction of PCV and Rotavirus vaccine into the national immunization programDPT3-HepB-Hib3 coverage of 96 % was planned to be attained by 2015 and the actual coverage for 2014 was 87% However, the introduction of PCV and Rotavirus vaccines was realised as per the cMYP document.

Still, lack of regularly updating and mid-term review was identified as weaknesses of the previous cMYPs. The new cMYP ensures that the strategies in the plan are sufficiently comprehensive, using GIVS frame work. The priority areas indicated in the new cMYP are increasing immunization coverage in all populations with all vaccines, particularly among those in hard to reach areas, introduction of new vaccines such as IPV, MR, MenA, HPV and Yellow fever and improvement of vaccine supply management and cold chain capacity at all levels. Equity and quality immunization services will be given due emphasis to be in line with national and global focus.

2.3.2 Routine Immunization

Immunization services are provided in most of the health facilities and as an outreach service for communities residing beyond 5 km from the static health facilities. Currently, almost all of the public health facilities provide immunization services, and some districts in developing regions are supported by mobile health care teams. Some private hospitals in Addis Ababa also provide immunization services. Immunization services are provided free of charge in public health facilities and facilities supported by NGOs. Service charges only are incurred to clients at private health facilities. The seven traditional , the underutilized Penta and the two recently introduced new vaccines (PCV and Rotavirus) are administered health facilities routinely.

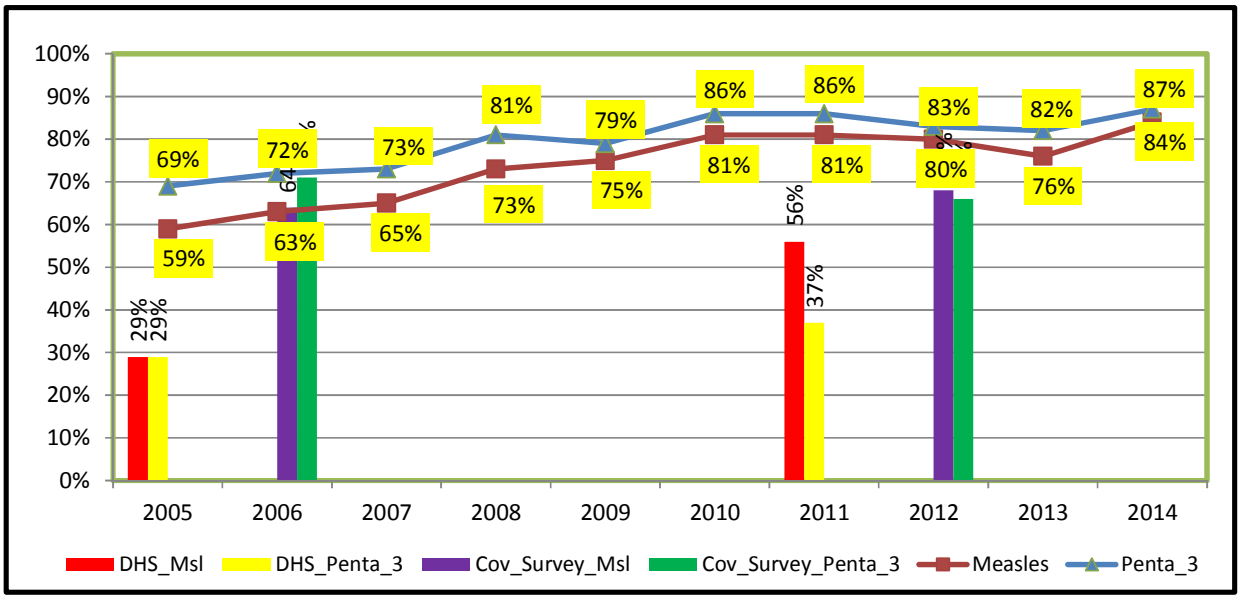
Immunization service provision has shown gradual increase since 2004 reaching 86% administrative coverage of penta 3 in 2010 and 2011. Despite this gain, there was decline in 2012 and 2013 to 83 and 82 respectively and with increasing once gain to 87% in 2014.

Ethiopia introduced the PAB method for TT immunization monitoring with the new HMIS in 2009. However, the PAB reporting was not uniformly implemented in the different regions and there was gross under reporting of PAB. As a result, the PAB coverage was very low in 2011. Since 2012, the reporting has markedly improved and in 2014, the PAB coverage was 80%.. Yet for the last three years, a decline in the national administrative coverage has been observed. See Table: 3 and Fig: 1

Table 2: Immunization Coverage in Ethiopia 2004-2014

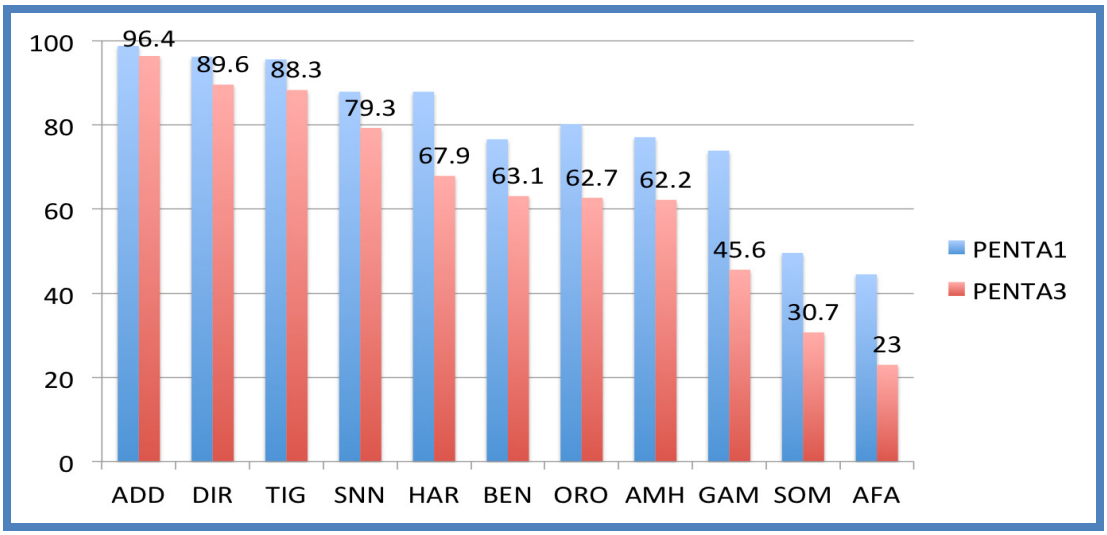
ANTIGEN	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
DPT1	75	78	80	81	87	87	90	86	95	91	93
DPT3	66	69	72	73	81	79	86	86	83	82	87
Measles	56	59	63	65	74	75	81	81	80	76	84
TT2+ PW/PAB	41	44.6	52.5	62	64	60	NDA	23	76	79	80

Figure 2: Routine EPI coverage (Penta3 & Measles) 2003 to 2014, Ethiopia (Administrative & Survey data)



In the most recent coverage survey conducted in 2012; significant regional disparities were observed (pastoral areas of Somali, Afar, Gambella are persistently low as compared to Addis Ababa or Tigray).

Figure 3: Ethiopia: EPI Coverage by Region, Coverage Survey, 2012



In 2014, the Ministry of Health (MOH), in partnership with UNICEF, and other bilateral agencies, has intensified efforts to improve routine immunization at peripheral levels. UNICEF and other EPI partners have been supporting a routine immunization improvement plan; implementation began in July 2014.

2.3.3 Reaching Every Child/Community (REC) Approach

The REC as RED approach was first introduced in Ethiopia in 2003. Implementation of the RED Approach was done in phases from 2004 and currently it is being implemented in all of the zones. To strengthen the implementation of RED, guidelines have been developed and distributed to the regions.

Evaluation of the RED approach was done in October 2004 and later in June 2015 by a joint team of WHO/AFRO, WHO/HQ, WHO/ICP and UNICEF/ESARO to review the impact of RED in zones and woredas where it was implemented. In general, improvement in DPT3 coverage was observed in most of the implementation areas, and it was recommended that the approach be rolled out to other areas.

2.3.4 Populations at risk of missing immunization services

Pastoralist communities throughout Ethiopia particularly in Afar, Gambella and Somali regions, have very low routine immunization coverage. In pastoralist areas where the health infrastructure is weak and populations tend to be sparse other approaches

should be considered other than the traditional static and outreach strategies. As such, in pastoralist regions there is a need to focus both on improving the quantity of services. In addition to the HEP, the FMOH encourages the use of mobile immunization teams to reach children whose families are mobile and those in hard to reach areas with immunization services.

The ERI strategy targets all children under one year of age at kebele level; the children are registered by HEWs and community volunteers and unimmunized children are provided immunizations at specific immunization sites in their respective kebeles. Children who are not brought for immunization are identified, followed up and vaccinated.

2.4 Supplemental Immunization Activities

2.4.1 Polio SIAs:

Following increased risk of importation of wild polio virus (WPV) from neighbouring countries, Ethiopia conducted subsequent polio SIAs at different times. In 2011, two rounds of polio SNIDs were conducted in 26 polio high risk zones bordering Sudan, Kenya and Somalia of which the second round was integrated with Measles SIAs. Another two rounds of polio SIAs were conducted in 22 high risk zones in October and December 2012 with administrative coverage of 99.8% and 100.7% respectively.

Following the outbreak of WPV in the Horn of Africa and considering the imposed risk and confirmation of the first case in Galladin woreda of Somali region, in June 2013, Ethiopia responded immediately by implementing subsequent polio SNIDs in high risk areas followed by two consecutive rounds of polio NIDs. The first emergency SIA response was conducted in Dolo Ado woreda of Somali Region from June 5-8, 2013 for the under 15 population in the five refugee camps and host community as well. Following these two consecutive rounds of SNIDs were conducted in June and July, 2013 in selected 22 high risk zones. The activity was also continued in August 2013 in the whole Somali region. Polio outbreak response guide was also prepared. Summary of the

SIAs (NIDs and SNIDs in the country in the period 2013 through 2015 with administrative coverage is shown in table 3 below:

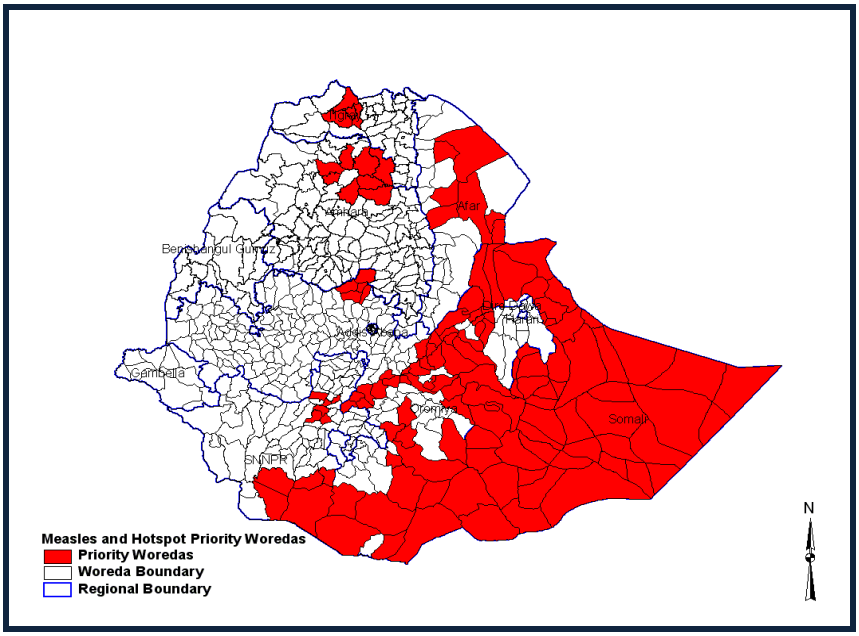
Table 3: Regional Polio NID Data of 2013 and 2014, Ethiopia

S.N	REGION	2013				2014		2015	
		1ST NID		2ND NID		1ST NID		2nd NID	
		VACCINATED	%	VACCINATED	%	VACCINATED	%	Vaccinated	
1	Amhara	2,476,463	94.6	2,487,147	93.9	2,501,716	90.6	2,629,169	9
2	Oromiya	4,607,196	94	5,533,222	99.6	5,786,154	103.8	6,000,225	10
3	SNNPR	2,846,170	101	2,929,571	100	2894731	97.4	3,030,823	10
4	Tigray	716,612	94.3	730,194	96.1	731,856	99.1	744,111	10
5	Gambella	61,711	102	53,376	95.7	61,036	104.1	62,342	10
6	B/Gumz	155,488	98.8	160,210	99.5	167,277	102.9	169,879	10
7	Afar	245,204	102	245,619	97.4	257,609	98.6	256,808	9
8	Dire Dawa	51,364	104	47,518	91.4	58,152	99.7	58,099	9
9	Harari	37,697	101	39,242	103	44,417	98.4	45,008	10
10	Addis Ababa	282,644	112	326,648	102	332,361	103.9	353,242	10
11	Somali	822,662	97.1	2,328,791 (U15)	90.7	936,416	98.5	939,461	9
Total		**12,303,211**	**96.9**			13,771,725	99.1	14,289,167	9

2.4.2 Measles SIAs:

In 2011, the impact of prevailing drought in the horn of Africa followed by influx of refugees from Somalia (mostly unvaccinated), increased incidence of measles with shift of age group above the age of five. The increased measles incidence coupled with the sub-optimal routine EPI coverage at zonal level (only 17% with at least 95% measles coverage by the end of 2010) initiated the need of emergency response with SIAs. The SIA was integrated with polio campaign and targeted children between 6 months to 15 years of age. It was implemented in 6 regions, 32 zones and 146 selected woredas. Selection criteria were set according to the existed drought situation and history of recent suspected or confirmed measles outbreak.

Figure 4: Measles SIA prioritized woredas, Sept-Nov2011, Ethiopia



During the period, a total of 7,034,264 eligible were vaccinated with measles vaccine with administrative coverage of 96.0%. Nationwide follow-up measles SIAs was conducted in 2013 from May 29 to June 5, targeting children between 9-59 months of age. In Somali, measles campaign was integrated with polio SIAs. Of the total 11,873,928 target children, 11,609,484 were vaccinated (98%) with RCS data of 96.4%.

Table 4: Showing Measles SIAs Data from 2011-2013

S.N	PERIOD	AREA OF IMPLEMENTATION	TARGET AGE GROUP	VACCINATED	COVERAGE (%)
1	December, 2011	146 woredas (potential risk of measles outbreak and high risk drought hot spot)	6 months to 15 years	7,034,264	96.0
2	June, 2013	All regions	9-59 months	11,609,484	98.0

2.4.3 Neonatal Tetanus Elimination

In 1999 WHO has estimated about 17,875 neonatal tetanus cases and 13406 NT deaths in Ethiopia which made the country to contribute to 4.6% of the global NNT deaths.

NNT is believed to be prevalent in the country due to low routine tetanus toxoid vaccination coverage coupled by the high number of deliveries handled by untrained personnel. In an effort to achieve the national target of less than one case of neonatal tetanus per 1000 live births the FMOH, in collaboration with EPI partners, started

implementing TT supplemental immunization since 1999, in high risk zones, , prioritizing in in Gedeo zone of the Southern Nations Nationalities and Peoples Regional State (SNNPR), aiming to administer 3 doses of TT vaccine to all women of child bearing age. Post campaign survey results showed that 85.4% of the women 15 - 49 years of age in that zone had received three doses of Tetanus Toxoid. Summary of the TT SIAs between 1999 and 2013 is shown in table 5 below.

Table 5: TT SIA coverage 1999-2013, Ethiopia (High risk strategy)

YEAR	NO OF ZONES	TARGET POPULATION	TT1 VACCINATED		TT2 VACCINATED		TT3 VACCINATED	
		(15-49 YEARS)	NUMBER	%	NUMBER	%	NUMBER	%
1999	1	152,020	145,939	**96.0**	142,899	**94**	123,136	**81**
2000	3	1,723,894	1,717,225	**99.6**	1,480,217	**85.9**	1,303,536	**75.6**
2001	5	2,030,778	1,968,673	**96.9**	1,709,201	**84.2**	1,465,284	**72.2**
2002	8	2,582,804	2,418,077	**93.6**	2,019,461	**78.2**	1,700,294	**65.8**
2004	9	2842250	2,690,784	**94.7**	2,292,989	**80.7**	1,795,391	**63.2**
2005	10	1,716,714	1,535,196	**89.4**	1,304,760	**76**	946,585	**55.1**
Sub Total	**36**	**11,048,460**	**10,475,894**	**94.8**	**8,949,527**	**81**	**7,334,226**	**66**
2007	**7**	1,246,621	1,204,537	**96.6**	1,147,068	**92**	1,035,826	**83.1**
2008	**11**	1,906,718	1,853,926	**97.2**	1,652,318	**86.7**	1,572,181	**82.5**
2009	**3**	80,005	76,012	**95.0**	69,820	**87.3**	67,079	**83.8**
2010	**2**	337,351	303,923	**90.1**	290,586	**86.1**	234,213	**69.4**
2010/12	**3**	387,547	355922	**91.8**	307139	**79.3**	288049	**74.3**
Sub Total	**26**	**3,958,242**	**3,794,320**	**95.9**	**3,466,931**	**87.6**	**3,197,348**	**80.8**
2012/13 sub total	**2**	**210,006**	**197,812**	**94.2**	**184,647**	**87.9**		
2013 sub total	**2**	**191,296**	**182,433**	**95.0**	151, 857	79%		
2014	**4**	401,402	173,203	**43**	151,857	**38**		
TOTAL	**70**	**15,809,406**	**14,814,432**	**94.0**	12,752,962	**81**	**10,531,574**	**84**

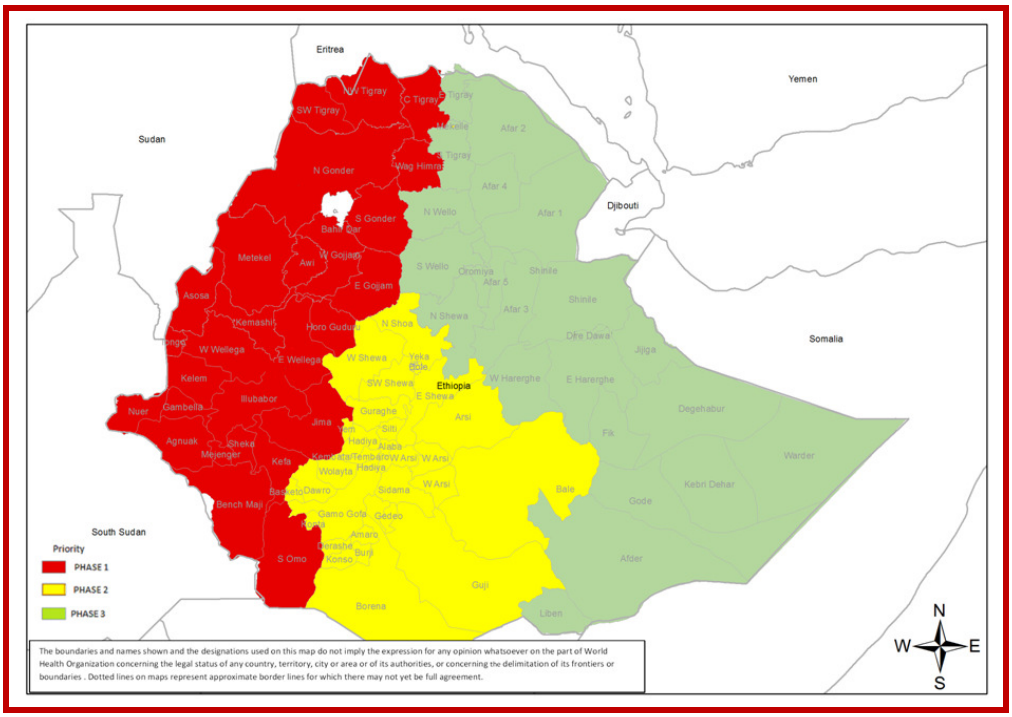
Following the completion of TT SIAs in identified high-risk zones in Ethiopia, an MNTE pre-validation assessment was conducted in April 2011. The assessment was carried out by global teams (including UNICEF and WHO) in high-risk areas of Afar, Benishangul Gumuz and

Gambella and in all zones of Ethiopia (except for in the Somali Region). The country was partially validated to have eliminated Neonatal Tetanus. For complete validation in 2015/2016,FMOH in collaboration with Regional health Bureaus (RHB), UNICEF and WHO planned to complete the third round TT SIA activities in four high risk zones of in Somali Region.

2.4.4 Men A Elimination campaign

Ethiopia has suffered major epidemics of meningococcal meningitis that occurs every 8-12 years. A risk assessment carried out early 2012 showed that 5 of the regions were at high risk, the remaining 6 regions were at moderate and low risk for meningitis outbreak. Accordingly; the country planned to introduce mass campaign for individuals between 1-29 years of age (70% of the total population) over three years period in three different phases from 2013 to 2015. The main objective of Men "A" campaign was set to eliminate epidemics of meningococcal meningitis caused by sero-type "A" from Ethiopia; thereby to reduce morbidity and mortality among the population by achieving ≥95% coverage in all target areas. The risk levels and the phases of the Men A SIAs is shown in Figure 6 below

Figure 5: Phase1, Phase 2 and Phase 3 Men A campaign sites in the country, Ethiopia



Summary of the first two phases of the Men A SIAs is shown table 6 below

Table 6: Data of phase I and II Meningitis "A" campaign in 2013 and 2014

S.N	PERIOD	AREA OF IMPLEMENTATION	TARGET	VACCINATED	COVERAGE (%)
1	October, 2013	30 zones in Tigray, Amhara, Gambella, B/Gumz, SNNPR and Oromiya regions	18,926,853	18,616,135	98.4
2	October, 2014	45 zones in Addis Ababa, Oromiya and SNNPR	26,910,795	26,268,708	97.6

The third phase of Men "A" campaign is planned for implementation in late 2015 targeting 15,833,812 individuals in the remaining 28 low risk zones.

