REPUBLIC OF LIBERIA

MINISTRY OF HEALTH
NATIONAL EPI STRATEGIC PLAN
2016 -2020 (REVISED)

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ACKNOWLEDGEMENT

The Comprehensive Multi- Year Plan (cMYP) 2016 -2020 is developed as a part of standard cycle of long term EPI planning and as a partial requirement for receipt of Global Alliance for Vaccine and Immunization (GAVI) support. The plan is developed within the framework of the Global Immunization Vision and Strategy (GIVS) and Global Vaccines Action Plan(GVAP) to ensure sustainable development of the EPI programme.

On behalf of the Ministry of Health (MOH), I would like to acknowledge all individuals, programme managers/division heads of the MOH, and partner organizations, who in their various ways provided invaluable contributions to the successful completion of the Comprehensive Multi-Year Plan.

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Hon. Minister

Ministry of Health, Liberia

LIST OF ACRONYMS AND ABBREVIATIONS

1. AEFI	Adverse Events Following Immunization
2. AD	Auto-disabled
3. AFP	Acute Flaccid Paralysis
4. ARI	Acute Respiratory Infections
5. BCC	Behavioral Change Communication
6. BCG	Bacillus-Calmette-Guerin
7. CDC	Center for Disease Control & Prevention
8. CHDD	Community Health Department Director
9. CHO	County Health Officer
10. CHT	County Health Team
11. cMYP	Comprehensive Multi-Year Plan
12. CSFP	Child Survival Focal Person
13. CSO	County Surveillance Officer
14. CWIQ	Core Welfare Indicator Questionnaire
15. DHO	District Health Officer
16. DQA	Data Quality Audit
17. DSO	District Surveillance Officer
18. EPI	Expanded Programme on Immunization
19. EPR	Emergency Preparedness and Response
20. EVD	Ebola Virus Disease
21. GAVI	Global Alliance for Vaccines and Immunization
22. GDP	Gross Domestic Product
23. GIVs	Global Immunization Vision and Strategies 2005 -2015
24. GPEI	Global Polio Eradication Initiative
25. GVAP	Global Vaccines Action Plan
26. HepB	Hepatitis B Vaccine
27. Hib	Haemophilus Influenza Type b Vaccine
28. HPV	Human Papillomavirus Vaccine
29. ICC	Inter-agency Coordinating Committee
30. IDSR	Integrated Disease Surveillance and Response
31. IEC	Information, Education and Communication
32. IMR	Infant Mortality Rate
33. IPC	Inter-personal communication
34. LLITN	Long Lasting Insecticide-Treated Nets

35. LMHRA	Liberia Medicine & Health Products Regulatory Authority
36. MCV	Measles Containing Vaccine
37. MDGs	Millennium Development Goals
38. MDVP	Multi-Dose Open Vial Policy
39. MNT	Maternal and Neonatal Tetanus
40. MOH	Ministry of Health
41. NCC	National Certification committee
42. NGO	Non-governmental Organization
43. NIDs	National Immunization Days
44. NPEC	National Polio Expert Committee
45. OIC	Officer-In-Charge
46. OPV	Oral Polio Vaccine
47. Penta	Pentavalent Vaccine
48. PHC	Primary Health Ccare
49. PIE	Post-Introduction Evaluation
50. RED	Reach Every District
51. RI	Routine Immunization
52. SIAs	Supplemental Immunization Activities
53. SOPs	Standard Operating Procedures
54. SWOT	Strengths, Weaknesses, Opportunities & Threats
55. TOT	Training of Trainers
56. TCV	Typhoid Conjugate Vaccine
57. U5MR	Under-Five Mortality Ratio/Rate
58. UNICEF	United Nations Children Fund
59. UNMIL	United Nations Mission in Liberia
60. USAID	United States Agency for International Development
61. Vit. A	Vitamin A
62. VPD	Vaccine-Preventable Diseases
63. VVM	Vaccine-Vial Monitor
64. WHO	World Health Organization
65. WPV	Wild Polio Virus
66. YF	Yellow Fever.