2.5 Disease Surveillance and Accelerated Disease Control

2.5.1 Disease surveillance

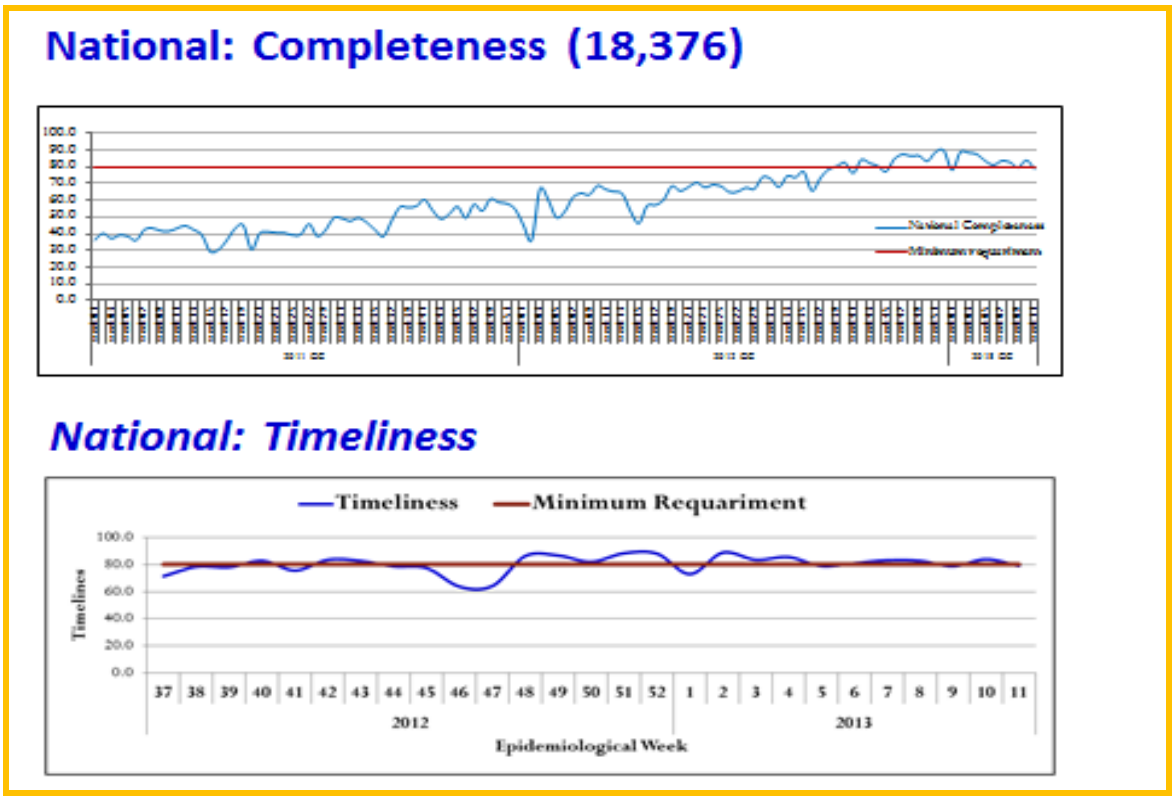
In Ethiopia, VPD surveillance is implemented within the framework for Integrated Disease Surveillance and Response (IDSR) strategy; the strategy that was adopted by the FMoH in 2001.

After the restructuring of the FMoH in 2009, the country adopted IDSR as part of Public Health Emergency Management (PHEM) and VPD surveillance became a component of the PHEM core process, at the federal level within the Ethiopian Public Health Institute (EPHI). The VPD surveillance infrastructure (human and logistics) have provided the platform on which IDSR implementation was rolled out nationwide.

PHEM guidelines have been developed in 2012 for the 21 diseases under surveillance, and specific guidelines for diseases and disease conditions such as AFP, Measles, MNT and Cholera surveillance have been finalized and PHEM trainings were conducted Since PHEM's establishment, there has been a steady increase in completeness of PHEM reporting. Community level data is captured by Health Extension Workers (HEWs) through community based surveillance volunteers. Recently, the establishment of the Health Development Army (HDA) has provided an additional source of community based data. Other community based surveillance structures have been established by PHEM and partners (including Core Group, JICA and WHO).

Case based surveillance of AFP, Measles, NNT, YF and sentinel surveillance for new vaccines; pediatric bacterial meningitis (PBM) and Rota virus gastroenteritis exists.

Figure 6: National Disease surveillance performance, in terms of completeness and time lines



2.5.1.1 AFP Surveillance

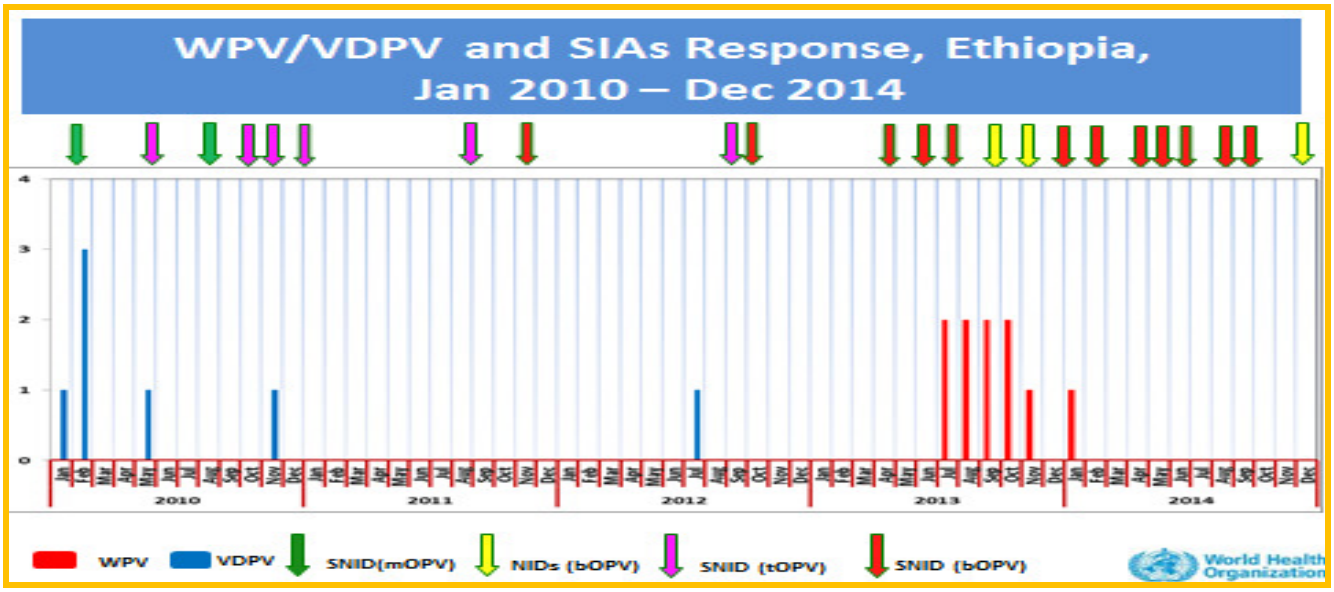
The Polio Eradication Initiative (PEI) in Ethiopia was started in 1996 following the Declaration on Polio Eradication in Africa in the same year. Ethiopia reported the last case of indigenous wild poliovirus in 2001. No case had been reported until 2004. The importation in 2004 which affected the northern part of the country was genetically

linked (I1C4) with virus that originated from Nigeria through Chad and Sudan. In 2005, Ethiopia had another importation that was genetically linked (I1C5) with virus circulating in Sudan. The WPV1 reported in 2006 (I1C5A) in the southern part of Ethiopia was genetically linked with virus circulating in Somalia. After the WPV in 2006, Ethiopia had a 17 months period when no WPV was detected until when two WPV1s were identified in Gambella region, bordering southern Sudan.

The first case of the 2008 outbreak was reported in southern Sudan in March and then detected in Ethiopia in April and May. Ethiopia responded by conducting 2 SNIDs in Gambella region bordering South Sudan reaching approximately half a million children. Due to limited availability of resources, the desired synchronization with South Sudan did not take place. In addition extra efforts were put in place to strengthen AFP surveillance that was sub-optimal in that particular region.

A total of 10 WPV1 cases were confirmed with date of onset of the last case on 5th January 2014. In response to the recent outbreak, 12 rounds of SNIDs and three NIDSs (two in 2013 and 1 in 2014) were conducted between June 2013 and December 2014

Figure 7: WPV/VDPV and SIAs Response, Ethiopia, Jan 2010-Dec 2014,



While the outbreaks in Ethiopia from 2004 through 2008/13 have been importations, the genetic cluster linkage reveals that the WPV1 are from the same genotype, and as

such, the virus may have been circulating in the Horn of Africa countries and being detected from time to time in certain regions of the country.

Nationally, AFP surveillance has been sensitive enough to identify polio cases including ambiguous and circulating vaccine derived poliovirus (cVDPV). Nationally AFP surveillance indicators of non-polio AFP (NP-AFP) and stool adequacy have been achieved; however sub national gaps have been identified. The other concern is the laboratory indicator of Non-Polio Enterovirus Rate (NPEVR) which has been declining, for the past four years to levels below the target of 10%.

Table 7: Summary of AFP surveillance indicators Ethiopia, 2011-2014

INDICATORS	TARGET	2011	2012	2013	2014
NP-AFP rate per 100,000 ≤ 15 Yrs	2.0	2.7	2.9	2.9	3.0
Stool adequacy	80%	88%	89%	87%	86%
Timelines and completeness of reporting of priority diseases	80%	94%	90%	85%	ND
Investigated ≤ 2 days of notification	80%	98%	93%	97%	97%
Specimen arriving at lab ≤ 3 days	80%	98%	99%	99%	97%
Specimen arriving in good condition	90%	91%	91%	82%	78%
Non-polio enterovirus isolation rate	10%	7.6	4.6	7.9	7.3
Timely Lab result within 14 days of receipt	80%	83%	76%	77%	81%
Proportion of AFP cases with zero/unknown doses	0	6%	6%	10%	11%
Number of cases with wild polio virus	0	0	0	9	1
Proportion of polio cases with zero/unknown/ doses	0	0	0	66%	0%

2.5.1.2 Measles surveillance:

Measles case based surveillance has been in place in Ethiopia since 2003, which was supplemented by laboratory surveillance starting from 2004.

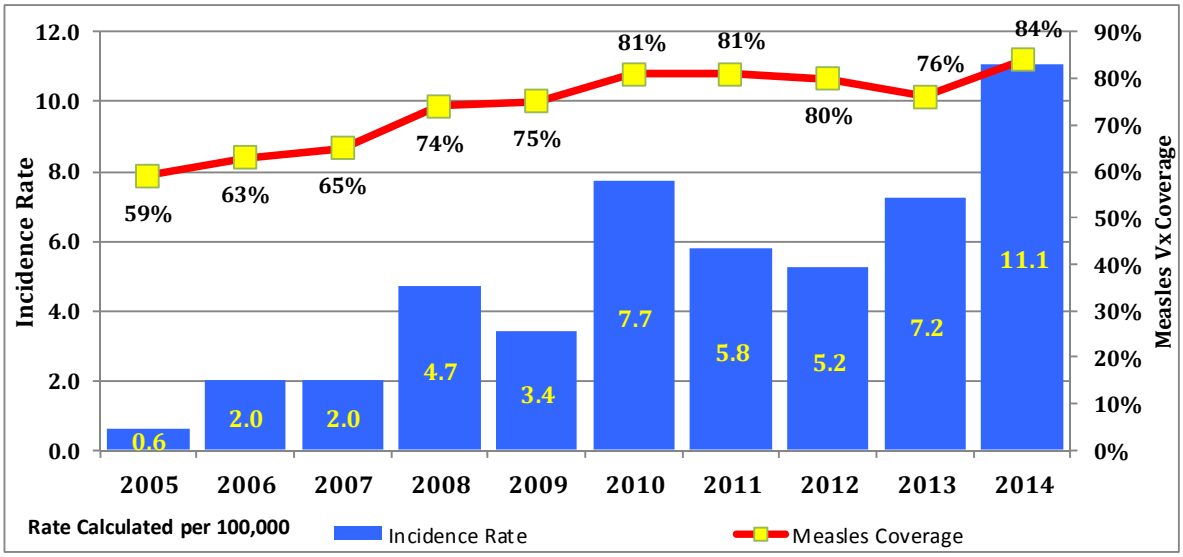
Major measles surveillance indicators were achieved over the past four years and the surveillance was able to confirm a number of cases and outbreaks. Available data shows that In Ethiopia, measles incidence dropped to 2.0 per million population during 2004 and 2005 but has been in excess of 5 cases per million (the target set for pre-elimination, see below) since 2010. In 2013, measles incidence was 7.2 cases per 100,000 populations. A total of 243 measles outbreaks were confirmed in 2013 compared to 146 in 2012 with a total of 192 affected woredas in 2013 compared to 125 in 2012.

Several rounds of measles campaigns have been conducted in the past as part of the regular follow up preventive campaign and also response to outbreak. The two recent measles vaccination campaigns were conducted in 2010/11 (measles best practice campaign) and 2013, targeting children below 9 years of age. However, measles outbreaks continue to occur in most parts of the country with nearly 70% of the reported cases among children less than 15 years. Epidemiologic data from the past several years show a decreasing proportion of measles cases in children under 5. This age group made up 56 % of measles cases reported in 2008 but only 30% of cases in 2014.

Table 8: Measles surveillance indicator, 2011-2014, Ethiopia

INDICATORS	TARGET	2011	2012	2013	2014
Annualized rate of investigation of suspected measles cases (/100,000)	>=2	7.3	5.1	6.2	6.0
Proportion of woredas with >=1 case per 100,000 with a blood specimen (%)	80	96	99	100	80
Proportion of reported measles cases with blood specimen (%)	80	100	96	99	91
Proportion of measles IgM+ (%)	<10	29	26	35	53

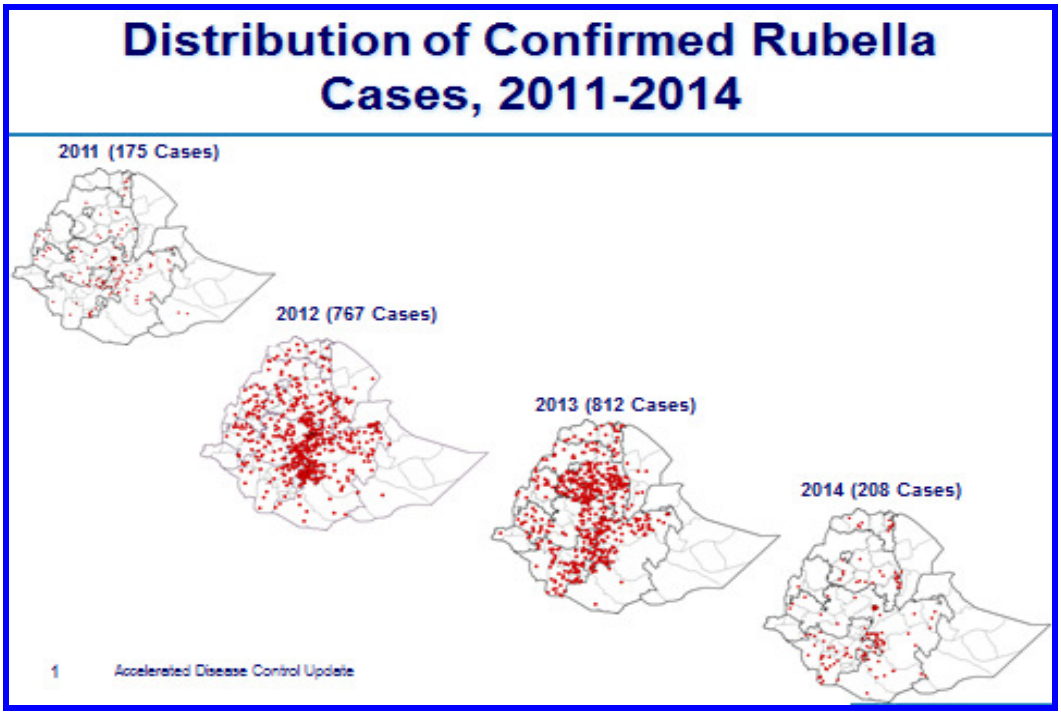
Figure 8: Measles coverage and measles incidence rate 2005-2014, Ethiopia



Ethiopia prepared measles elimination strategic document in line with the recent target set by the Regional Office, aiming to achieve measles elimination by 2020 (Resolutions AFR/RC52/R2). To work towards this elimination goals, Ethiopia developed, a strategic approach that includes: 1) conducting a high quality wide-age range campaign to boost immunity for persons aged up to 15; 2) building on improvements in routine immunization to achieve high coverage with first dose of MCV;3) supplementary immunization in the context of outbreak response as needed and 4) Introduce second dose of MCV in 2017.

The measles surveillance platform is also used to identify rubella cases, and as a result of the intensive case based surveillance for measles, which includes laboratory testing for the detection of rubella-specific IgM antibody in "measles IgM negative" cases. The incidence of rubella infection is unmasked for the first time in 2011. In addition to the increase in cases, a large rubella outbreak in the Benshangul-Gumuz region in late 2012 increased recognition of rubella disease in Ethiopia. Therefore, the effort is focused within the context of endemic transmission and with significant progress required to reach levels of population immunity to interrupt transmission in most areas of Ethiopia.

Figure 9: Distribution of confirmed Rubella cases, Ethiopia, 2011-2013



Though measles surveillance has identified outbreaks and cases each year and major surveillance indicators are achieved nationally, surveillance indicators are below target.

2.5.1.3 Neonatal tetanus surveillance

The elimination of neonatal tetanus (NT) – defined as a rate of <1 NT case/1000 live births in every district in a country – has been a global goal since 1989 when an estimated 800,000 deaths from NT occurred each year. Elimination of maternal tetanus was added to the program objectives in 2000 when UNICEF, WHO and UNFPA renewed their commitment to NT elimination, forming the Maternal and Neonatal Tetanus (MNT) Elimination Initiative.

Strategies for MNTE include High coverage with tetanus toxoid vaccine among pregnant women and in high risk areas in all child bearing age group; Access to clean delivery service; and effective surveillance. Efforts to reduce NNT in Ethiopia began in 1980 with the start of the EPI program which included TT immunization of women of reproductive age, particularly during pregnancy. This was further strengthened by declaring NNT as one of the immediately reportable diseases and enhancing case based surveillance using the AFP surveillance network and infrastructure. AFP and measles activities integrated

capacity building and sensitization on NNT surveillance for health workers and community members.

In April, the government of Ethiopia concluded that the country had likely eliminated maternal and neonatal tetanus as a public health problem and requested a formal assessment by WHO. In 2011, the country was validated (partially), to have achieved NNT elimination, except security-compromised Somali Region. Therefore, following the success of MNTE, the country entered in a new phase called sustaining elimination which requires:

- Continued strengthening of routine immunization activities for both pregnant women and children,
- Maintaining and increasing access to clean deliveries, reliable NT surveillance, and introduction of school-based immunization, where feasible

However, considering the population size and traditional value towards neonatal death there seems that there are unreported cases of NNT. In the past many years, nationally the number of reported NNT cases was below the acceptable number compared to the number of live births in the country. Low awareness among health workers and the community about NNT as one of the reportable diseases, its case definition and reporting process is a major gap.

2.5.1.4 Paediatric Bacterial Meningitis/Hib Surveillance

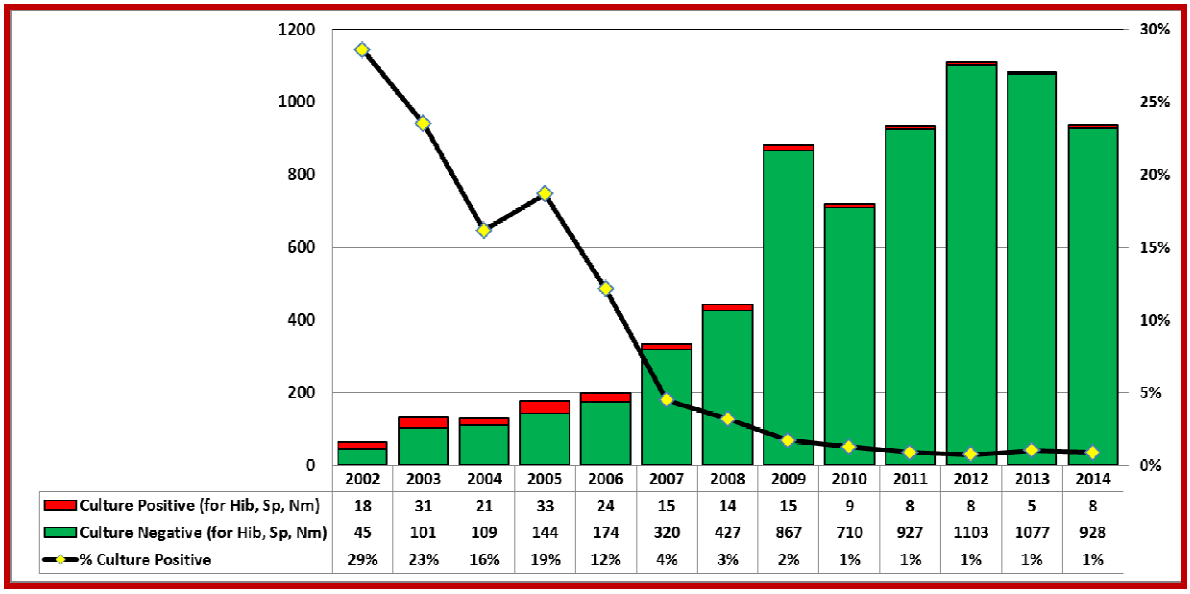
Three hospitals conduct sentinel surveillance for pediatric bacterial meningitis (PBM): Tikur Anbessa Hospital, (TAH), Yekatit 12 Hospital and Gondar University Hospital, since in 2002, 2008 and 2009 respectively. The sites are tertiary-level hospitals, and the aim is to provide information on the burden of disease, and determine disease epidemiology on genotype and serotypes. Hib and Hep B vaccines were introduced in the routine immunization programme in May 2007, while Pneumococcal Conjugate Vaccine was introduced in 2011

Key achievements:

- ☞ The sites are enrolling a significant number of cases; however the level of performance indicators varies widely among the three sentinel sites.

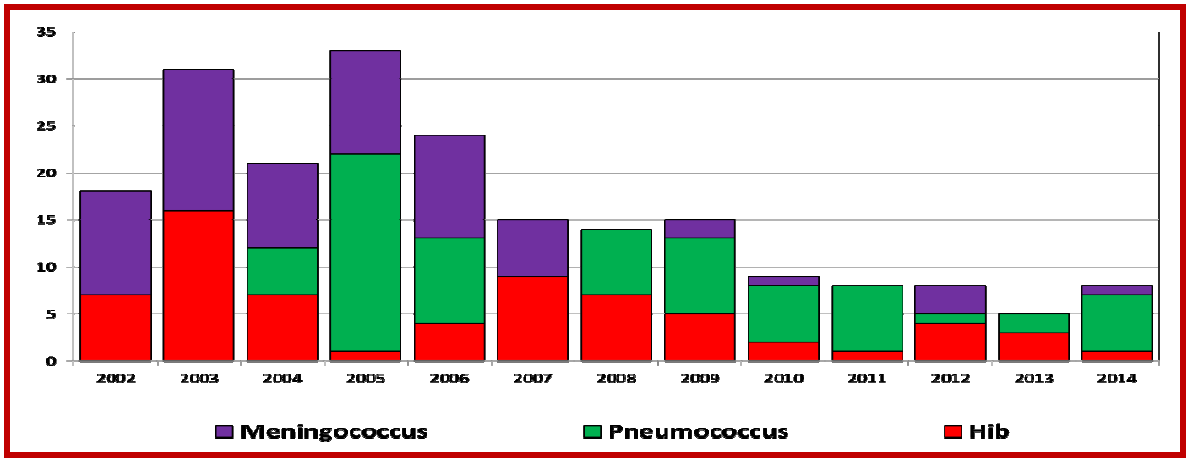
- ☞ Regular feedback is provided from the national level to the sentinel sites.
- ☞ A quarterly review meeting and refresher training were conducted
- ☞ Data is regularly analyzed and shared with the sentinel sites, EPHI, IST and AFRO.
- ☞ For quality check and genotyping, samples were sent to referral laboratories within the Regional Laboratory network.

Figure 10: CSF Culture results of suspected PBM cases, 2002-2014, Ethiopia



	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Culture Positive (for Hib, Sp, Nm)	18	31	21	33	24	15	14	15	9	8	8	5	8
Culture Negative (for Hib, Sp, Nm)	45	101	109	144	174	320	427	867	710	927	1103	1077	928
% Culture Positive	29%	23%	16%	19%	12%	4%	3%	2%	1%	1%	1%	1%	1%

Figure 11: Etiologies identified for PBM, 2002-2014, Ethiopia



2.5.2 Surveillance for New Vaccines

2.5.2.1 Rotavirus Surveillance

The ministry of health continued to work in collaboration with EPHI and WHO to monitor the epidemiological impact after rotavirus vaccine introduction. Surveillance activities were initiated in selected sentinel sites in 2007 at the Black Lion Hospital with further expansion to other two sites in Yekatit 12 and Betezata Hospitals in 2008 and 2011 respectively. Sentinel site coordinators and site members were designated and trained to coordinate and follow the day to day activities. Rotavirus vaccine was introduced in November 2013.

Key Achievements

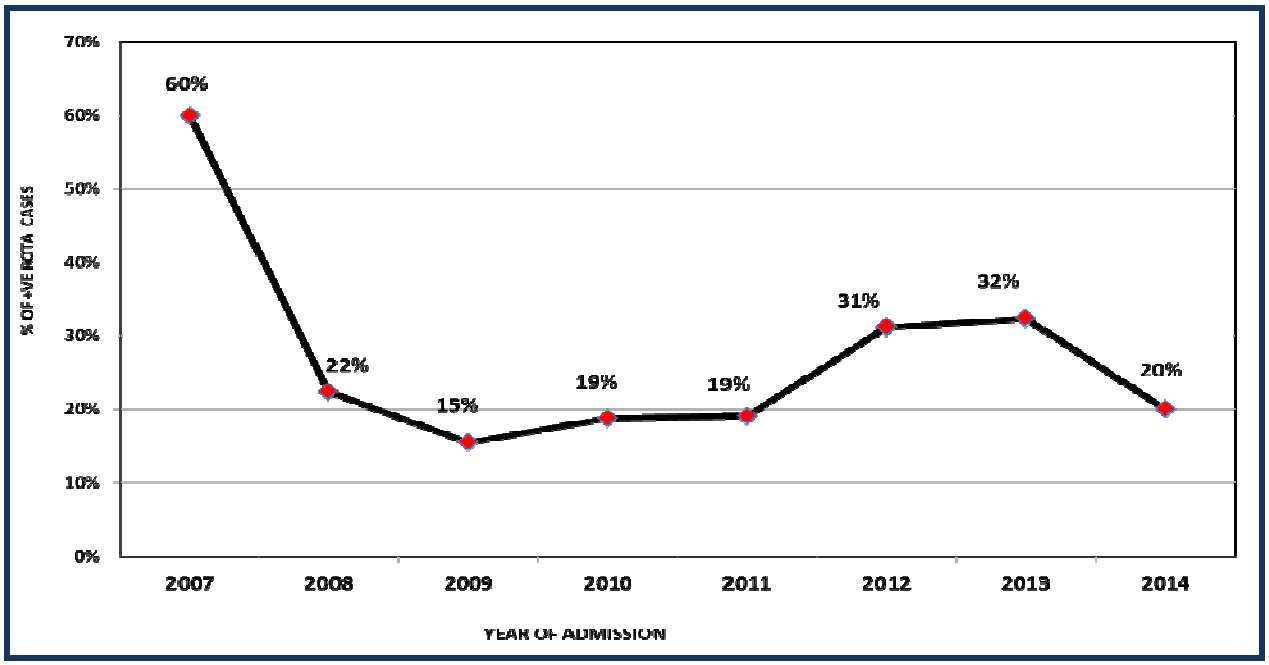
- ☞ The sites are enrolling a significant number of cases however the level of performance indicators varies widely among the three sentinel sites.
- ☞ A quarterly review meeting and refresher training are being conducted
- ☞ Data is regularly analyzed and shared with the sentinel sites, EPHI, IST and AFRO.
- ☞ For quality check and genotyping, samples are being sent to referral laboratories within the Regional Laboratory network.

Table 9: Rota Virus sentinel surveillance indicators, 2007-2014, Ethiopia

Indicator	*Target*	2007	2008	2009	2010	2011	2012	2013	2014
# of <5 acute diarrhea hospitalizations reported		60	210	454	533	524	295	352	310
% stool specimens collected within 2 days of admission	*>=90*	97	97	95	99	100	100	100	100

% of collected stool specimens that arrive at laboratory for testing	***>=95***	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
% of received specimens that are tested	***>=90***	**100**	**100**	**97**	**100**	**100**	**100**	**100**	**100**
(%) ELISA Rotavirus confirmed cases	***>=20%***	**60%**	**22%**	**15%**	**19%**	**19%**	**31%**	**32%**	**20%**

Figure 12: Rotavirus Positivity Rate, 2007-2014, Ethiopia



2.5.3 Accelerated Disease Control

There are twenty-four identified priority reportable diseases for the country, which includes measles, polio and NNT among the vaccine preventable diseases. Standard case definitions have been developed for all twenty-three priority diseases and health workers have been trained on the IDSR strategy. A Woreda Rapid Response Team (WRRT) has been established in each Woreda, and health facility focal persons are trained to coordinate the WRRT activities at health facility level. The main function of the WRRT is to analyse surveillance reports at woreda level and detect outbreaks for necessary intervention. The team prepares epidemic preparedness plans and submit them to woreda epidemic response committee for financial and logistic support. WHO supported the training of focal persons throughout the country on the IDSR strategy.

Epidemic response committees have also been established at zonal, Regional and National levels and these committees provide necessary support to woreda epidemic response committee and the WRRT.

2.5.3.1 Polio Outbreaks

For Polio, case-based surveillance has been introduced to identify outbreaks in a timely way. Training of health workers on outbreak investigation was conducted by WHO Surveillance Officers. At all levels, the Epidemic Rapid Response Team (RRT) are also responsible for the Polio Outbreak Response. All the six Wild Polio Virus importations (from 2004 till 20013) were detected timely and Polio SIAs were conducted in high risk areas to prevent transmission particularly in those regions which border countries with active polio transmission and high risk zones and regions.

2.5.3.2 Measles Outbreaks

Case-based surveillance for measles started in 2003. Since 2005 (Jan 2005 till Jun 2009) a total of 300 outbreaks were reported from all the regions. In 2009 alone a total of 60 measles outbreaks were reported in the country. The response to measles outbreak is guided by the National measles outbreak response guideline. Outbreak response is implemented by case management with Vitamin A supplementation and prioritising high risk areas for the follow up immunization campaigns.

Table 10: Situational analysis by accelerated disease control initiatives, Ethiopia 2011 to 2013

TYPE OF DISEASES TARGETED FOR ACCELERATED CONTROL	INDICATOR	2011	2012	2013	2014
Polio Eradication	OPV3 coverage	86%	83%	82%	87%
	Non Polio AFP Rate per 100,000 children under 15 yrs of age	2.5	2.9	2.6	3.1
	Stool Adequacy Rate	78%	88.5%	87%	87%
	Extent: NID/SNID No. of rounds Coverage range	4 NIDs >95%	8 SNIDS >90%	5 SNIDs and 2 NIDs	6 SNIDs & 1 NID; >90%
	Wild polio virus circulating	0	0	9	1
MNT elimination	Routine TT2+/PAB coverage	23%	66%	79%	77%
	Number of districts reporting > 1case per 1,000 live births	NA	NA	NA	NA
	Was there any SIA (Y/N)	Yes	No	Yes	Yes

Accelerated Measles Control	Routine Immunization Measles coverage	81%	80%	76%	84%
	No. of outbreaks reported	196	146	243	302
	No of woredas with outbreaks	143	125	192	249
	woredas that conducted Measles SIAs	146	0	824	ND

2.5.4 Laboratory Services

2.5.4.1 Polio Laboratory

The national polio laboratory located in the EPHI was accredited by WHO in 2001. In 2005, the laboratory proficiency test score and score of onsite review evaluation was 100% and 96% respectively, leading to full accreditation of the laboratory. Since its establishment the laboratory has scored an excellent proficiency test and onsite review evaluation scores. In 2009 alone, 93% of the lab reports were timely done within 14 days of receipt of specimens. In 2009 (January to July), a total of 1,498 stool specimens were collected and 10.7% of cases were positive for non-polio enterovirus and 4% primary isolates of polio virus were reported.*(the current laboratory capacity intra-type differentiation of Positive polio cases need to be included)*

The lab continues its reputation in all areas of work. In 2014 a total of 2641 stool specimens were collected and processed, and timeliness for reporting viral isolation results in 14 days after samples receipt was 80.9% the timeliness for reporting suspected isolates for ITD. On the other hand, percentage of L20B isolates confirmed as polio virus and score for the most recent viral isolation PT were 100% and 95% respectively, while score obtained on site review was 90%.

2.5.4.2 Measles Laboratory

The measles national laboratory is located in the same premise with polio laboratory and all the necessary resources such as equipment, reagents and trained personnel are available. The measles laboratory was accredited in September 2005. In 2009 alone, a

total of 3170 suspected measles cases were reported and 223 (19%) of the cases were positive for measles and 50 (4.3%) were positive for rubella specific IgM. Rubella tests are done on all cases which are negative for measles specific IgM.

In 2014, a total of 16,210 suspected measles cases were reported and 13, 305 (82%) of the cases were positive for measles; and 213 (10%) out of 2047 "Measles IgM negative" cases were positive for rubella specific IgM. *(Expansion of Measles laboratory need to be mentioned)*

The national measles lab established and maintained accreditation for the last couple of years, however, the vastness of the country and the work load at national measles lab, which tests over 5000 samples every year necessitate to establish sub national measles/rubella lab. Considering this and after several assessment both national and WHO expertise two labs Bahir Dar and Hawassa were selected and approved by AFRO to be sub national labs, and final preparation made including training of lab personnel.

2.6 GAVI support

Ethiopia has been benefiting from the GAVI support in particular the New Vaccine Introduction Support (NVS), Health System Strengthening Support (HSS) and GAVI CSO support in the last five years.

2.6.1 New Vaccines Introduction

Federal Ministry of Health/FMOH/ introduced Pneumococcal Conjugate Vaccine (PCV 10) on 16 October 2011 in the country. Similarly Rota virus vaccine was introduced in November 2013.

2.6.2 GAVI HSS

The country is also one of the first countries to use the GAVI HSS support to strengthen its health system. Ethiopia received 76.5 million USD from GAVI for four years. The fund was allocated to strengthening human resources for delivery of basic health services; to improve supply, distribution and maintenance systems, and to enhance the organization and management of health services delivery.

2.6.3 GAVI CSO support

Ethiopia has been one of the few pilot sites for the GAVI CSO support. The total amount of this support is US$ 3,320,000 for two years period. Five CSOs were selected and awarded with this fund and they are working on improving EPI services and its outcomes in hard to reach and low coverage areas.

2.7 Immunization logistics

Vaccine are very sensitive biological products, they lose their potency if they are exposed to a temperatures beyond the recommended ranges. Proper forecasting, procurement, handling, storage and distribution of the vaccine are vital in order to provide effective vaccines to protect children from vaccine preventable diseases.

The Immunization program in Ethiopia is adopting new initiatives and strategies aimed at increasing coverage and reducing 'drop-out' rate. A key prerequisite for the success of these initiatives and strategies is the communities' access to adequate supply of good quality vaccines that can only be assured through the establishment of an effective vaccine and cold chain management systems.

2.7.1 National Cold Chain Equipment inventory

Ethiopia has conducted national level cold chain equipment inventory in 2013. It was conducted with a major objective of quantifying and characterizing the condition of cold chain equipment throughout the country. Accordingly, the inventory was aimed to look into the functionality, models, source of energy and reasons for non-functionality of refrigerators/freezers. It also shows distribution of other cold chain equipment like the cold box and vaccine carrier.

Based on the inventory result, 20,660 refrigerators/freezers are available at different level of health structure (health post, clinic, health centre and hospital, woreda, zone and region). About 62% of the refrigerators/freezers at health facility level and 64% of

refrigerators/freezers at administrative level (woreda to region) were functional during the inventory. However the functionality varies across the regions.

Lack of maintenance due to shortage of trained cold chain technicians and spare parts are the major reasons for non-functionality of the freezers/refrigerators. Five models of refrigerators /freezers (RCW 50 EK, V 110 KE, V 170 EK, TCW 3000 and PR 265 KE) at health facility level represent more than 80% of all the models observed during the assessment. Kerosene and electricity are major sources of energy for almost all refrigerators/freezers. Solar is the least utilized energy source. Based on the 2013 inventory, there were 37,574 Vaccine Carriers and 13,079 Cold Boxes at health facility. Majority (57%) of the cold box and vaccine carriers were found at health post level. The country has developed a national cold chain rehabilitation plan from 2014 to 2018 following the cold chain inventory done in 2013.

2.7.2 Effective Vaccine Management Assessment

An effective Vaccine Management assessment (EVM) was conducted in 2013 with an overall aims of identifying areas of good knowledge and practices that need to be promoted and sustained. It will help the county to achieve and also helps to monitor high standards of performance in immunization logistics at all levels of the vaccine supply chain system.

A tool designed by WHO-UNICEF for the assessment of the Global EVM assessment was used. EVM performance scores were assessed for 10 Regional vaccine stores, 23 Zonal vaccine stores, 28 Woreda vaccine stores and 30 Health facilities. The main strengths revealed by the 'criteria' scores are in storage and transport capacities and qualitative aspect of the infrastructure used throughout the vaccine supply chain. The main areas of weakness are in storage temperature, stock management, distribution and to some extent gaps in vaccine management policy and procedures. Based on the assessment, effective vaccine management improvement plan is developed in each indicator to improve vaccine management in the supply chain system.

2.7.3 The cold chain Rehabilitation Plan *(inclusion in plan section)*

The vaccine cold chain is not only an integral part, but the very backbone, of an immunization programme. It is a system for storing and transporting vaccines at recommended temperatures from the point of manufacture to the point of use, thus ensuring the potency and safety of vaccines throughout the transport and storage phases.

The cold-chain system has to be rehabilitated periodically and expanded to meet the changing requirements of an immunization programme. Managers are encouraged to use this process to improve quality of service, increase efficiency of the system and reduce operational costs. The rehabilitation planning process should involve an assessment of the impact of expected changes on the required capacity at each level of the programme.

In the context of Ethiopia, Equipment lifespan, working status, the shift from Kerosene refrigerators to electric and solar driven cold chain equipment, the expansion of the immunization services close to community, the introduction of new vaccines and other interventions such as polio, measles and TT campaigns were the key reasons for the development of the cold chain rehabilitation and expansion plans. To achieve a comprehensive rehabilitation and expansion plan, a team has considered the following key issues:

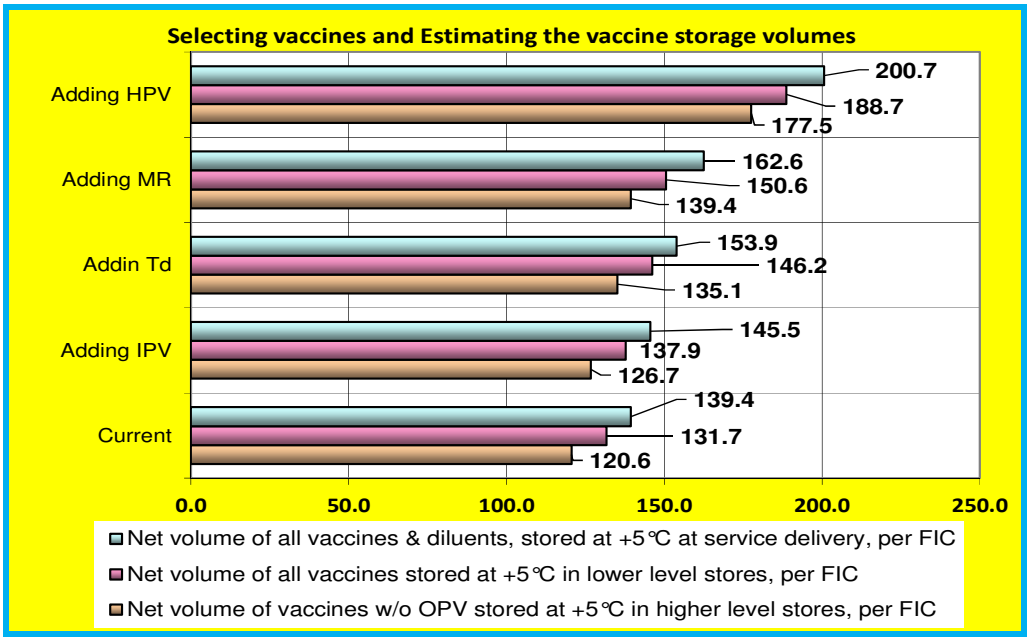
- ❖ Analysis of programme parameters and plans
- ❖ Evaluation of the 2013 national cold chain inventory data
- ❖ Key assumptions for the development of the plan
- ❖ Estimation of the replacement and expansion requirement
- ❖ Selection of appropriate cold chain equipment
- ❖ Development of replacement and expansion plan with budget estimate
- ❖ Identification of spare parts requirement as per the plan

2.7.4 Rehabilitation Plan: Implementation

Estimation of required cold chain capacity at each levels; In order to estimate the required cold-chain capacity at each level, first estimation of the maximum net storage volume for vaccines required for target individuals and fully immunized child was carried out and followed by actual estimation of the capacity required for the given storages and service delivery levels.

The net storage volume of vaccine required for target group is influenced by type and number of antigens in the national vaccination schedule, introduction of new vaccines in the national vaccination schedule, form and Presentation of vaccine vial size, the expected coverage and wastage rate for each antigen, number of supply period that affect the maximum stock level in the country and safety stock levels and the agreed % storage space dedicated for other interventions such as number of campaigns or supplementary immunization activities. Since the target group for each antigen varies, estimation of the capacity required per target group method is used to estimate the volume requirement. The graph below summarizes the result to illustrate the new vaccine introduction plan impact on the cold chain capacity in terms of fully immunization child.

Figure 13: New vaccine introduction plan and estimating the need for vaccine storage volume (men A and yellow fever not included)



2.7.4.1 Estimation of available cold chain capacity *(to be transferred to plan section)*

According to the national cold chain inventory, the following key findings are considered for the replacement:

- ✓The inventory established that 3,357 refrigerators and freezers are age of more than 10.
- ✓5,997 refrigerators and freezers are age of between 5 and 10 years.
- ✓8,504 refrigerators and freezers are of age between 1 and 5 years.

There was a number of equipment operating not in optimal energy source which required replacement. The rehabilitation exercise is used to phase out and replace all refrigerators running on kerosene and with the age of more than five years. In general there are 7,668 refrigerators using kerosene as energy sources.

2.7.4.2 Cold-chain replacement plan and budgeting

The status of cold-chain equipment and the future requirement of vaccine storage capacity are the guiding principle for expansion and replacement of cold-chain equipment at different levels.

The role of the replacement plan is twofold. It serves;

A. To calculate and plan replacements over a selected period of time, in this case the next five years, and when; and
B. As a tool to monitor implementation of the equipment replacements.

Furthermore, this plan will be used as an efficient means to communicate the equipment needs to donors. This example also guarantees transparency of distribution of the new equipment once it is received in a country.
A list of criteria and schedule a time period for replacement has been drawn in planning cold-chain equipment replacement.

2.7.4.3 Criteria for cold-chain equipment replacement and expansion plan

Equipment replacement and expansion plan has been established through a list of criteria to be followed for deciding the priority in which replacement or supply should be made. These are:

- ✓**1st priority**: (a) Filling the gap as per the current and Plan; (b) Refrigerators and freezers which do not comply with the PQS or PIS or which are "obsolete" and not usable to be replaced.
- ✓**2nd priority:** Absorption refrigerators which are 10 years and older as the life span of the equipment and the strategy to slowly start the phase out of kerosene refrigerators for the transition to electric or solar equipment.
- ✓**3rd priority:** Compression refrigerators and freezers which are above 10 years of age but which are not vestfrost and Dometic brand. The life span of compression refrigerator may vary according to specific conditions and models of equipment. Hence, due consideration need to be given further during the implementation phase.
- ✓**4th priority:** Refrigerators and freezers which PQS/PIS status is unknown. Due to the cold chain inventory data, further emphasis need to be given to this criterion during the implementation phase by getting more precise data.
- ✓**5th priority:** Absorption refrigerators which are of age between 5 and 10 years considering the 5 year plan and the strategy to further progress with the gradual phasing out of kerosene refrigerators as a transition to either electric or solar equipment.

Additional considerations:

The planning cycle covers five years.

- ✓All Health Centres are clustered in two population age range to ease the equipment selection for the level: HC with catchment population of less than 25,000 population and HC with population above 25,000.
- ✓HC with population up to 25,000 are 75% of the 3245 HC currently in the country. The remaining 25% HC are of population below 25,000.
- ✓60% of the HC are considered to have electricity as energy sources where as 40% of the HC do not have access to electricity (solar as alternative energy source).
- ✓Health Posts where considered in two categories: Pastoralist and Agrarian. Pastoralists are in Afar, Somalia, Benshangul Gumuz and Gambella.
- ✓75% of the Health Posts in pastoralist area are considered to be equipped with cold chain equipment that is working with solar energy source.
- ✓33% of the Health Posts in agrarian area are considered to be equipped with cold chain equipment using the concept of one equipment for three. 60% of the HPs in these areas are considered to have electricity as energy sources where as 40% of the HP do not have access to electricity (solar as alternative energy source).

Remarks:

Replacement of all absorption equipment of age 5 and below is not considered to be replaced in the 5 years. The next phase of the plan will address this condition. Following the equipment selection and the replacement and expansion plan, budget estimation will take place to translate into projected costs for a multi-year financial plan. The following points were taken into consideration while costing the rehabilitation plan:

- ✓Prices provided in the PQS used are “Freight on Board” (FOB) – that is, the price at the factory gate; transportation and insurance costs are not included.

- ✓Price lists are not always up to date so it is advisable to request specific prices for selected items.
- ✓The cost of products that are new to the market can be expected to decline several years after their introduction.
- ✓Hidden or associated costs are not considered in the budgeting.
- ✓15% are added to the cost of equipment for surface transportation
- ✓5% are considered for further transport costs within the country.
- ✓Transportation costs for solar refrigerators can be higher because solar refrigerators are often installed in remote areas.
- ✓Installation costs are not included in the cost.

2.7.5 Transition Plan

FMOH and developmental partners are supporting the vaccine transition plan at PFSA where phased approach will be implemented to successfully transit and become a model to most African countries. During phase I, transition will take place in three selected hubs and eight months later, a national scale up to all PFSA hubs will be in place up to zonal level. While engaging and building the capacity of PFSA in managing vaccine logistics and cold chain equipment, vaccine will be delivered to directly to woreda health office and health center by PFSA. Limiting factor for successful transition of the plan is:

1. Refrigerated trucks: Seventeen cold rooms and 5 cold rooms procured by GAVI and UNICEF increases the gross national cold chain capacity by 880 cm3. In addition, GoE has committed to construct cold room at airport to be managed by PFSA trained staffs to avoid any delay in clearance and avoid vaccine congestion at cargo. The investment to construct cold room by government and developmental partners is very much promising for the transition plan. However, more capacity building activities has to be done in areas of distribution.

The total volume required to store a one quarter consumption of antigens for routine immunization is 235 CBM and the volume will add up to 271 CBM considering HPV and IPV which are on the pipeline. Hence, in order to distribute vaccine from the center to the hubs, 54 refrigerated trucks (Van) is required. Currently, 17 refrigerated trucks are available and start to provide service. Since distribution is a major challenge in vaccine distribution, having one more refrigerator to each hubs and an addition three to central PFSA with a total quantity of 20 refrigerated trucks will help to fill half of the gap in vaccine distribution.

2. In addition, PFSA hubs are currently providing service to health facilities with an average of 15 route map. Accordingly, there will be more than 270 routes for direct vaccine delivery to health centers. Therefore, Hubs needs to be equipped with refrigerated pick up vehicles for vaccine delivery to health centers and procuring 25% of their needs (67 refrigerated pick up vehicles with GPS) will hasten the distribution process over the next 5 years

3. Human Resource Development: Even though vaccine management transition responsibility is given to PFSA, experience with in the agency in managing the cold chain capacity is limited and it is mainly associated with non-EPI keep cool items. Hence, in order to successfully transit and also to become a model for other countries, technical assistants that support the transition process and with a very good experience on supply chain system design ,vaccine management and knowledge of vaccine commodities, strong data analysis skill, good overall consulting skills and knowledge and previous experience of vaccine supply chains is required. Hence, the support will be used to recruit 3 Technical Assistants for each Hub with a total number of 54 Technical Assistants for 2 year period.

2.7.5.1 Standby generators

WHO and UNICEF recommend all primary vaccine stores should be fitted with a stand by generator with automatic start up, regardless of the reliability of the main power supply. In addition to the above it is highly recommended installing standby generators in the following situations:

- ☞ At large intermediate vaccine stores, equipped with cold rooms.

- ☞ At other sub-national stores where the mains power supply is sufficiently unreliable to compromise the performance of ice-lined refrigerators, even when they are fitted with voltage stabilizers.

- ☞ In all other situations, if power cuts are a chronic problem, review alternative solutions such as ice-lined appliances fitted with voltage stabilizers, photovoltaic equipment, or equipment which runs on kerosene or bottled gas. The decision to purchase a standby generator should not be taken lightly since it involves an investment of several thousand dollars, together with significant maintenance and training costs.

Electric supply for sufficient duration is essential for maintenance of cold chain environment required for vaccines. In the event of continuous power failure for more than 4 hours, WIC/WIF require alternative power source such as diesel generators. Typically one generator of 15 KVA is needed to operate one WIC or WIF. Therefore, with every new installation of WIC/WIF, a diesel generator (along with AMF panel) is required.

2.7.5.2 An on-going efforts

Cold-chain equipment system strengthening

The vaccine cold chain is plagued with a high rate of non-functional (32.6%) equipment as established by the national cold chain inventory of 2013.

The cold chain maintenance system is not performing satisfactorily because it suffers from several issues:

- ☞ Lack of a management system to swiftly and effectively address all breakdown and repair requests
- ☞ Poor organizational structure and staffing of the repair and maintenance functions: e.g., lack of a competent focal person at district level, unclear hierarchy and job description, inefficient coordination across actors;

- ☞ Lack of standard operating procedures for the different actors: e.g., how to trigger a repair request, how to conduct preventive maintenance;
- ☞ Inadequate resources and resource mobilization for maintenance operations, e.g., funds for transportation and per diem of cold chain technicians;
- ☞ Lack of proper reporting of cold chain equipment status to enable effective management and monitoring of cold chain assets (including lack of an updated cold chain equipment database);
- ☞ Miss management and mal-distribution of shortage of spare parts;
- ☞ Insufficient tools to carry out repair and maintenance;
- ☞ Inadequate planning, implementation and monitoring of preventive and curative maintenance.

Cold chain equipment maintenance system assessment and workshop was conducted on (month and year); 19 senior level technicians trained in cold room and compression refrigerators maintenance; complete maintenance tool kits procured and distributed to all districts, cold rooms, zonal health departments and regional health bureaus. More than 200 mid-level technicians received on job training through maintenance campaign. Maintenance manuals for three (Senior, Mid-level and users) level developed, printed and distributed.

To strengthen cold chain equipment maintenance system in a sustainable way the following activities will be implemented:

- ☞ Development of the cold chain equipment maintenance structure at all level.
- ☞ At regional health bureaus and zonal level structurally trained cold chain technicians or biomedical technicians will be assigned. At district/ woreda level there will be cold chain or maintenance activities, immunization officers will be trained and manage.

1. Cold chain training
   - ✓ Currently there is three levels of training.
   - ✓ Senior level – senior level cold chain technicians training is for national, regional and zonal level cold chain or a biomedical technician, which is given for more than 4 weeks.
   - ✓ Mid-level technicians- Mid-level cold chain training is for woreda level officers and the training for two weeks.

- ✓ User level – User level training is given for end users on preventive maintenance for one week time.

2. Procurement of spare parts and their management: In addition to procurement of the spare parts, to solve the current spare parts management cold chain equipment data base will be developed.
3. Cold chain equipment maintenance campaigns:

Currently about 32.6% of vaccine refrigerators are non-functional. As a short period plan, To improve cold chain equipment functionality, Cold chain equipment maintenance campaigns and practical on job training for senior and mid-level technicians and users (for those previously trained by UNICEF and government) will be conducted.

2.7.6 Available storage capacity

National level

The recent national cold chain equipment inventory was conducted in 2013. One of the objectives of the inventory was to evaluate per level all logistical aspects (storage capacity, working status and distribution) as well as identify immediate and long-term requirements to meet current and future Expanded Program on Immunization (EPI) needs. The findings of the 2013 inventory showed that, unlike 2008 where there were only 9,880 refrigerators, there were 20,583 refrigerators and 50% were age less than 5 years. This indicates that the aged cold chain system was replaced by new ones and the refrigerators in the country have more than doubled.

Currently the total gross available positive temperature storage space at central level is 1,095,000 litters; 240,000 litters at the old vaccine store (Urael) and 856,000 litters of the new cold rooms at PFSA compound. Taking a ratio of 3.5 of equipment factor for cold rooms a net 312,857 litters positive storage capacity is available at national level.

The currently available 312,857 litres of positive cold chain storage space at national level, with the assumptions of two shipments will be adequate to accommodate the introduction of new vaccines.

The available cold storage at national level is adequate for the routine immunization including IPV. But with the introduction of new vaccines and Supplementary Immunization activities there is a requirement of additional cold rooms. As a result additional ten positive cold rooms of 100m3 of gross storage volume each are being constructed in the PFSA compound. This will increase the net volume by 350 m3 (or 350,000 litters). Table 1 depicts the currently available and future cold chain requirements.

Table 11: Current available net storage capacity and future requirements for positive cold chain storage at central level (bi annual requirement)

YEAR	2016	2017	2018	2019	2020
Annual positive volume of vaccines, including new vaccines in liters	366,564 lit	457,467 lit	470,760lit	483,000 lit	495,558 lit
Available storage capacity	383,250 lit	383,250 lit	383,250 lit	383,250 lit	383,250 lit
Number of consignments / shipments per year	2	2	2	2	2
Gap	0	0	0	0	0

By mid-2015 there are about 33 vaccine cold rooms and 1 freezer room at 16 locations of the countries including the central vaccine store. At national level and 9 regions with a total cold storage gross capacity of 1837 m3 and 45 m3 gross freezing storage capacities for EPI. It is also expected that more than 20,800 refrigerators and freezers are available in the EPI program of the country. Since 2009 the management of the cold rooms located at central level are under PFSA, whereas the regional and zonal level cold rooms are still under by respective regional health bureaus and zonal health offices.

To ensure regular and smooth flow of all medical supplies including vaccines and other cold storage requiring health commodities to all health facilities, PFSA has been mandated by the government to procure and store all health supplies and deliver up to health facility level.

Table 12: Location and storage capacity of currently available EPI vaccine cold *rooms*

OCATION		***QTY***	***GROSS STORAGE CAPACITY***	***REMARKS***
REGION	***VACCINE STORE NAME***			
Central/ National	*1. Urael*	*6**	*240 m3*	*1 Freezer room (45m3)
	2. PFSA (Gulele)	*3*	*856 m3*	
Oromia	*3. Dukem*	*2*	*62 m3*	
	4. Adama	*5*	*155 m3*	
	4. Asebe teferi	*1*	*32 m3*	
	5. Jimma	*2*	*64 m3*	
	6. Nekemt	*1*	*30 m3*	
Amhara	*7. Bahir dar*	*2*	*62 m3*	
	8. Desie	*1*	*32 m3*	
SNNPR	*9. Hawassa*	*2*	*62 m3*	
	10. Bonga	*1*	*31 m3*	
Tigray	*11. Mekele*	*2*	*60 m3*	
Diredawa	*12. Dire dawa*	*1*	*30 m3*	
Afar	*13. Semera*	*1*	*30 m3*	
B/Gumz	*14. Asosa*	*1*	*30 m3*	
Somali	*15. Jijjiga*	*1*	*31 m3*	
	16. Gode	*1*	*30 m3*	
TOTAL		*33*	*1837 m3*	

Regional level

Similarly, the currently available cold chain stores and requirements from 2016-2020 are computed and the analysis shows that the available cold chain at sub national level is adequate to accommodate the future introduction of new vaccines.

Table 13: Current available capacity and future requirements for net positive cold storage at regional level

S/N	REGION	AVAILABLE GROSS STORAGE IN LIT	2016	2017	2018	2019	2020
1	Gambella	2,000	559	581	596	611	626
2	Afar	16,000	2,438	2,501	2,540	2,578	2,617
3	BEN-GUM	16,000	1,122	1,154	1,176	1,199	1,221
4	Dire dawa	16,000	546	561	569	578	586

5	Tigray	32,000	6,946	7,113	7,231	7,348	7,465
6	Somali	32,000	7,203	7,383	7,509	7,636	7,762
7	SNNPR	32,000	24,653	25,338	25,818	26,299	26,779
8	Harari	32,000	297	305	310	315	321
9	Addis Ababa	32,000	4,323	4,402	4,470	4,538	4,606
10	Amhara	48,000	27,023	27,269	27,542	27,815	28,089
11	Oromiya	80,000	45,239	46,536	47,426	48,316	49,206

Health facility level

The assessment of cold chain storage at health facilities from the inventory indicted that 93.1% of the visited HFs have adequate storage capacity, if the Non Functional refrigerators are maintained this percentage increases to 98.7%. Whereas from the visited woredas stores 79.2% of them have adequate storage capacity and this percentage will rise to 90.3% if Non Functional refrigerators are maintained.

Therefore, to introduce other new vaccine (IPV, HPV, etc.) some of HFs and Woreda cold stores required require additional refrigerators. The government is currently procuring more than 4000 Solar Direct Drive and compression refrigerators with different storage capacity to fill the gap and replace obsolete equipment.

2.7.7 Injection Safety and Waste Disposal

A national injection safety assessment was done in 2000. Following the findings of the assessment, injection safety guidelines were developed. Ethiopia shifted from re-usable syringes and needles to auto disable syringes and needles in 2002 for all immunization

activities. The recommended waste disposal method is incineration in all health facilities using incinerators. However burning and burial is used in health facilities. There are guidelines on constructing incinerators at all newly constructed health facilities. The proportion of health facilities with incinerators is unknown.

2.7.8 Vaccine, Supply and Quality

The bulk of vaccine costs for new vaccines and underused vaccines is financed by GAVI, while the cost of traditional vaccines is partly financed by UNICEF. The government is also financing the cost for traditional vaccines (BCG, TT and OPV) and injection materials by mobilizing resources from partners, and in addition the government pays staff salaries. There are no significant problems at national level but weak vaccine stock and inventory management has been noted at regional and service delivery levels. There is a poor distribution system for vaccines and injection materials. This has resulted in overstocking of vaccines at central level while sub national cold rooms were not storing adequate vaccines. Vaccine wastage, particularly that of BCG is high. There is inadequate wastage monitoring at health facility level. The strength of the cold chain to appropriately deliver potent vaccine to children was also challenged by the temperature monitoring study (TMS) in 2011.

In an attempt to address these issues, health facilities in-service training programmes have been conducted to enhance staff capacity in vaccine handling and management with particular focus on the stock management, wastage monitoring, temperatures monitoring, etc. Remote Temperature Monitoring Devices (RMTD) procured to equip all cold rooms with an electronic automatic temperature recorder and an audible alarm system. Also refrigerators at all levels supplied with fridge-tags to allow internal refrigerator temperatures to be monitored and record temperatures outside of the acceptable range. To tackle distribution challenges PFSA expected to start storage and distribution of vaccines and accessories to lower level as early as possible.

2.8 AEFI surveillance and monitoring

To introduce surveillance for Adverse Events Following Immunization (AEFI) into the immunization programme, AEFI guidelines have been developed in 2011. In addition, training on AEFI is being conducted along with Immunization in Practice and new

vaccine introduction trainings in preparation for the introduction. Besides AEFI reporting forms were printed and distributed to all health facilities. Additional training were also given integrated with Men A campaign, Polio and Measles SIAs. AEFI reporting is still very low except following campaigns such as Men A phase II in 2014 where there was improved AEFI reporting. In 2015, the AEFI guideline is on revision considering the new vaccines introduction into the country.

2.9 EPI Advocacy, social mobilization and program communication

Federal MOH has made health structures reform through incorporation of health promotion component in all health program. This will be positively benefiting health communication program for development and dissemination of health education messages using the electronic and print media in Ethiopia context. Regions also have similar units that coordinate all promotion and information dissemination activities in their respective regions. Health facilities provide health education to both in-patients and outpatients. EPI is one of the programmes given priority in all these communication activities.

The MoH and other partners are working to fill the gaps in communication in EPI by updating communication materials to be used for training such as IIP, and producing job aid material to support interpersonal communication and IEC material for behavioural changes. Moreover, the current restructuring of the FMOH has positively benefited the health communication program by integrating health promotion as an element of each program. In a bid to improve health service delivery including immunization, high level advocacy meetings were conducted at regional level in regions with low immunization coverage (Afar, Gambella, Somali and Benshangul Gumuz). During the advocacy visits ICC and taskforces were established at regional and woreda level in those mentioned regions. National ICC members conduct periodic advocacy visits to regions and to other partners.

However, there are still gaps in communication such as lack of integration with HEWs activities to access the grass root level of the community, absence of communication focal person at regional/woreda level, shortage of budget, and no operational

researches conducted to assess the behavioural aspects of EPI service utilization. Thus, all partners agreed to support surveys that will assess the behavioural determinants of EPI service utilization, identify root causes and devise appropriate strategies of communication, such as Community Conversation, to improve demand for EPI service by the beneficiaries.

2.10. Management and Human resources

2.10.1. Programme Management

The government has implemented several reform programmes including the civil services reform and Business Process Re-engineering (BPR). The reforms contributed to establish customer focused institutions, rapidly scale up health services including into hard to reaching communities, enhances quality of care and address equity issues. Considering that leadership and governance as key building blocks of health system strengthening, this policy will pave constrictive ways to build inspiring leadership, effective management and good governance for health that can meaningfully transform the health sector to the level that the country's development reaches middle income economies by 2025.

Despite all efforts, still programs including EPI have critical gaps in relation with leadership, management and governance at all levels. This has strong linkage with challenges in the health workforce management, program implementation, limited capacity to mobilize & absorb funds in addressing the rising consumer expectations.

2.9.1.1 EPI Coordination

The MCH directorate is the overall coordinating body for the EPI activities at national level. It coordinates ICC efforts towards common national goals and targets. It also provides technical and financial support to the regions and ensures updating EPI implementation guideline, standardization of training manuals, job aids and any related supplies. Monitoring, supervision and program reviews are being coordinated through

the directorate. Regional health bureaus also provide similar supports to the lower administration levels and health facilities.

Ethiopia has a strong EPI interagency coordinating committee (ICC) chaired by the State Minister of the FMOH. The members include UN agencies, NGOs, Directorates of FMOH and others Civil Society organizations and others. There are two sub-committees under the ICC, the main and technical ICC The main ICC meets biannually led by H.E State Minister and the technical ICC meets quarterly led by the director of maternal and child health directorate. The ICC is the advisory body to the FMOH and also supports the programme in resource mobilization and advocacy visits to regions and other partners. There is EPI task force under the technical ICC which meets every two weeks. There are also three technical working groups under the EPI task force, each of which also meets every two weeks. The Technical working groups are named as monitoring and evaluation, logistics and communication technical working groups. FMOH, Agencies and partners are represented in all.
National Immunization Technical Advisory Group (NITAG) - this body is supposed to advise the ministry on immunization policy, strategy and technical issues like NVI and AEFI is yet to be established.

2.9.1.2 Health Management Information System (HMIS)

There is a health information unit under the planning and programme department of the FMOH. Under the new HMIS (which operates under the principles of simplification, standardization, and integration of reports), there are revised list of 107 sector wide indicators that have been jointly agreed and endorsed by the Government and Development partners; ten (9%) are EPI related. Reports are expected to come through only one channel that is through the HMIS unit and reporting is quarterly. Through the efforts made so far, the timeliness, completeness and reliability of data have improved and it has been possible to use the data for Woreda-based planning and performance monitoring.

Community Health Information System (CHIS) has been designed to make the health information system and decision making effective at the grass roots level and EPI is

integrated into the CHIS. In EFY 2006, efforts were made to speed up the CHIS implementation in rural Kebeles, increasing the CHIS coverage to 64.5%. Owing to the family centered provision of health service, a family folder has been designed to record health information and housing condition of the family from birth to death since EFY 2003. Two years later, the implementation of the family folder, had reached to 40%.

The major challenges identified in the HMIS include delay in implementation of CHIS in pastoralist and urban areas, inadequate use of data quality assurance mechanisms at district and facility levels, inadequate coordination with stakeholders and partners at region level, gap in establishment and functioning of performance review teams, poor documentation and dissemination of monitoring and evaluation, routine information, surveys, surveillance and operational research findings; and limited practice of experience sharing and scale up of best practices.

2.9.1.3 Supervision, Monitoring and Evaluation

Each level of health administrative level is expected to supervise its immediate lower level periodically; but this regularity has been a challenge due to resource limitation. A guideline and tools for ISS have been finalized as part of the Business Process Reengineering (BPR) for smooth implementation. Government and development partners conduct supportive supervision through surveillance and routine immunization officers assigned to regions.

The immunization programme is monitored monthly. Most health facilities utilize immunization monitoring charts posted at the facility and health offices for ease of monitoring the EPI program. Moreover, the quarter review meetings of the EPI integrated with surveillance, SIAs and PHEM are key EPI program monitoring events and give updates to the EPI actors. These are being conducted at all levels of the health structure jointly with EPI partners.

National EPI coverage surveys are also conducted every three to five years to see the broader status of vaccination for the major priority vaccines. In line with this, post introduction evaluation for new vaccines is conducted timely together with partners.

2.10.2. Human Resources for EPI (HRE)

In conjunction with the reform programs, the health workforce density in Ethiopia has increased from 0.84 to 1.3 per 1000 population between 2008 and 2013 indicating improvement in supply and availability of health workers. However, Ethiopia has major HRE management challenges including shortage, urban/rural and regional disparities, and poor motivation, retention and performance. Human resource management has gaps as a result of lack of modern human resource management.

There is an EPI team within maternal and child heath directorate at the MoH level which has a mix of logistics, communication and M&E components as main focus areas of the EPI. However, EPI specific working team/officer in most of the regions, zones, and Woredas/districts do not exist; most are working with other shared responsibilities. Limited training and capacity gap is felt both at program and service delivery points mainly due to the high attrition and turnover of staff.

The enabling factor for good immunization performance and broad national commitment include local recruitment of, and provision of support to, community health workers among others. Hence, the majority of immunization service is being rendered by the health extension workers recruited from the lowest administrative unit, Kebele. The Health Extension Program (HEP) is an innovative community based program started in 2003 aiming to create a healthy environment and healthy living through the 16 essential health service packages including immunization services.

Health Development Army (HDA) is a new initiative of networking the community to expand best practices at large scale within short period of time and enable the community to produce and sustain their own health through implementation of immunization extension package. As part of the HEP packages, the community HDA has got due emphasis as it helps ensure greater involvement of individuals and communities in moving from supply-driven to demand-driven immunization services.

2.10 Summary of the situation analysis

2.10.1 Achievements

Situational analysis of routine immunization

ROUTINE IMMUNIZATION	SUGGESTED INDICATOR	NATIONAL STATUS			
		2011	2012	2013	2014
Immunization coverage	Official coverage estimates % Penta 3	86	83	82	87
	Official coverage estimates % Measles	81	80	76	84
	Official coverage estimates % BCG	ND	ND	77	81
	Official coverage estimates % Penta1	86	95	91	93
	Most recent survey coverage % Penta3		65.7%	No	No
	Official coverage estimates % **TT2+ PW/PAB**	23	76	79	80
	Percentage fully immunized child	ND	ND	75	80
Immunization demand	Percentage drop-out Penta1 – Penta3	10%	7%	10%	6.5%
	Percentage drop-out Penta1 – Measles	5.8%	15.8%	16.5%	9.7%
Immunization equity	Percentage gap in DTP3 between highest & lowest socio- economic quintiles	ND	ND	ND	ND
	Number and proportion of districts with Penta3 coverage >80%	32%	48%	50.3%	73.2%
	Number of high-risk communities identified for accelerated routine immunization programming	ND	ND	ND	ND
New vaccine introduction	Number of new vaccines introduced into the routine schedule in the last plan period	1	0	1	0
	Pneumococcal Conjugate Vaccine	ND	ND	72	85
	Rotavirus coverage(Rota 2)	NA	NA	ND	73

Table 14: Situational analysis by accelerated disease control initiatives, based on previous years' data (2011-2014)

SYSTEM COMPONENTS	SUGGESTED INDICATORS	NATIONAL			
		2011	2012	2013	2014
Polio	*OPV3 coverage*	86%	83%	82%	87%
	Non polio AFP rate per 100,000 children under 15 yrs. of age	2.0	2.7	2.9	2.9
	Non polio entero virus rate per 100,00 children 15 yrs of age	7.6	4.6	7.9	7.3
	Stool Adequacy Rate	80%	88%	89%	87%
	Extent: NID/SNID No. of rounds *Coverage range*	2 NIDs >95%	8 SNIDS >90%	2NIDs and 5 SNIDs	6 SNIDs & 1 NID; >90%
	Wild polio virus (importation*)	0	0	9	1
MNT	*PAB coverage*	23%	66%	79%	80%
	Number of districts reporting > 1case per 1,000 live births	ND	ND	ND	ND
	Was there an SIA? (Y/N)	Yes	Yes	Yes	Yes
Accelerated Measles Control	*Measles coverage*	81%	80%	75%	80%
	No. of outbreaks reported	196	146	243	302
	No of woredas with outbreaks	143	125	192	249
	No woredas that conducted Measles SIAs	146	0	824	ND
	Extent: NID/SNID *Age group* *Coverage*	SNID Follow up 6-59m 89%	NID Follow up SIAs 6-59m >93%	SNID Follow up 6-59m 88%	0
Epidemic meningitis	Meningococcal A coverage	NA	NA	98.4%	97.6%

Table 15 : Situational analysis of routine EPI by system components based on previous years' data (2011-2014)

SYSTEM COMPONENT	SUGGESTED INDICATOR	NATIONAL STATUS			
		2011	2012	2013	2014
1. PROGRAMME MANAGEMENT					
Law & regulation	What numbers of functions are conducted by the NRA?	1	1	1	1
	Is there legislation or other administrative order establishing a line item for vaccines?	Yes	Yes	Yes	Yes
	Is there legislation identifying the sources of public revenue for immunization financing?	Yes	Yes	Yes	Yes
Policy	Has the national immunization policy been updated in the last five years?	Yes	Yes	No	Yes
Planning	Does the country have an annual work plan for immunization funded through Ministry of Health budgeting processes?	Yes	Yes	Yes	Yes
	What is the number and proportion of districts with an annual micro-plan for immunization?	100%	100%	100%	100%
Coordination	What were the number of ICC (or equivalent) meetings held at which routine immunization was discussed?	5	5	10	5
	What were the number of NITAG (or equivalent) meetings Held last year?				0
Advocacy	How many presentations on immunization performance or Expenditures were made to parliament?	0	0	0	0
2. HUMAN RESOURCES MANAGEMENT					
HR numbers	Number of health workers per 10 000 population	4	4	4	4
	Percentage vaccinator posts currently vacant	0	0	0	0
Capacity-building	Number & proportion of health workers & managers trained in immunization services through MLM or IIP training per year	ND	ND	ND	87 Epi Officers trained for MLM 894 HCW trained for IIP
	Percentage of health workers trained in immunization in the last two years (data from PIE and EPI reviews)			ND	ND

SYSTEM COMPONENT	SUGGESTED INDICATOR	NATIONAL STATUS			
		2011	2012	2013	2014
	Curriculum review for pre-service medical and nursing immunization education conducted	ND	ND	ND	ND
Supervision	Average number of regional supervision visits to each district level /year	2	2	2	2
3. COSTING AND FINANCING					
Financial Sustainability	What percentage of total routine vaccine spending was financed using government funds (including loans & Excluding external public financing)?	6%	6%	8%	11.7
	What proportion of the line item in the national budget for immunization was actually funded?				
	What percentage of immunization resources are being met by the domestic health budget (as identified in the annual budget plan)?				
	Government expenditures on routine immunization per surviving infant (JRF 6700)				33%
	Are sub-national immunization budgets and expenditures Monitored and reported at national level?	Yes	Yes	Yes	Yes
4. VACCINE SUPPLY, QUALITY & LOGISTICS					
Transport / mobility	Percentage of districts with a sufficient number of supervisory/EPI field activity vehicles /motorbikes/bicycles (based on their need) in working condition	ND	ND	ND	ND
Vaccine supply	Was there a stock out of any antigen at national level during the last year?	No	Yes	No	Yes
	If yes, specify duration in months		1 month		2 month
	If yes, specify which antigen(s)		BCG		BCG
Cold-chain/ logistics	Percentage of districts with adequate numbers of appropriate and functional cold-chain equipment	85%	90%	90%	ND
	What was the year of last inventory assessment for all Cold-chain, transport and waste management equipment (or EVM)?			Yes	No
	Number of PHC facilities with >80% score for all indicators on the last EVM assessment	ND	ND	ND	ND
	National consolidated EVMA score%	ND	ND	67%	ND

SYSTEM COMPONENT	SUGGESTED INDICATOR	NATIONAL STATUS			
		2011	2012	2013	2014
	Percentage districts with availability of a cold-chain replacement plan				
Waste disposal	Availability of a waste-management policy and plan	Yes	Yes	Yes	Yes
5. IMMUNIZATION SERVICES (refer also to Table RI and Table ADC)					
Routine coverage	Penta3 coverage	86%	83%	82%	87%
Demand	National DTP1–DTP3 drop-out rate	10%	7%	10%	6.5 %
	Percentage of districts with drop-out rate DTP1–DTP3 >10%	55%	42%	42%	20.5%
Equity	Percentage Penta 1 coverage	86%	95%	91%	93%
	Number of districts >80% coverage	32%	48%	50%	73.2%
	Percentage gap between lowest/highest socio-economic quintile	ND	ND	ND	ND
	Percentage planned outreach visits conducted	ND	ND	ND	ND
	Line list of high-risk districts/communities identified	Yes	Yes	Yes	Yes
	High-risk plan for disadvantaged communities	Yes	Yes	Yes	Yes
New vaccines	Number of new vaccines introduced into routine schedule in the last plan period	1	0	1	0
	Pentavalent coverage	86%	83%	82%	87%
	Pneumococcal Conjugate Vaccine	ND	ND	ND	85%
	Rotavirus coverage(Rota 2)	NA	NA	NA	73%
6. SURVEILLANCE & REPORTING					
Routine surveillance	Percentage of surveillance reports received at national level from districts compared to number of reports expected(completeness)	90%	92%	95%	
	AFP detection rate/100 000 population under 15 years-of age	2.7	2.9	2.9	3.1
	Percentage suspected measles cases for which a laboratory test was conducted	7.3	5.1	6.2	6.0
	Number of neonatal deaths for which a follow-up investigation was conducted	ND	ND	ND	ND

SYSTEM COMPONENT	SUGGESTED INDICATOR	NATIONAL STATUS			
		2011	2012	2013	2014
	Sentinel surveillance for rotavirus established	3	3	3	3
	Sentinel surveillance for meningitis (Hib/PCV) established	3	3	3	3
	Number of suspected meningitis cases tested for Hib/ pneumococcal disease and(%result positive) according to standard protocol	935(1%)	1111(1%)	1083(1%)	936(1%)
Coverage monitoring	Percentage gap in match between DTP3 survey coverage and officially reported figures		17.3%		
Immunization safety	Percentage of districts that have been supplied with adequate (equal or more) numbers of AD syringes for all routine immunizations	100%	100%	100%	100%
Adverse events	National AEFI system is established with a designated national committee	Yes	Yes	Yes	Yes
	Number of serious AEFI cases reported and investigated	ND	ND	ND	ND
7. DEMAND GENERATION AND COMMUNICATION					
Communication strategy	Availability of a routine immunization communication plan	Yes	Yes	Yes	Yes
Research	Year of last study on community knowledge, attitudes and practices in relation to immunization	Yes	No	No	No

2.11 Strengths, weaknesses, opportunities and threats

This sections analyses the strengths, weaknesses, opportunities and threats of the EPI, both internal and external, in order to identify and prioritize its principal challenges using a presentation of the activities to be implemented. The following tables will show the connections between the various issues identified, the target goals and the strategies for implementing activities in this cMYP.

Table 16 : SWOT analysis

EPI COMPONENT	STRENGTHS	WEAKNESSES
1.Service delivery	☞ ***Achievements in immunization against the HSDP IV and MDG targets:*** ✓ MDG 4 before three years ahead of time line ✓ Interruption of circulation of WPV ☞ ***Access is improving particularly to PHC:*** ✓ Health facility expansion particularly to primary health care facilities ☞ ***New initiatives*** New vaccine introduction in the past 5 years include PCV, Rota. ☞ ***Coverage improvement with all available antigens***	☞ ***Missed opportunities*** ✓ Integration of EPI services with other maternal and child hood interventions ☞ ***Inadequacy in Continuum of care:*** ✓ Lack of Availing all services to clients at every encounter ✓ Low effective coverage from birth to 1 year of age ☞ ***Inequity/avoidable inequalities*** ✓ Access limitations to health facilities in developing regional states ✓ Regional disparity in coverage among regions, zones, woreda, urban and rural ☞ ***Suboptimal quality of service*** ✓ Shortage of adequately trained EPI service providers and EPI managers. ✓ Poor utilization of services ✓ Irregularity and service interruption ✓ Weak feedback system
2. Human Resource	☞ ***Improved availability of human resources for health*** ✓ Rapid response for the human resources production ☞ ***Improved in-service training and development*** ✓ New initiatives such as CPD, leadership programs,	☞ ***Inadequate system for retention*** • Inadequate upgrading of HEWs • High Attrition Rate of HWs and absent retention mechanism

EPI COMPONENT	STRENGTHS	WEAKNESSES
		• Inequitable distribution of skilled human resource • Low provider motivation ☞ ***Inadequate mechanisms for improving capacities of immunization program management*** • Weak knowledge management at all levels
3. Program Monitoring/Surveillance and HMIS	☞ ***Improved evidence generation and dissemination*** ☞ Several surveys and assessments are carried out and are being carried out ☞ ***Improved HMIS*** ☞ Improved HMIS implementation in government facilities including in private health facilities ☞ Initiation of CHIS ☞ ***Improved diseases surveillance system/PHEM*** • Establishment of reference laboratories • Ensured legal framework for survey and surveillance ☞ ***Improved program monitoring*** ✓ Integrated Supportive supervision and inspection ✓ Documenting best practices ✓ Monthly reporting of EPI data through e HMIS ✓ Regular and participatory review mechanism ✓ Woreda based micro-planning using EPI data	☞ ***Gap in completeness and timeliness of routine EPI data*** ☞ ***Inadequate triangulation of information*** ☞ ***Weak data verification efforts at each level*** ☞ ***Weak dissemination of research and assessment findings*** ☞ ***Weak AEFI surveillance system*** ☞ ***Weak link between VPD surveillance and EPI***
4. Cold Chain Logistics & Vaccine Quality	☞ ***Improved commodity security*** ☞ ***Expansion of hubs*** ☞ ***Improved cold chain infrastructure*** ☞ ***Improved cold-chain management system*** ☞ ***Improved cold chain monitoring system***	☞ ***Supply chain gap in relation to supply distribution*** ☞ ***Poor capacity of forecasting, quantification procurement and stock management of supplies and commodities particularly at lower level*** ☞ ***Inadequate maintenance capacity (of cold chain equipment)*** ☞ ***Low utilization of technology and innovations***

EPI COMPONENT	STRENGTHS	WEAKNESSES
5. Immunization Financing	☞ ***Increased visibility of immunization resources available through mapping*** ☞ ***Availability of free MNCH including EPI as cost-exempted services*** ☞ ***Improved government financial contribution for immunization***	☞ ***Low visibility of immunization financing at sub-national level*** • Gaps in mobilizing local resource for immunization • Poor resource mapping capacity especially at sub-national level ☞ ***Weak financial utilization and timely disbursement at all levels*** ☞ ***Low multi-sectorial response particularly in development and investment corridors*** ☞ ***Delay in financial disbursement from partners***
6. Advocacy, Communication& Social Mobilization	☞ ***Increased community facing interventions*** • HEP and HDA as a demand creation, improving access and community empowerment tool • Community participation in organized manner particularly the women development army • Engagement of local populations in Health facility management boards and monitoring of health services by community representatives in some areas ☞ ***Increased effort on hard to reach populations as demand creation*** • Increased focused social mobilization efforts in pastoralist areas implementing the MoH social mobilization ignition document.	☞ ***Weak tailored communication strategy for pastoralist and hard to reach communities*** ☞ ***Weak IPC skill from service provider side*** ☞ ***In adequate production of communication materials*** ☞ ***Low utilization of the available communication materials*** ☞ ***Weak utilization of communication channel mix*** ☞ ***Weak advocacy efforts on immunization***
	☞ ***Improved performance follow up*** ☞ ***Improved coordination through technical working groups*** • Use of technical working groups	☞ ***Continuity of achievements such on child health*** ☞ ***Wide variation in the implementation of HDA***

EPI COMPONENT	STRENGTHS	WEAKNESSES
7. Program Management	• Encouraging multi-sectorial collaborative efforts Establishment of partner's forum at subnational level ☞ ***Improved Integrated Supportive Supervision practice*** ☞ ***Establishment and institutionalization of PHEM*** ☞ ***Strengthened regulatory system*** ☞ ***Improved program management:*** ✓ Availability of strategies and guidelines ✓ Efforts for preparation of minimum service standards	☞ ***Inadequate dissemination and alignment of strategies, plans, etc.*** • Shared Vision not optimal especially at lower levels ☞ ***Inadequate follow up of plans/reviews on implementation*** • Inadequate follow-up on implementation of policies, guidelines and plans ☞ ***Weak accountability and good governance challenges*** • Variation in leadership and good governance • Weak implementation capacity among regions ☞ ***Variation in fostering coordination/partnership (inadequate resource mobilization and utilization capacity)*** • Suboptimal public-private partnership • Suboptimal program leadership at sub-national levels ☞ ***Regulatory:*** ✓ Inadequate quality assurance actions Poor capacity to implement the regulatory framework

OPPORTUNITIES	THREATS
☞ *Strong political commitment by the government* ☞ *flagging HEP supported by HDA* ☞ *Improving health care seeking behaviour* ☞ *Sustained national economic development* ☞ *Improving basic infrastructure* ☞ *Improved literacy rate, particularly female education* ☞ *Establishment of Vital Events Registration Agency (VERA)* ☞ *Resettlement of pastoralist communities* ☞ *Health Insurance Schemes* ☞ *Existence of Government structure up to community level* ☞ *Urbanization*	☞ *Suboptimal level of community KAP* ☞ *Geographic inaccessibility of some communities,* ☞ *Low predictability of donor funding* ☞ *Local conflicts* ☞ *Polio importation* ☞

CHAPTER THREE

GOALS, OBJECTIVES, KEY ACTIVITIES, INDICATORS AND MILESTONES NIP 2016-2020

3.1 Introduction

Immunization continues to be one of the most cost-effective of all child survival health interventions. Traditionally, immunization has had children and women as the main foci of attention but recently this is being broadened to include the wider population in line with the current global immunization vision and strategy (GIVS).

This comprehensive Multi-Year Plan (cMYP) of Action covers the fiscal years 2016-2020. The objectives and activities set forth in this Multi-Year Plan provide the framework required to meet beyond previously stated goal of reducing infant and child mortality and morbidity associated with vaccine -preventable diseases (VPD). Further, this Plan addresses new challenges and expands the previous plan by providing guidelines for the introduction of new vaccines.

Ethiopia intends to introduce new vaccines such as measles second dose as Measles rubella, Men A, HPV and Yellow Fever in the coming cMYP (2016-2020).

3.2 Goals of the cMYP

The 2016-2020 cMYP of Ethiopia aims at achieving five major goals which are within the context of the goals of GVAP with strategic components as described below:

Goal 1:	Goal 1: Achieve a country free of poliomyelitis by 2018
Goal 2:	Meet vaccination coverage targets in, district, zone, region, and nationally by 2020
Goal 3:	Exceed the MDG 4 target for reducing child mortality in the country (we can state like 'To reduce under-five mortality from 2013 level of 64/1,000 to 35/1,000, infant mortality rate from 44/1000 to 24/1000 and NMR from 28 to 14/1,000 by 2020")
Goal 4:	Meet National elimination targets e.g. measles, MNT
Goal 5:	Introduce New & Under-utilized Vaccines

3.3 Programme Objectives

Objective 1: Increase and sustain high vaccination coverage.

(a) Reach 90% national coverage and 80% in every district with all vaccines by 2020.
- ☞ Reduce DTP-HepB-Hi1b- DTP-HepB-Hib3 dropout rate to 2% nationally and less than 5% in all districts by 2020
- ☞ Ensure availability of immunization service in all kebeles by 2020
- ☞ Reduce number of unimmunized children by 75% by 2020 from the 2014 baseline

(b) Introduce measles second dose as Measles rubella vaccine by 2017, Men A vaccine and HPV vaccines by 2018, and Yellow Fever vaccine by 2019.

Objective 2: Maintain polio free status and fulfil the recommend standard AFP surveillance at national and regional levels for national certification.

(a) All polioviruses are laboratory-contained and nationally certified polio-free by the end of 2018.
(b) A National polio legacy plan is finalized by the beginning of 2016.

Objective 3: Eliminate measles and advocate for the elimination of rubella and congenital rubella syndrome.

(a) Achieve an incidence of less than one confirmed measles case per million populations by 2020.
(b) Attain MCV1 coverage ≥95% at national and district levels and at least 95% SIAs coverage in all districts.

Objective 4: Attain and maintain elimination/control of other vaccine-preventable diseases.

(a) To maintain the current MNT elimination status by 2016 and beyond
(b) Achieve 90% PAB coverage nationally by 2016 and every districts by 2020

Objective 5: To expand cold storage capacity in line with introduction of new vaccines, population growth and coverage expansion plan and campaigns at all levels by 2016

Objective 6: improve knowledge and practice Health workers on EPI

(a) Vaccine management among health workers from current score of 61% to 80% as measured by VMA by 2020
(b) To reduce care takers knowledge gap on EPI program and VPD from 45% to 22% by 2020
(c) Achieve in 80% of districts MLM capacity built on evidence based planning and program management on M&E by 2017

Objective 7: Strengthen program Monitoring and Evaluation

(a) Through programmatic reviews and EPI performance monitoring system in all districts using HMIS captured data by 2017.
(b) Achieve 90% timeliness, accuracy rate and completeness of HMIS reports at all levels by 2017

Objective 8: increase government fund allocation to 10% for traditional vaccines procurement and new vaccine co financing by 2020

3.4 Strategic Areas/Approaches

The 2016-2020 Comprehensive EPI Plan shall be implemented within the framework of Global Immunization Vision and Strategies thus the **Key approaches for implementation are;**

1. Implementation of all components of the **Reach Every District (RED)/ Reach Every Child/Community (REC)** approach and other locally-tailored approaches will be promoted to maximize the accessibility and utilization of immunization services. This will ensure greater involvement of individuals and communities in moving from supply-driven to demand-driven immunization services.

2. Introduction of new vaccine which includes HPV , Men A, yellow fever rubella with second dose of measles

3. Strengthening of the ICC – which are the main ICC and the technical ICC demonstrated by regular meeting with documented minutes as stipulated in the TOR of ICC

4. **Extending the benefits of new vaccines to all.** It is assumed that the country will be supported to introduce new vaccines and to intensify advocacy for reduction of its prices. Efforts will be made to improve vaccine procurement, supply and management systems while ensuring accessibility and affordability to the population in order to achieve universal coverage. Advocacy for developing local capacity for vaccine manufacture within the country will be part of the efforts.

5. **Sustainable immunization financing** will be pursued and domestic resources provided. Efforts to establish national budget lines and allocate and disburse funds for immunization will be continued in an increasing manner. The need for additional resources to reach the unvaccinated children and to increase immunization coverage to at least 90% will get strong emphasis.

6. **Integrating immunization** with other health interventions in the HSTP I, with immunization interventions quantified coasted and incorporated into the document. Integration of additional child survival interventions with immunization should be pursued to leverage the potential for prevention of pneumonia and diarrhea. Immunization will also be included as a priority intervention during humanitarian emergencies to save lives and reduce morbidity, disability and mortality due to vaccine-preventable diseases.

7. **Enhancing partnership for immunization.** Partnership for immunization will be expanded within the country, and with Continental and international initiatives such as Harmonization for Health in Africa (HHA). Continued use of the platform of the Interagency Coordination Committees and other national and subnational/regional

coordinating mechanisms to strengthen local partnerships and forge new ones will be strengthened.

8.**Improve monitoring and data quality**. The quality of immunization and surveillance data will be regularly monitored and its use at each level promoted. Information generated from HMIS and surveys will be used for advocacy and for programme and service improvement. Sensitive and high-quality surveillance including laboratory confirmation, linked to the Integrated Disease Surveillance and Response platform, should be used to monitor the epidemiological trend of vaccine-preventable diseases and guide implementation of immunization strategies.

9.**Improving human and institutional capacities**. Individual and institutional capacity to adequately plan, implement and monitor immunization programmes will be strengthened through training. The capacity to plan and manage immunization services at district and operational levels will be prioritized with a view to improving and sustaining high vaccination coverage rates.

10.Development and implementation of integrated communication plan for routine immunization , supplementary immunization and surveillance

11.Advocacy with decision makers

12.Improving vaccine supply, safety and regulation. Vaccine safety monitoring systems should be enhanced by strengthening the capacity of FMHACA through the implementation of institutional development plans. The promotion of safe injection policies and practices and improved

13.Strengthening Integrated disease surveillance and response supported by laboratory

3.5 Anticipated Coverage Targets

Table 17: Baseline and coverage targets 2016 to 2020

INDICATORS	BASE YEAR	TARGETS					
	2014	2015	2016	2017	2018	2019	2020
Total Population	89,714,313	92,046,885	94,440,104	96,895,547	99,414,831	101,999,617	104,651,607
Births (3.36%)	3,014,401	3,092,775	3,173,187	3,255,690	3,340,338	3,427,187	3,516,294
Infants' deaths (44/1000 in 2013)	120,576	111,340	106,619	101578	96,202	90,478	84,391
Surviving infants (3.16%)	2,834,972	2,908,682	2,984,307	3,061,899	3,141,509	3,223,188	3,306,991
12-23 months old (2.5%)	2,242,858	2,301,172	2,361,003	2,422,389	2,485,371	2,549,990	2,616,290
9-13 old female pop (7%)	6,280,002	6,443,282	6,610,807	6,782,688	6,959,038	7,139,973	7,325,612
Pregnant women (3.36%)	3,014,401	3,092,775	3,173,187	3,255,690	3,340,338	3,427,187	3,516,294
Target population vaccinated with BCG	2,441,665	2,628,859	2,855,869	3,027,792	3,173,321	3,290,100	3,410,805
BCG coverage	81%	85%	90%	93%	95%	96%	97%
Target population vaccinated with OPV3	2,579,825	2,675,987	2,775,406	2,878,185	2,984,433	3,094,260	NA
OPV3 coverage	91%	92%	93%	94%	95%	96%	NA
IPV	NA	2,675,987	2,775,406	2,878,185	2,984,433	3,094,260	3,207,781
IPV	NA	70%	93%	94%	95%	96%	97%
Target population vaccinated with pentavalent	2,466,426	2,617,813	2,745,563	2,847,566	2,953,018	3,094,260	3,207,781

INDICATORS	BASE YEAR	TARGETS					
	2014	2015	2016	2017	2018	2019	2020
(Penta 3)							
Penta 3 coverage	87%	90%	92%	93%	94%	96%	97%
Target population vaccinated with pentavalent (Penta 1)	2,636,524	2,734,161	2,835,092	2,939,423	3,047,263	3,158,724	3,273,921
Penta 1 coverage*	93%	94%	95%	96%	97%	98%	99%
Target population vaccinated with **3rd dose** of **PCV 10**	2,409,726	2,675,987	2,775,406	2,878,185	2,984,433	3,094,260	3,207,781
3rd dose PCV 10 Coverage	85%	92%	93%	94%	95%	96%	97%
Target population vaccinated with **1st dose** of **PCV 10**	2,608,175	2,460,745	2,608,285	2,733,664	2,864,428	3,032,375	3,175,703
1st dose PCV 10 Coverage	92%	94%	95%	96%	97%	98%	99%
Wastage rate in base-year and planned thereafter	6.50%	6.30%	6.20%	5.10%	4.00%	3.50%	3.00%
Wastage factor in base-year and planned thereafter	1.05	1.05	1.05	1.05	1.05	1.05	1.05
Target pop vaccinated with 2nd dose of Rota vaccine	2,664,874	2,617,813	2,745,563	2,878,185	2,984,433	3,094,260	3,207,781
2nd dose of Rota vaccine Coverage	73%	90%	92%	94%	95%	96%	97%
Target pop vaccinated with 1st dose of Rota vaccine	2,353,027	2,734,161	2,835,092	2,939,423	3,047,263	3,158,724	3,273,921
1st dose of Rota vaccine Coverage	83%	94%	95%	96%	97%	98%	99%
Target population vaccinated with **1st dose** of Measles	2,267,978	2,472,379	2,685,877	2,816,947	2,953,018	3,062,029	3,174,711

INDICATORS	BASE YEAR	TARGETS					
	2014	2015	2016	2017	2018	2019	2020
MCV1 Coverae-MR1 by2018	80%	85%	90%	92%	94%	95%	96%
Target population vaccinated with **2nd dose** of Measles	0	0	0	1,454,341	2,536,661	2,755,709	2,953,018
MCV2 Coverage-MR(2017)	0	0	0	80 %	85%	90%	94%
Pregnant women vaccinated with TT+ (PAB)/Td	2,411,521	2,628,859	2,855,869	3,027,792	3,173,321	3,290,100	3,410,805
TT+ coverage (PAB)/Td	80%	85%	90%	93%	95%	96%	97%
Annual Penta Dropout rate	6%	4%	3%	3%	3%	2%	2%
Annual Measles Dropout rate	14%	10%	5%	4%	3%	3%	3%
Men A	0	0	0	0	1,586,661	2,632,080	3,103,833
Men A Coverage	0	0	0	0	80%	95%	96%
Yellow Fever	0	0	0	0	0	2,467,575	3,103,833
Yellow Fever Coverage	0	0	0	0	0	75%	91%
HPV Performance	0	0	0	0	3729140	4169856	4630278
HPV Coverage (%)	0	0	0	0	80%	85%	90%

Table 18: National problems, priority, objectives and milestones, AFRO regional and global goals

NATIONAL PRIORITIES	NIP OBJECTIVES	NIP MILESTONES	AFRO REGIONAL GOALS	ORDER OF PRIORITY
Routine Coverage ▪ 50% of districts achieved DTP3/OPV3 coverage < 80% and nationally penta3 is 82%	To achieve 97% Nationally and 80% DTP-HepB-Hib3/OPV3 coverage in all districts by 2020	**80% DTP-HepB-Hib3 coverage:** By 2018: achieve 97% coverage nationally and 90% of districts at least 89% DTP-HepB-Hib3 coverage **<=80% DTP-HepB-Hib3 coverage:** 2016: 15% of districts achieve DTP-HepB-Hib3 < 50% 2017: 10% of districts achieve DTP-HepB-Hib3<60% 2018: 5% of districts achieve DTP-HepB-Hib3<70%	By 2013 reach routine immunization coverage of 90% nationally with at least 80% coverage in every district.	**1**
Low coverage in hard to reach areas	No district less than 80% by 2020	2019: 3% districts achieve DTP-HepB-Hib3<80% 2020: 0% districts achieve DTP-HepB-Hib3<90%		**1**
High dropout rate in 42% of districts penta3 with 8% national penta dropout rate	Reduce penta1 to penta3 dropout rate to 1% by 2020 at national level	By 2018:3% or less penta dropout rate nationally than 5% in all districts		**3**
Polio	Maintain polio free status	By 2018: documentation of polio free status will be	.	**2**

NATIONAL PRIORITIES	NIP OBJECTIVES	NIP MILESTONES	AFRO REGIONAL GOALS	ORDER OF PRIORITY
Risk of importation	and fulfil the recommend standard AFP surveillance at national and regional levels for national certification	done and achieve 95 % OPV3 coverage nationally		
Measles Low measles coverage Measles outbreak in many parts of the country	Achieve measles elimination status by 2020 -measles incidence < 1 cases per million population - achieve >95% SIAs coverage in all districts - Non-measles febrile rash illness rate ≥ 2.0 /100,000 population per year ≥ 80% of districts investigating ≥ 1 suspected measles case with blood specimens per year.	by 2018: routine measles coverage will be 94% surveillance standard indicators will be maintained incidence of measles will decrease to < 5 cases per million population		**2**
MNT **Elimination status not achieved**	Reach MNT elimination by 2016 and maintain MNT elimination status by 2016 and beyond	By 2018: Achieve 95% PAB coverage		**3**
Measles second dose and Rubella vaccine is not yet introduced into routine EPI	Introduction of measles second dose and Rubella vaccine by 2017	By 2018: PIE of MR done coverage at lease 94 %		**1**
Men A is not yet introduced into routine	Introduction of new Men A vaccine by 2018	By 2018: Men A vaccine is introduced and reach coverage of 80%		**2**

NATIONAL PRIORITIES	NIP OBJECTIVES	NIP MILESTONES	AFRO REGIONAL GOALS	ORDER OF PRIORITY
EPI				
HPV vaccine not yet introduced	Introduction new HPV vaccine by 2018	By 2018: HPV vaccine introduced and attain a coverage of 80%		**2**
Yellow Fever not introduced in high risk areas of Ethiopia	Introduction Yellow Fever vaccine in high risk areas by 2019	2019: Yellow Fever vaccine introduced (75%)		**2**
Immunization Safety and waste management No assessment done on injection safety and waste management **- involvement of NRA in AEFI surveillance not adequate**	Ensure injection safety and waste management in all health facilities by 2020 and institutionalizeAEFI surveillance at HF level by 2020	2016: conduct immunization safety and waste management assessment Prepare and distribute AEFI guidelines Conduct TOT on AEFI surveillance By 2018-well established AEFI surveillance system will be in place	By the end of 2008, all immunization injections are administered safely.	**3**
Surveillance weak data quality and use: weak completeness, timeliness and accuracy of data and information use Weakness in NNT surveillance system	Achieve 100% timeliness, accuracy and completeness of reports by 2020 Achieve NNT surveillance standard indicators in all regions by 2015	By 2018: 90% timeliness and completeness of reports will be achieved and maintained , NNT community based surveillance will be improved		**3**
Vaccine Supply weak vaccine stock	Computerized vaccine stock management in all districts	2018: direct vaccine delivery to districts instituted by PFSA		**2**

NATIONAL PRIORITIES	NIP OBJECTIVES	NIP MILESTONES	AFRO REGIONAL GOALS	ORDER OF PRIORITY
management and distribution system	and direct delivery of vaccines to HFs by 2020			
Cold Chain / Logistics Inadequate capacity at central level and weak cold chain maintenance at lower level No Freeze monitoring at all levels zone, woreda and cluster HC storage space(with new vaccine introduction) could be bottle neck	Expand the central cold room net storage capacity to a net volume of 2000 m3 by 2020 and trained one mid-level cold chain technician in each district by 2017.	PFS By 2018: 800 mid level cold chain technician trained Regional hubs in place , transition completed ,80 high level trained cold room technicians , additional cold rooms at the centre additional refrigerators for zone, woreda and cluster HFs procured		**2**
Communication /Advocacy, Social Mobilization and Program Communications Inadequate sub-national level capacity on immunization communication Low level of commitment or support of political and decision makers as well as important stakeholders in immunization at all	To build the capacity of Sub-national level in the planning, implementation and monitoring and evaluation of communication activities by 2017. To increase the involvement of political and decision makers as well as important stakeholders in immunization program at all level by 2018 To improve the participation of HDAs &	2018:- Trained communication focal person at regional level and/or EPI focal person at all level on communication to improve their capacity in the planning and coordination of communication activities. Serie of advocacy visits done 2016-2018:-Conduct a series of advocacy visits and workshops to ensure the commitment and support of political leaders, heads of sector offices and important community leaders to immunization program 2016:- Establish and /or revitalizing the HDAs & Social Mobilization committees 2016-2020: Disseminate immunization messages to the grass root communities		**3**

NATIONAL PRIORITIES	NIP OBJECTIVES	NIP MILESTONES	AFRO REGIONAL GOALS	ORDER OF PRIORITY
level Poor social mobilization activities at grass root level Inadequate IPC skills among health workers. Lack of awareness of the community on importance of immunization, Shortage of job aids and other IEC materials to facilitate awareness creation process Weak involvement of media in immunization messages dissemination. Lack of communication research and assessment on immunization	Social Mobilization committees by 2016/17 To improve the IPC skills of trained health workers per health facility on interpersonal communication skills by 2017 To increase awareness of the community on immunization to 95% by 2020 To standardize Immunization messages. To produce and distribute IEC materials by 2020 .To strengthen relationship, capacity and involvement of media in immunization program by 2016/17 To conduct regular monitoring of communication activities by 2018-2020 To produce research based	through HDAs and social mobilization committees 2016/17 Train at least one health worker per health facility on interpersonal communication skills in all public health facilities and increase IPC 2016-2020: Production and distribution of IEC materials in five languages 2016/17:- Strengthen relationship and improve capacity of media to give coverage to immunization activities/events and disseminate messages to the community 2016-2020:- Disseminate immunization messages in five languages through national and local radio and TV 2016-2020:-Conduct regular monitoring of communication activities at all levels 2016 -2020:- undertake assessment and research to get inputs for communication activities and evaluate results and achievements		

NATIONAL PRIORITIES	NIP OBJECTIVES	NIP MILESTONES	AFRO REGIONAL GOALS	ORDER OF PRIORITY
	communication messages and materials by 2017/18 To conduct formative research and Immunization communication assessment and survey by 2017			
Management and Planning Inadequate financial allocation for EPI by federal and regional governments	to increase government fund allocation to 10% for traditional vaccine and procurement and new vaccine co finance by 2020	2018: procure 100% of BCG, and TT, and co-finance MR, Rota and Penta vaccines; and government spending on EPI 9% , budget line for vaccine procurement will be continued		**4**
- -weak leadership and management capacity at district level.				**4**
	Achieve in 100% of districts built ML capacity on evidence based planning and program management on M&E by 2020	2018: 100% of districts trained ML managers		

3.6 Planning by immunization system component

Table 19: Service delivery

NATIONAL OBJECTIVE	STRATEGY	KEY ACTIVITIES
• To achieve 80% Penta3 coverage in all districts by 2020 • Ensure accessibility of immunization service in all kebeles by 20120 • Reduce Penta dropout rate to less than 3% by 2020	• RED approach implementation in every district and kebeles • Plan to reach all kebeles at least four times per year in difficult to reach areas and areas with large number of unvaccinated children using health extension workers. • Capacity building for EPI managers and health workers • Design local strategy and implement for pastoralist areas. • Regular supportive supervision and program monitoring • Intensify defaulter tracing mechanism using community based structures. • Learn from experience • incorporation of immunization in the emergency preparedness and response plans	Conduct micro planning workshops in all districts with the involvement of community leaders.
		Implement enhanced routine immunization in emerging regions and zones with large number of unimmunized children
		Train health workers and EPI managers on MLM, IIP , and IRT
		Organize and deploy mobile health teams for pastoralist and other hard to reach populations
		Conduct defaulter tracing using HEWs
		.
		Provide continued orientation and training on EPI to case teams (according to new BPR) to strengthen immunization program
		Register target groups house to house using HEW?P and vaccinate
		Incorporate immunization services in emergency preparedness plans and activities
		Conduct post PCV AEFI assessment
		Provide immunization services in populations affected by complex emergencies
Introduction of IPV, by 2016, Measles and Rubella, HPV by 2017, Men A 2018 and Yellow	• leadership strengthening for new vaccine introduction • Capacity building on new vaccine introduction	apply for MR, HPV, Mena A and Yellow Fever vaccine introduction plan
		Strengthen new vaccine introduction taskforce

Fever vaccine by 2019	at all levels • Advocacy and consensus building • Expansion of Cold chain Storage space • Evaluate vaccine management practices • Revision of monitoring tools	Introduce IPV, by 2016, Measles and Rubella, HPV by 2017, Men A 2018 and Yellow Fever vaccine by 2019 Expand PFSA cold rooms by installing additional cooling units and other facilities , and construction and installation of new cold rooms Train EPI managers and health workers from each HF on new vaccines Evaluate programmatic impact of new pneumococcal and rota virus vaccines introduction
• Achieve, document and maintain polio free status by 2020 • Achieve measles pre-elimination status by 2020 • Reach MNT elimination by 2016 and maintain MNT elimination status by 2016 • Achieve 90% PAB coverage by 2016	• Utilize surveillance data to implement appropriate activities • Improve routine immunization coverage • Conduct SIAs to enhance protection from targeted diseases School based TT immunization Shift to bOPV from tOPV	• Conduct polio campaigns in high risk areas synchronized with neighbouring countries • Conduct national measles SIAs in 2017 and 2019 • Implement routine school TT immunization in all secondary school and above

Table 20: Advocacy, social mobilization and program communications.

NATIONAL OBJECTIVE	STRATEGY	KEY ACTIVITIES
• To improve knowledge of care takers to demand for immunization 2020	• Develop a communication plan • Implement the planned communication • Improve health workers' interpersonal communication capacity • Promote partnership on immunization • Monitor impacts of communication • High level advocacy meetings in poor performing regions • Strengthen regional ICC through advocacy visits/ supportive supervision	Prepare and distribute communication guideline on EPI to all HEWs
		Conduct national community based behavioural determinant survey on immunization service. Conduct regular monitoring of communication activities at all levels
		Train of HWs/HSEWs on IIP including interpersonal communication
		Conduct advocacy and consensus building meeting with regions and stakeholders including funding vaccines
		Conduct caretakers KAP assessment on EPI
		Conduct community conversation on EPI in each kebele regularly
		Identify partners and encourage to contribute to EPI program
		Develop and transmit messages through different medias on immunization Develop and distribute IEC/BCC materials

Table 21: Surveillance

NATIONAL OBJECTIVE	STRATEGY	KEY ACTIVITIES
• To achieve AFP surveillance standards that qualify for polio free certification by 2020 • To achieve measles surveillance standards for pre-elimination status by 2020 • To strengthen NNT surveillance system at all levels by 2020 • Strengthen community surveillance for VPD by 2020 • Establish pneumococcal disease surveillance system by 2020	• Conduct Vaccine preventable diseases surveillance under the umbrella of integrated disease surveillance (AFP, measles and NNT) • Strengthen the laboratory to adequately support vaccine preventable disease surveillance • Implement activities for polio virus containment • Active surveillance in high risk districts • Strengthen Surveillance deploying National and international and local STOP • Initiate community surveillance system • Partnership with CSO working in community surveillance of VPD • Build sero-typing and disease burden study capacity at national level • Build the capacity to conduct AEFI surveillance	Conduct active surveillance for AFP, measles and MNT in all districts
		Build national capacity for VPD sero-typing and surveillance
		Strengthen cross country and cross regional surveillance
		Provide in-service and pre-service training of HW/HEWs on EPI diseases and AEFI surveillance
		Establish a data base , conduct regular analysis and monitoring of surveillance activities at all levels
		Improve timeliness and completeness of reporting of surveillance data and feedback Update the reporting tools to include new diseases or conditions under surveillance and train health workers on the new tool and guides
		Document of polio free certification
		Support the polio and measles labs to maintain accreditation level support the expansion of measles surveillance Provide sufficient reagents
		Deploy international, national and local (in Gambella and Somali) STOP teams for active search
		Include VPDs in integrated surveillance and monitoring systems set up in complex emergencies
		Train HEW on VPD surveillance to promote community based system
		Establish a surveillance system for estimating burden of disease and sero-typing for pneumococcal disease
		Involve CSO and other NGOs in community based VPD surveillance

Table 22: Vaccine supply, quality and logistics

NATIONAL OBJECTIVE	STRATEGY	KEY ACTIVITIES
❖ To establish effective vaccine management system in all districts by 2020 ❖ To expand cold storage capacity in line with introduction of new vaccines, population growth and coverage expansion plan at all levels by 2020 ❖ To establish vaccine quality control system at national level by 2020 ❖ To maintain cold storage capacity at all levels by 2020 ❖ To directly deliver vaccine and EPI logistics to each HFs by 2020 by PFSA	❖ Establish national vaccine quality control and AEFI surveillance committee ❖ Capacity building of health workers on AEFI monitoring ❖ Establish cluster of incinerators and waste management system ❖ Monitor Vaccine demand linking with supply ❖ Build the capacity of health workers on vaccine, cold chain and EPI logistics management ❖ Design follow up mechanism for tracking EPI supplies ❖ Ensure regular availability of sufficient vaccine cold chain spare parts ❖ Strengthening the Capacity of the national regulatory authority (DACA) ❖ Construct distribution hubs in appropriate selected sites which will be within reasonable distance to HFs ❖ Strengthen the PFSA's human resource capacity for vaccine, cold chain and logistics management:	Train district managers and health workers on AEFI Select and purchase equipment to replace 10% of C.C each year Purchase cold chain spare parts and tools Purchase and distribute to all levels vaccine temperature monitoring tools Train HWs and technicians on cold chain maintenance Burning and burial of injection materials in health facilities without incinerator Develop a guide line on storage, distribution and administration of vaccines to be used at all levels Establish vaccine stock recording, monitoring and reporting system in all districts Establish wastage monitoring and control system and conduct vaccine inventory regularly Establish effective vaccine delivery system in all districts Construction of incinerators in all new health facilities Monitor stock management in every district using the data base Establish national vaccine quality control committee Upgrade existing PFSA hubs to be used for routine vaccine storage Conduct training on vaccine management and preventive maintenance for regional cold room managers Conduct planned preventive and corrective maintenance at all levels Train on cold room maintenance, vaccine and logistics management for PFSA staff Procure vaccines based on annual vaccine forecast from prequalified suppliers Conduct accurate demand forecasting activities Procure cold boxes

	❖ Strengthen transportation capacity of PFSA	Prepare quarterly target based accurate forecasting of national vaccine requirement
		Encourage local and district level contribution to health services and immunization program

Table 23: Program management/Health system

NATIONAL OBJECTIVE	STRATEGY	KEY ACTIVITIES
Establish the NITAG EPI management improved at all level Integration of EPI with other intervention <u>Monitoring and evaluation:</u> • Review of EPI policy • Strengthen program ME through programmatic reviews and EPI performance monitoring system in all districts using HMIS captured data by 2020 • Achieve 90% timeliness, accuracy and completeness of reports by 2020	• Advocate on the use and for establishment of NITAG • Train officer leaders and focal persons EPI management • Improve data quality and monitoring system • Strengthen immunization program within health sector reform(BPR) • Regular supportive supervision and program monitoring • periodic assessment of immunization service delivery • Conduct DQS assessment integrated with supportive supervision regularly • Capability building on computerized	Support the meetings of the NITAG Revise the supervisory tools Conduct supervision using the tools Training HW at all level on the EPI policy Identify and intervention to be integrated and integrate activities Establish national database of district indicators
		Train district health management team using the tool
		Training EPI managers and HWs on DQS use
		Conduct review meeting quarterly at district and regional level and annually at national level
		Conduct supportive supervision at all levels quarterly
		Conduct evidence based experience sharing and operational research
		Monitor and evaluate efficiency , effectiveness and impact of combined interventions
		Train district health management team with focus on EPI program implementation
		Conduct national EPI coverage survey
		Conduct supportive supervision quarterly at all levels to motivate and improve health workers capacity
		Conduct review meeting quarterly at district and regional level and annually at national level

	data monitoring for EPI	
Human resource **Adequate and qualified health force for immunization** • Achieve in 80% of districts ML capacity built on evidence bsed planning and program management on M&E by 2020	• Assigning EPI focal person at all level • Use Integrated District Health Management Training Tool (IDHMT) to improve the capacity of district health team. • Training health facility focal person on immunization in practice Improve staff retention and motivation	Integration of EPI training in the preserve EPI curricula Conducting training needs assessment Conduct MLM and IIP training Conduct regular supportive supervision Research for health worker retention and motivation mechanism Implement the realistic retention and motivation mechanisms Orient new staff on immunization Provide data quality self-assessment and database management training to all districts
Financing: • To increase government fund allocation to 10% for traditional vaccines procurement and new vaccine co financing by 2020	• Advocacy though ICC for increased government financing for vaccine and device procurement • Advocate for government cabinet to increase local budget allocation	Organize and conduct advocacy workshops on Immunization financing Submit the annual financial request for the Ministry of Health and Finance and Economic Development to secure financing Conduct resource mobilization from partners Look and design immunization financing sustainability mechanism

Table 24: **Activity timeline**

KEY ACTIVITIES	2016	2017	2018	2019	2020
SERVICE DELIVERY AND PROGRAMME MANAGEMENT					
Conduct micro planning workshops in all districts with the involvement of community leaders annually.	X	X	X	X	X
Implement enhanced routine immunization in emerging regions and zones with large number of unimmunized children	X	X	X	X	X
Conduct MLM, IIP, IRT and cold chain maintenance trainings/refresher for health workers and EPI managers.	X	X	X	X	X
Provide supportive supervision to Motivate and improve health workers capacity	X	X	X	X	X
Organize and deploy mobile health teams for pastoralist areas ??	X	X	X	X	X
Conduct defaulter tracing using HAD and vaccinate all defaulters	X	X	X	X	X
Conduct national EPI coverage survey in 2016 and 2018	X				X
Establish national district based performance monitoring indicator	X	X			
Conduct supportive supervision quarterly at all levels	X	X	X	X	X
Conduct review meetings quarterly at district and regional level and annually at national level	X	X	X	X	X
Monitor and evaluate the efficiency, effectiveness and impact of combined interventions		X	X	X	X
Implement routine school Td immunization in all primary school and above	X	X	X	X	X
Provide data quality self-assessment and database management training to all districts		X	X	X	X
Conduct evidence based experience sharing and Operational research		X		X	
Orient and train EPI teams on immunization program	X	X	X	X	X
Register target groups house to house using HEP and vaccinate	X	X	X	X	X
Incorporate immunization services in emergency preparedness plans and activities		X	X		
Provide immunization services in populations affected by complex emergencies	X	X	X	X	X
Establish a surveillance system for estimating burden of disease and sero-typing	X				
Introduce IPV l vaccine in routine EPI program by 2016	X				
Introduce Men A into routine EPI program by 2018			X		
Introduce HPV and MR vaccines in routine EPI program by 2017		X			
Introduce Yellow fever vaccine in to routine immunization program by 2019				X	

KEY ACTIVITIES	2016	2017	2018	2019	2020
Build cold store and install cold rooms	X	X			
Train EPI managers and health workers from each HF on new vaccines	X	X			
Evaluation of new vaccine introduction		X			

ADVOCACY AND COMMUNICATIONS	2016	2017	2018	2019	2020
Assign one EPI Communication focal person or Technical assistant at regional level to properly plan and coordinate communication activities	x				
Establish or revitalize communication working group at regional level and lead the communication activities	x				
Prepare , distribute communication guideline	x				
Train communication focal person at regional level and/or EPI focal person at all level on communication to and improve their capacity in the planning and coordination of communication activities	x	x	X	X	X
Train at least one health worker per health facility on interpersonal communication skills in all public health facilities and increase IPC	x	x	X	X	X
Conduct a series of high level advocacy visits and workshops to ensure the commitment and support of political leaders, heads of sector offices and important community leaders to immunization program by	x	x	x	X	X
Establish and /or revitalizing the HDAs & Social Mobilization committees	x	X	X		
Dissemination of immunization messages to the grass root communities through HDAs and social mobilization committees	x	x	x	x	x
Standardize Immunization messages and IEC materials based on different communication studies and assessment	x				
Disseminate immunization messages in five languages through national and local radio and TV	x	x	x	x	x
Conduct immunization message standardization workshop and print and distribute standardized messages to health workers at all level	x	X	X	X	X
Production and distribution of IEC materials in five languages	x	x	x	x	x

Strengthen relationship and improve capacity of media to give coverage to immunization activities/events and disseminate messages to the community	x	x	X	X	X
Conduct regular monitoring of communication activities at all levels	x	x	x	x	x
Undertake assessment and research to get inputs for communication activities and evaluate results and achievements	x		x		x

SURVEILLANCE	2016	2017	2018	2019	2020
Conduct active surveillance for AFP, measles and MNT in all districts	X	X	X	X	X
Build national capacity for pneumo and rota virus sero-typing and ensure establishment of their surveillance system	X	X	X		
Conduct and strengthen cross country and cross regional VPD surveillance	X	X	X	X	X
Conduct in-service and pre-service training of HW/HEWs on EPI diseases surveillance	X	X	X	X	X
Conduct regular monitoring of surveillance activities at all levels	X	X	X	X	X
Document polio free certification			X		
Maintain polio certification level surveillance	X	x	x	x	x
Support the polio and measles labs to maintain accreditation level	X	X	X	X	X
Deploy international, national and regional STOP for active search	X	X	X	X	X
Include VPDs in integrated surveillance and monitoring systems set up in complex emergencies	X	X	X	X	X
Involve CSO and other NGOs in community based VPD surveillance	X	X	X	X	X
Institutionalize AEFI surveillance		X	X	X	X
Conduct biannual risk assessment on VPD	X	X	X	X	X
Assure the training, equipment , reagents and quality control procedures of polio/measles laboratories	X	X	X	X	X

VACCINE SUPPLY, QUALITY AND LOGISTICS	2016	2017	2018	2019	2020
Select and purchase equipment to replace 10% of C.C each year	X	X	X	X	X
Purchase cold chain spare parts and tools	X	X	X	X	X
Train HWs and technicians on cold chain maintenance	X	X	X	X	X
Promote Burning and burial of injection materials in health facilities without incinerator	X	X	X	X	X
Construct incinerators with all new health facilities	X	X	X	X	X
Monitor vaccine stocks in every district using the SMT/data base	X	X	X	X	X
Establish national vaccine quality control committee		X			
Upgrade existing PFSA hubs to be used for routine vaccine storage and distribution	X	X	X		
Conduct training on vaccine management and CC preventive maintenance for cold room managers for regional cold room	X		X		X
Train on cold room maintenance, vaccine and logistics management for PFSA staff	X		X		X
Procure vaccines based on annual vaccine forecast from pre-qualified suppliers	X	X	X	X	X
Conduct accurate demand forecasting activities	X	X	X	X	X
Upgrade transportation and communication capacity and improve its management system	X	X	X		
Encourage local and district level contribution to health services and immunization program	X	X	X	X	X
Coordinate immunization resource mobilization through the ICCs	X	X	X	X	X
Procure 5 cold trucks for PFSA vaccine transportation	X		X		X
Procure cold boxes	X		X		X
Prepare quarterly target based accurate national vaccine requirement forecasting	X	X	x	x	x

PROGRAM MANAGEMENT/ HEALTH SYSTEM	2016	2017	2018	2019	2020
Establish national database on district EPI performance indicators	X	X			
Train district health management team using the DHMT tool	X	X	X		
Training EPI managers and HWs on DQS use	X	X	X	X	X
Conduct programme performance review meeting quarterly at district and regional level and annually at national level	X	X	X	X	X
Conduct supportive supervision at all levels quarterly	X	X	X	X	X
Conduct evidence based experience sharing	X	X	X	X	X
Monitor and evaluate efficiency , effectiveness and impact of combined interventions	X	X	X	X	X
Train district health management team with focus on EPI program implementation	X	X	X	X	X
Organize and conduct advocacy workshops on Immunization financing	X	X	X		
Conduct evidence based experience sharing and operational research on service delivery		X		X	
Endorse the cMYP and print and distribute to all regions, zones, districts and HFs	X				

CHAPTER FOUR

COSTING, FINANCING AND FINANCING GAPS

4.1 Macroeconomic Information

The macroeconomic information was included for purposes of placing the costing and financing information. The 2014 GDP per capita is around 630 USD (CIA World fact book) and it is expected to increase by a minimum of 10% annually.

Table 25: Macroeconomic information, current and projected, Ethiopia

MACROECONOMIC INDICATORS	2014	2016	2017	2018	2019	2020
GDP per capita	630	693	762	838	922	1014
Total Health Expenditures per capita (THE per capita)	3.80	4.56	5.47	6.57	7.88	9.46
Government Health Expenditures (GHE %)	9.1%	9.6%	10.0%	10.5%	11.1%	11.6%

4.2 Methodology for costing the cMYP

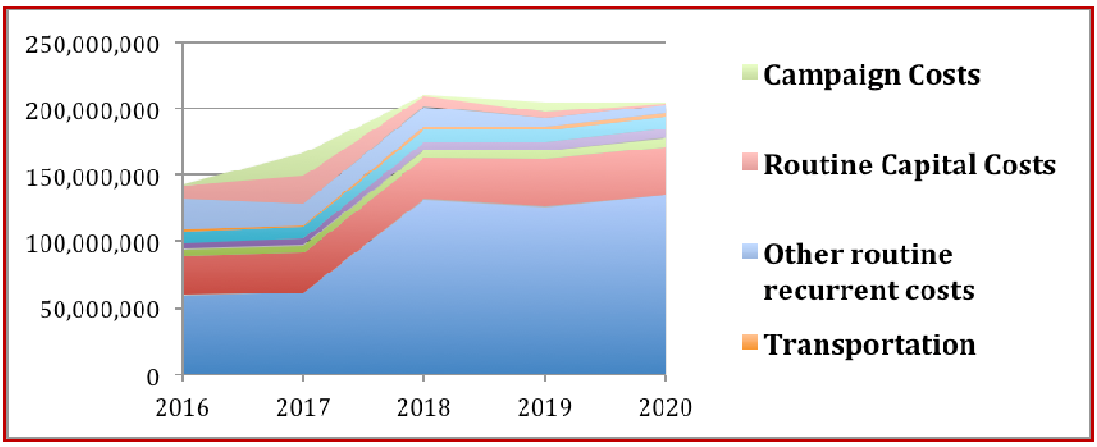
For the planned activities to successfully take place during the planned period, it is key to have adequate financing for all the proposed activities. To ensure the financing is secured, it is the responsibility of the Ministry of Health and the EPI program supported by the ICC to ensure the availability of the required financial and material support from both local and international sources.

The cost implications for the proposed program activities and how they are related to the available financing for respective categories of the program is highlighted in this section. Strategies are proposed to improve financial viability. Implementing this multiyear plan will require increasing costs over the 2016-2020 periods. The major increases in programme cost are driven mainly by:

- Introducing of new vaccines
- Supplemental Immunization activities
- Increases in population of children to be vaccinated due to coverage improvements and increase in the annual birth cohort.

- Cold chain expansion and rehabilitation

Figure 14: Immunization Program projection of future resource requirements, 2016-2020 (shared costs are not included)



The activities and inputs of the different EPI system components are coated. The costs are derived in different ways based on the interventions planned activities. Considering the product of unit prices, and quantities needed each year along with proportion of time used for immunization was used for costing inputs like vaccines, personnel, vehicles, cold chain equipment, etc.

Based on the immunization practice rule of thumb was applied such as a percentage of fuel cost as representative of maintenance costs for vehicles. This was used for deriving costs for injection supplies, and maintenance of equipment, and vehicles.

Based on the information retrieved from the past expenditure data of lump sum was used to estimate future expenditure. E.g. Cost per child for specific campaign or training activities. All these different approaches are brought together in a pre-designed cMYP Excel costing tool. These derived costs are based on the following components:

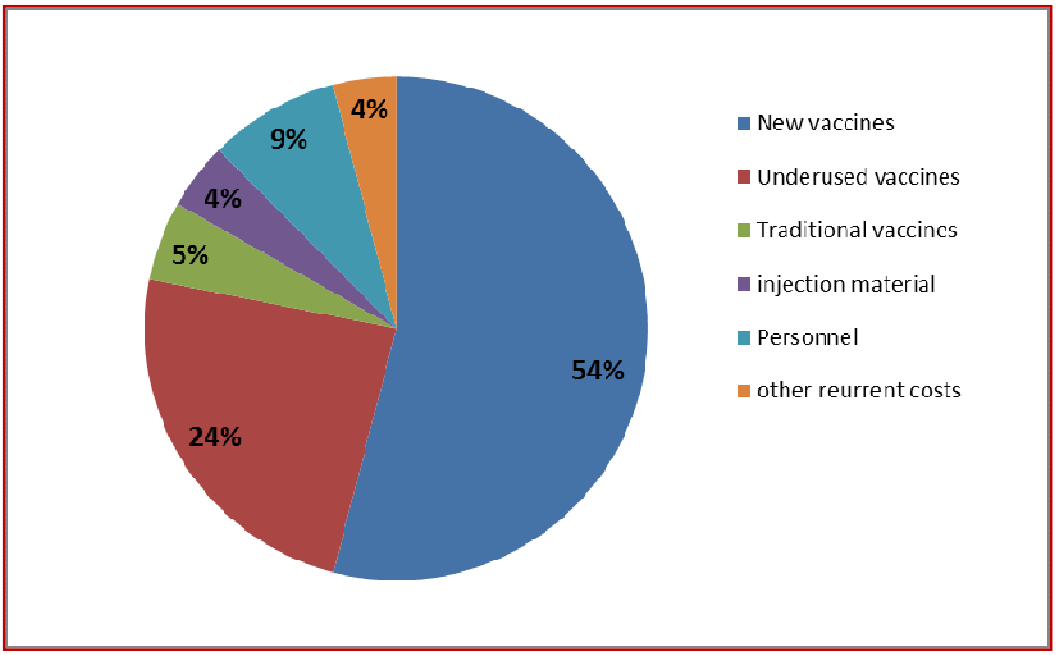
- Vaccines and injection supplies
- Personnel costs (EPI specific and shared)
- Vehicles, and transport cost
- Cold chain equipment, maintenance and overheads

- ❖ Operation cost for campaigns
- ❖ Program activities, other recurrent costs and surveillance

4.2.1 The cost profile of baseline year (2014)

The cost profile of routine immunization was analysed for 2014 as a baseline, and 54% of all the costs was spent on new vaccines (PCV and Rota) and 24% of the cost was spent on under used vaccines (DPT-HepB-Hib), 9% of all the costs was spent on personnel, 5% on transportation vaccines, 4% on injection materials, and 4% on other recurrent costs which include disease surveillance, program management cold chain maintenance and short term training. The details are illustrated in figure 6 below.

Figure 15: Costing baseline profile of routine immunization in Ethiopia, 2014



4.3 Costing of cMYP 2016-2020

4.3.1 Vaccines and injection equipment

The costs are function of the unit prices for individual vaccines, with quantities determined by the target population, which is adjusted for by coverage and wastage objectives. The prices are based on information from UNICEF supply division. For the period of five years a total of 734 million USD will be needed for the traditional, under

used and new vaccines and injection materials, the majority of this will be for the new vaccines (PCV, Rota, HPV, and Men A will cost 514 million USD), and under used vaccine (DPT-HepB-Hib, IPV, MR and Yellow Fever will cost172 million USD) and the cost of traditional vaccines will be 19 million USD.

4.3.2 Personnel costs (EPI specific and shared)

Over the period of 2016-2020, the total programme cost (minus shared costs) is over 930 million USD (902 million for routine and 28 million for campaigns). The cost estimates as with vaccines and injection equipment are based on unit expenditure on different personnel cadres working in EPI at the different levels of the system and the numbers of personnel, adjusted for by time spent on EPI related activities. The cost and time spent on supervision, and outreach activities were included for the different cadres of staff at the different level of the system. The unit expenditures are based on Government gross wages. The quantities available and needed for the duration of the cMYP were included. Time spent on EPI was estimated by input of the different level of staff at different levels. The total cost (salary, allowance during supervision and outreach activities) for personnel working in EPI related activities is about 206 million USD.

4.3.3 Cold chain equipment procurement and maintenance

Ethiopia developed a multi-year cold chain rehabilitation plan and the requirements of the cold chain equipment considered the current gap, replacement of the over aged cold chain equipment and the new health facilities to be constructed, construction of additional cold rooms at national and sub-national level, and procurement of spare parts, refrigerated trucks and cold chain monitoring tools. To replace old equipment, furnish all new health facilities, fill the current gap and procure spare parts and cover the maintenance, procure additional cold rooms a total of 45,714,000 USD will be needed for the period of five years.

4.3.4 Operational costs for campaigns

Ethiopia is a priority country for polio eradication and currently conducting supplementary immunization activities to prevent polio importation and re-infection. Technical advisory group recommended conducting of polio supplementary

immunization activities on twice a year at national level. Ethiopia is also a priority country for measles control and neonatal tetanus elimination. Measles follow-up through supplementary immunization should be conducted every 2 to 3 years covering children 6 to 59months and corrective TT supplementary immunization will be conducted in those areas selected as high risk areas (low routine coverage and low SIAs coverage in the last TT SIAs). The total cost estimated to conduct the planned supplemental immunization activities is 28 million USD.

4.3.5 Costs for immunization by components cMYP (2016-2020)

The total program cost of both EPI specific and shared costs during the five years period is 1,137 million. Vaccine and injection material costs account for 65% followed by shared health system costs (18%) and Service delivery costs (7%).

Table 26: Costs for the different cMYP components (shared and EPI specific)

COST CATEGORY	EXPENDITURES IN 2014	FUTURE BUDGET REQUIREMENTS					
		2016	2017	2018	2019	2020	TOTAL 2016-2020
Vaccines (routine only)	85,591,145	94,249,106	97,120,170	169,008,457	168,313,941	177,778,905	706,470,578
Injection supplies	4,396,987	4,674,729	4,851,732	5,998,118	6,375,822	6,599,506	28,499,907
Personnel	8,585,687	8,758,758	8,958,975	9,139,566	9,322,682	9,509,136	45,689,117
Transportation	1,283,867	1,413,737	1,456,803	2,535,127	2,524,709	2,666,684	10,597,059
Maintenance and overhead	88,083	241,307	241,307	241,307	241,307	241,307	1,206,533
Short-term training	880,375	3,521,500	7,087,905	7,071,075	1,187,500	1,187,500	20,055,480
IEC/social mobilization	70,000	85,680	97,007	109,831	117,629	122,381	532,528
Disease surveillance	2,730,000	3,076,983	3,154,216	3,223,734	3,419,738	3,592,776	16,467,446
Programme management	967,992	15,829,397	5,419,135	3,892,181	1,016,391	1,067,211	27,224,315
SUBTOTAL	**104,594,136**	**131,851,196**	**128,387,249**	**201,219,395**	**192,519,719**	**202,765,405**	**856,742,963**
Routine Capital Costs	**4,963,085**	9,926,170	21,140,994	8,542,362	4,883,622	1,220,906	45,714,053
Campaign Costs	**46,178,578**	**1,710,946**	**17,537,195**	**745,140**	**7,637,687**	**782,863**	28,413,831
Shared Health Systems Costs	**38,835,524**	**39,625,590**	**40,440,425**	**41,263,325**	**42,088,814**	**42,930,590**	206,348,744
TOTAL	**194,571,323**	**183,113,901**	**207,505,861**	**251,770,222**	**247,129,842**	**247,699,763**	**1,137,219,591**

CHAPTER FIVE

MONITORING AND EVALUATION

The cMYP provides a comprehensive overview of the National Immunization Programme and is the document to provide direction and guidance to national and subnational levels for incorporation into their annual plans. It is also the documents that will advise national policies in setting national targets for all immunization indicators. National performance will therefore be monitored based on the indicators set in the cMYP. The cMYP contain a set of programme and financial indicators. These indicators will be monitored and feedback provided to policy and programme managers. Monitoring of the cMYP will be done within the existing health sector monitoring and reporting framework.

The MoH, it's Agencies and Development Partners have agreed to a set of national indicators for monitoring the sector and it includes indicators for monitoring the health of the population at both governmental and international levels. Data for measuring these indicators are collected routinely and supplemented with periodic reviews and surveys. The Ministry's routine process reports are collated from sub-national levels through to national level. An annual review process is conducted culminating in a health summit attended by all main stakeholders in health. During the health summit the report of an independent review of the sector is presented and discussed. Surveys such as the Maternal Mortality Surveys (MMS), Demographic and Health Surveys (DHS) and Multiple Indicator Cluster Surveys (MICS) are conducted periodically to provide information on the health status of the country. Routine monitoring is carried out periodically from national to sub-national levels to monitor the implementation of programmes and plans.

The NIP will also be assessed through monthly and quarterly reports from the district levels. With the development of the cMYP, an annual NIP review will be instituted as a forum for bringing together all relevant stakeholders within the private and public sector including civil society organizations and NGOs. This review meeting is intended to allow for greater participation of district level non state sector organizations in information sharing and consensus building.

In addition, a mid and end term evaluation will be organized specifically for the NIP to evaluate progress and performance in the implementation of to contribute to the performance analysis of the sector and more specifically provide direction on future investments in the NIP.

5.1 Indicators for monitoring the cMYP

5.1.1 Macroeconomic Indicators

The NIP has been and continues to be one of the health programmes with high government commitment. The government of Ghana is committed to ensuring that new and underused vaccines are available to the population for the prevention of all forms of diseases. Total government commitment also translates into its budget allocation to the health sector. Key indicators for measuring government commitments to health and to the NIP will be assessed through a set of macroeconomic indicators.

Table 27: Indicator for financial monitoring

GDP Per capita	2016	2017	2018	2019	2020
Government Health Expenditure (GHE) as % of GDP					
Total Health Expenditure (THE) per capita					
Total Health Expenditure (THE) as % of GDP					
Total NIP Expenditure as % of THE					
Total NIP Expenditure as % of GHE					

5.2 Financial Indicators

The NIP will also pay close attention to monitor financial indicators within the cMYP.

5.3 Programme Indicators

The NIP will continue to monitor and report on the coverage of all antigens through the routine reporting system. The cMYP provides targets for coverage and wastage rates for routine immunization.

5.4 Surveillance System

The NIP will work with the Public Health Emergency Directorate to monitor Vaccine preventable diseases closely And AEFI after the introduction of two new vaccines in

2011. This will include post introduction monitoring activities. A set of monitoring indicator swill be used to monitor post implementation activities.

5.5 Monitoring and Evaluation framework cMYP

Table 28: Monitoring and Evaluation frame work for cMYP

IMMUNIZATION SYSTEM SUBCOMPONENT	SUGGESTED INDICATORS	SOURCE OF DATA	BASE LINE	TARGETS				
			2014/15	2016	2017	2018	2019	2020
1. PROGRAMME MANAGEMENT								
Law & regulation	What numbers of functions are conducted by the NRA?	NRA terms of reference	1					
	Legislation on immunization financing establishing line item for vaccines in national health budget	Immunization law	Y					
	Legislation on immunization financing identifying sources of public revenue for immunization financing	Immunization law	Y					
Policy	Has the national immunization policy been updated?	National immunization policy	Y					
	High-risk plan for disadvantaged communities	High-risk plan	Y					
Planning	Does the country have an annual work plan for Immunization?	National immunization operational plan	Y					
	Number of districts with an annual micro plan For immunization (cumulative)?	Immunization programme records	?					
Coordination	Number of ICC (or equivalent) meetings held last year at which routine immunization was Discussed?	ICC minutes	Y					
	What were the numbers of NITAG (or equivalent) meetings Held last year?	NITAG minutes	0					
Advocacy	Number of presentations on immunization performance made to parliament	Immunization programme records	0					
2. HUMAN RESOURCES MANAGEMENT								
HR numbers	Number of health workers/vaccinators per 10 000	MoH human resource data	?					

IMMUNIZATION SYSTEM SUBCOMPONENT	SUGGESTED INDICATORS	SOURCE OF DATA	BASE LINE	TARGETS				
			2014/15	2016	2017	2018	2019	2020
Capacity-building	Number of health workers & managers accredited for immunization services through MLM training (cumulative)	National programme (training report) records	?					
Supervision	Average number of regional supervision visits to each district level per year	National programme(supervisory report) records	4					
3. COSTING AND FINANCING								
Financial sustainability	What percentage of total routine vaccine spending was financed using government funds (including loans and excluding external public financing)?	Programme records	??					
	Is there a line item in the national budget for immunization that is 100% funded?	National health budget	Y					
	Government expenditures on routine immunization per surviving infant (JRF 6700)	JRF	?					
	Sub-national routine immunization expenditures per surviving infant	Immunization programme records	?					
4. **VACCINE SUPPLY, QUALITY & LOGISTICS**								
Vaccine supply	Was there a stock out at national level during the last year?	Programme records	Y					
	If yes, specify duration in months		1.5					
	If yes, specify which antigen(s)		ND					
Cold-chain/ logistics	Percentage of districts with adequate numbers of functional cold-chain equipment	Immunization programme records	ND					
	Year of last inventory assessment for all cold-chain, transport and waste management equipment (or EVM)	EVM report	ND					
Waste disposal	Availability of a waste- management plan	Waste management plan and	Y					

IMMUNIZATION SYSTEM SUBCOMPONENT	SUGGESTED INDICATORS	SOURCE OF DATA	BASE LINE	TARGETS				
			2014/15	2016	2017	2018	2019	2020
		EVM report						
5. IMMUNIZATION SERVICES								
Routine coverage	Penta 3 coverage	National health information	87%					
	Percentage of districts with >80% coverage	National health information	64.4%					
	National Penta 1–Penta 3 drop-out rate	National health information	5.4 %					
	Percentage of districts with drop-out rate Penta 1–Penta 3 >10%	National health information	23.9%					
Equity	Number of districts >80% coverage	National health information	541					
	Penta 3 Percentage gap between lowest– highest socio-economic quintile	DHS survey	ND					
Integration	Percentage services provided at fixed facilities	Coverage survey	ND					
New vaccines	Percentage PCV coverage	National health information	85					
	Percentage of HPV							
	Percentage Men A, MR,YF							
6. SURVEILLANCE & REPORTING								
Routine surveillance	Percentage of surveillance reports received at national level from districts compared to expected number of reports expected	National health information or public-health surveillance system						
	(not clear)							
Injection safety	Percentage of districts that have been supplied with adequate (equal or more) numbers of AD syringes for all routine immunizations	Immunization programme records	100					
Adverse events	National AEFI system is active with a designated national committee							

IMMUNIZATION SYSTEM SUBCOMPONENT	SUGGESTED INDICATORS	SOURCE OF DATA	BASE LINE	TARGETS				
			2014/15	2016	2017	2018	2019	2020
7.								
Communication Strategy	Availability of communication a plan							
Research	Year of last study on community knowledge, attitudes and practices in relation to immunization							
Demand	Percentage services provided at fixed facilities							

5.6 Immunization Programme Annual work plan for 2016

Table 29: Immunization program annual work plan for 2016

Activities	Consolidated & Integrated activities	Where	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec	Unit Responsible	Cost $	Funds available		Short fall
																	Govt.	Partners	
SERVICE DELIVERY AND PROGRAMME MANAGEMENT																			
1. Conduct micro-planning for RED in the context of integrated mother and child survival approach	Yes	District / HF level													EPI, MCH				
2. Timely desimburse funds for implementation of planned activities	Yes	District													Financial Depart (Federal, Regional. & district level)				
3. Implement the minimum integrated MCH package in health facilities with fixed vaccination posts as wells as in outreach / mobile sessions in the context of RED	Yes	District / HF level													EPI & MCH at District / HF level				
4. Conduct Community Health Days 2 times per year	Yes	District / HF level													EPI, MCH & Nutrition at all levels				
5. Engage nongovernmental organizations & private sector in the delivery of services	Yes	District / HF level													District Directorate of Health				
6. Implement African Vaccination Weeks	Yes	District / HF level													EPI & MCH at all levels				
SERVICE DELIVERY AND PROGRAMME MANAGEMENT																			
7. Involve health workers and community health workers in the identification of missing children at the health facility and community levels, and immunize them		District / HF level													EPI, MCH & Nutrition District & HF level				
8. Conduct regular risk assessment for Polio importation & measles outbreak		District													EPI & Surv. Central level				

Activities	Consolidated & Integrated activities	Where	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec	Unit Responsible	Cost $	Funds available		Short fall
																	Govt.	Partners	
9. Introduce MR *															EPI Unit all levels				
10. Conduct post MR introduction evaluation		All levels													EPI & Surv Central level				
12. Institutionalize monthly meetings for data quality analysis at all levels		All levels													MCH, EPI & Surv Units at all levels				
13. Use appropriate tools to monitor district / health facility performance and the timeliness and completeness of reports		Central, Regional & District levels													EPI & Surv Units at Central, Regional & District levels				
14. Regularly evaluate coverage per antigen and take appropriate corrective actions		All levels													EPI & Surv Units at Central, Regional & District levels				
15. Provide informatics materials and tools for data management process		District level													EPI & Surv Units at Central & Regional levels				
16. Organize periodic meetings (quarterly) for EPI and other mother and child survival program review		Central & Regional levels													EPI & Surv Units at Central & Regional levels				
17. Conduct periodic auto-evaluation of quality of data in each district - DQS		District / HF level													MCH & EPI Units at Regional & District levels				
18. Train district teams in planning and implementation of integrated RED approach, in the context of mother and child survival		District / HF level													MCH, Nutrition, EPI & Surv Units at Central & Provincial				

Activities	Consolidated & Integrated activities	Where	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec	Unit Responsible	Cost $	Funds available		Short fall
																	Govt.	Partners	
															levels				
19. Conduct training for districts on MLM		District / HF level													EPI & Surv Units at Central & Regional levels				
20. Develop standard integrated supervision checklist		Central													MCH, EPI & Surv Units at Central level				
21. Conduct regular integrated supportive supervision to districts		All levels													MCH, EPI & Surv Units at all levels				
22. Provide timely feed back		All levels													MCH, EPI & Surv Units at all levels				
23. Update pre & in service curriculum and training materials		Central & Regional levels													Central level Training Depart in collaboration with Central levels EPI & Surv Units				
24. Set up a unit at national level in the Human resources Department, to coordinate pre and in service training related to EPI, including follow up of trainees		Central & Regional levels													Central level Training Depart in collaboration with Central levels EPI & Surv Units				
25. Advocate for deployment of human resources at various levels of the system to fill the vacant positions in the new comprehensive EPI structure at different levels		All levels													Human Resources Central & provincial level				
26. Payment of salaries of full-time NIP health workers															Human Res Central & Regional. level				
27. Training / Refresh of NRA staff on	No	Central													NRA in				

Activities	Consolidated & Integrated activities	Where	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec	Unit Responsible	Cost $	Funds available		Short fall
																	Govt.	Partners	
vaccine regulatory oversight matters		team													collaboration with EPI Unit Central level				
28. Disseminate the EPI cMYP and use it as an advocacy document															Central EPI & Surv Units				
29. Dialogue with MoH Planning Directorate and MoF															Ministry/general director				
30. Consultation with partners, local district governments, civil society organizations and private sector		Central, Regional & District levels													Nat. regional. & Dist Direct of Health in coordination with all MDG4&5 related Program Units at all levels				
31. Coordinate immunization financing through the ICC to ensure adequate and appropriate donor support		Central level													ICC and EPI Unit Central level				
32. Secure Government co-financing for new vaccines, sustain and increase Government contribution to EPI by at least 10% annually, and ensure long term financial requirements															Central level Planning Depart, Financial Depart in collaboration with EPI Unit				
33. Conduct regular technical coordinating meetings, ICC meetings, feedback to partners															EPI Unit al Central level				
34. Monitor vaccine wastage rate at all levels		All levels													EPI Unit al all levels				
35. Conduct joint planning involving different MDG4&5 related programs, implementation, Sharing of available resources, monitoring, supervision		Central and Regional level													All MDG4&5 related program Units at				

Activities	Consolidated & Integrated activities	Where	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec	Unit Responsible	Cost $	Funds available		Short fall
																	Govt.	Partners	
and evaluation															Central & regional levels				
36. Conduct studies on knowledge, practices and attitudes of communities, assess existing communication gaps in reaching communities and develop adequate social mobilization plan towards immunization & other child survival programs		Districts													Central EPI Unit in collaboration with Health Promotion				
37. Develop evidence-based IEC and other social mobilization materials, print and disseminate		Central level													Central EPI Unit in collaboration with Health Promotion				
38. Contract technical assistance for support in developing a child survival communication plan		Central level													Central EPI, MCH, Nutrition Units in collaboration with Health Promotion				
39. Disseminate the communication plan and make it available at all levels		All levels													All levels EPI, MCH, Nutrition Units in Collaboration with Health Promotion				
40. Orientation of health workers, community health workers, staff of relevant partners		Districts													District EPI, MCH, Nutrition & Health Promotion				
ADVOCACY AND COMMUNICATION																			
41. Utilize all media and means to	Yes	Central,													All levels				

Activities	Consolidated & Integrated activities	Where	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec	Unit Responsible	Cost $	Funds available		Short fall
																	Govt.	Partners	
reach the families		Regional & District levels													EPI, MCH, Nutrition Units in collaboration with Health Promotion				
42. Develop and use monitoring indicators	Yes	District & HF levels													All levels EPI, MCH, Nutrition Units in collaboration with Health Promotion				
43. Meetings with religious leaders from vaccination objectors	Yes	District & HF levels													All levels EPI, MCH, Nutrition Units in collaboration with Health Promotion				
44. Conduct public media campaign and focal group discussions	Yes	Central, Regional & District levels													All levels EPI, MCH, Nutrition Units in collaboration with Health Promotion				
SURVEILLANCE																			
45. Update and print surveillance manuals, guidelines and training materials	Yes	Central level													Central EPI & Surv Units				
46. Disseminate updated manuals, guidelines and training materials	Yes	All levels													All levels EPI & Surv Units				
47. Train / Refresh surveillance focal points	Yes	All levels													All levels EPI & Surv Units				
48. Conduct regular sensitization of health workers / clinicians, conduct regular sensitization of community	Yes	District & HF level													Surveillance Focal Persons at all levels				

Activities	Consolidated & Integrated activities	Where	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec	Unit Responsible	Cost $	Funds available		Short fall
																	Govt.	Partners	
health workers, leaders, religious, TBAs, traditional healers and involve them in active surveillance																			
49. Provide adequate supply of specimen collection tools and reversal cold chain support at country level and Provide support for shipment of specimens form reporting sites to national labs and to WHO accredited referral labs	Yes	District & HF level													EPI & Surv Units Central & regional levels				
50. Conduct active case search of AFP/Polio, Measles, MNT and other notifiable diseases	Yes																		
51. Conduct quarterly surveillance review meetings	Yes	Central, Regional & District levels													EPI & Surv Units Central & regional levels				
52. Regularly supervise and monitor activities and performance of surveillance system at all levels	Yes	All levels													All levels EPI & Surv Units				
53. Provide regular and timely feed back on performance of each province and district, and produce and distribute periodic quarterly informative bulletins	Yes	Central & Regional levels													EPI & Surv Units Central and Regional levels				
54. Document Polio Eradication, Measles control/elimination and MNT elimination activities	Yes	District & Regional level													EPI & Surv Units Central level				
55. Provide incentives to Surveillance and EPI focal persons	Yes	Regions													EPI & Surv Units at Central level				
56. Organize periodic meetings with different committees	Yes	Central level													EPI & Surv Units Central level				
57. Provide essential materials, operational funds and technical	Yes	Central & Regional													EPI & Surv Units Central				

Activities	Consolidated & Integrated activities	Where	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec	Unit Responsible	Cost $	Funds available		Short fall
																	Govt.	Partners	
support to measles lab, Pneumococcal & Rotavirus labs, for conducting surveillance of these diseases		levels													and Provincial levels in collaboration with				
58. Perform regular quality control assessment of national measles, Pneumococcal & Rotavirus labs	Yes	Central & Regional levels													WHO/IST in collaboration with EPI & Surv Units Central level				
59. Train/ Refresh lab technicians on recent technology and knowledge and train Data Managers on data management	Yes	Central & Regional levels													WHO/IST in collaboration with EPI & Surv Units Central level				
60. Conduct Rota disease burden assessment	Yes	Central & Regional levels													EPI & Surv Units Central level				
61. Sensitize clinicians and EPI staff on AEFI monitoring and reporting, monitor AEFI, investigate, respond to and report AEFI	Yes	HF & Community levels													EPI & Surv focal persons at all levels				
62. Provide adequate tools and training for AEFI reporting	Yes	Districts & HF level													EPI & Surv Units Central				
63. Include AEFI in national data base for district monitoring & maintain a register of AEFI	Yes	Central, Regional & District levels													EPI & Surv Units Central and Regional levels				
VACCINE SUPPLY, QUALITY AND LOGISTICS																			
64. Procure vaccines and related injection safety materials from internationally recognized manufactures	Yes	Vaccine & Injection safety materials Producers /Suppliers													Coordination with EPI Unit Central level / UNICEF				
65. Distribution of vaccines and	Yes	Districts /													EPI Units at				

Activities	Consolidated & Integrated activities	Where	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec	Unit Responsible	Cost $	Funds available		Short fall
																	Govt.	Partners	
related injection safety materials		HF level													Central, regional and District levels				
66. Build incinerators in priority health facilities identified in each district	Yes	Districts / HF level													Envir Health in coordin with EPI Unit & Nursing Depart Units, Central & Regional levels				
67. Produce, print and distribute waste management guidelines	Yes	Districts / HF level													Envir Health in coordin with EPI Unit & Nursing Depart Units, Central & Regional levels				
68. Train focal persons on waste management in priority health facilities in each district, and provide orientation to health workers in general on injection safety practices	Yes	Districts / HF level													Envir Health in coordin with EPI Unit & Nursing Depart Units, Central & Regional levels				
VACCINE SUPPLY, QUALITY AND LOGISTICS																			
69. Train health workers on vaccine stock and cold chain management	Yes	All levels													EPI Units at Central, regional and District levels				
70. Provide supportive supervision on vaccine management & cold chain at all levels	Yes	All levels													EPI Units at Central, regional and District levels				

Activities	Consolidated & Integrated activities	Where	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec	Unit Responsible	Cost $	Funds available		Short fall
																	Govt.	Partners	
71. Install vaccine & related injection materials stock management tools at district level (DVDMT) and Train / Refresh focal persons on DVDMT tool at district level	Yes	Districts / HF level													EPI Units at Central, regional and District levels				
72. Purchase refrigerators to increase storage capacity at district level, replace old and depleted CC expand the fixed vaccination posts	Yes	Regional District & HF levels													Central level Procur. Unit in coordin with Central EPI Unit				
73. Produce and disseminate CC guidelines	Yes	All levels													Central level EPI Unit in coordin with Maiten. Depart				
74. Refresh cold chain Maintenance technicians	Yes	Central & Regional levels													Central level Maiten Depart in coordin with EPI Unit				
VACCINE SUPPLY, QUALITY AND LOGISTICS																			
75. Procure spare parts for maintenance of cold chain and perform maintenance activities	Yes	All levels													Central level Procurement Unit in coordination with Central EPI Unit				
76. Procure transport for EPI and Surveillance activities	Yes	All levels													Central level Procurement Unit in coordination with Central EPI Unit				
77. Maintenance of EPI offices, other capital equipment, water, electricity and overhead	Yes	All levels													All levels Mainten coordinated with EPI				

Activities	Consolidated & Integrated activities	Where	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec	Unit Responsible	Cost $	Funds available		Short fall
																	Govt.	Partners	
															units				
78. Other capital investment	Yes	All levels													All levels, Mainten coordinated with EPI units				