EXECUTIVE SUMMARY

The Liberia comprehensive multi-year planning (cMYP) process streamlined immunization planning activities at all levels. This document serves as a medium term strategic plan for Liberia's Expanded Programme on Immunization (LEPI). This plan provides strategic direction for the immunization programme over a five years' period considering seven cardinal planning steps. The cMYP is always prepared in consonance with the Ministry of Health Policy and Plan as well as the Investment Plan of Liberia's Health Sector. The current cMYP (2011-2015) ends December 31, 2015. To this, a new cMYP has to be develop to cover the period (2016 – 2020) to accommodate and plan for the introduction of two new vaccines – Rotavirus and Inactivated Polio Vaccine and Human Papillomavirus Vaccine Demonstration Project in Bong and Nimba Counties as well as other key activities. The cMYP will be aligned with all policy documents of the health sector to ensure coherent and dependability.

The governance of Immunization programme at the highest level is through the Inter-Agency Coordination Committee (ICC) through it chairman (Hon. Minister of Health) along with its members. In order to introduce the aforementioned vaccines, ICC members agreed that Liberia's EPI introduced the aforementioned new vaccines in 2014 and 2015 into its routine immunization programme which had to be postponed due to the devastating EVD outbreaks in 2014 and 2015.

The overall goal of Liberia's Expanded Programme on Immunization (EPI) is to reduce the morbidity and mortality of vaccine preventable diseases in children less than one year. This is intended to contribute substantially to the attainment of international and regional goals and targets; particularly the just ended Millennium Development Goals (MDGs) that seek to reduce the under-five mortality rate by two-thirds by 2015 and the new Sustainable Development Goals (SDGs) 2030, the attainment of a routine immunization coverage of 90% nationally with at least 80% coverage in every district and the reduction of measles mortality rate by 90% as compared to the 2000 levels by 2015. This includes extending the benefits of new and underused vaccines to all children; the integration of other child health interventions (e.g. Vitamin A and Mebendazole) into routine immunization by 2017.

Presently, there is about 745 health facilities of which 522 are offering regular immunization services across the entire country. This has help to increase access to regular immunization services

by its citizenry. Using Penta 3 and Measles as indicators, the trend in routine immunization coverage rates was progressive that isPenta-3 administrative immunization coverage from 31% 2004 to89% in 2013. However, this achievement was eroded due to the devastating EVD outbreaks that led to a drastic decline in the immunization coverage rates especially for third dose of pentavalent vaccine (Penta 3 - 63%) and measles containing vaccine (MCV – 58%) in 2014. Liberia introduced the pneumococcal conjugate vaccine in January 2014 while Rota virus and inactivated polio virus vaccines and HPV demo-project will be introduced in the first and second quarters of 2016 in line with the global goals and targets within the framework of the Global Immunization Vision and Strategy (GIVS) and Global Vaccine Action Plan (GVAP).

A comprehensive EPI review was conducted in early February 2012; this together with coverage surveys, EVD outbreak have provided the baseline for the development of new goals and set targets for the EPI programme for the next five years. In addition, situation analysis was carried out using SWOT method which informed the selection of national priorities that in turn informed the choice of key health activities especially for immunization.

General Objective:

The main strategic objective for 2016 -2020, is to increase national Penta-3 coverage from 71.4% card only (LDHS 2013) to at least 90% nationally with at least 80% coverage in all counties as well as measles mortality reduction by 90% as compared to the 2000 level by the end of 2020.

Specific objectives:

- Ensure the availability of a functional immunization supply chain (iSC) including the expansion of cold chain capacities at all levels
- Ensure that at least 90% of all cold chain equipment are maintained and functional at all levels by 2020;
- Ensure that there are no vaccine stock-outs by 2016 to 2020;
- Increase the Financial sustainability of the Programme;
- Introduce new vaccines
- Offer a minimum integrated health services package at all levels in line with National policy;
- Build capacity of health workers to implement policies and ensure the use of quality vaccine and safe immunization practices by 2020;
- Improve organization of immunization services to guarantee sustainable and equitable immunization for every child and other target groups by 2020 and;
- Improve the national surveillance system in line with the global goals by 2020.

There are enabling and impeding factors that affect effective implementation of all compon ents of the immunization system in the country. Access to improved and high quality immunization services, difficult terrain in most hard-to-reach areas, human resource constraints

and rumor about vaccination as a result of the EVD outbreaks have been major challenges encountered during the last years of implementation of the just ended cMYP (2011-2015). Amid these challenges there Government of Liberia has been committed to its co-financing contribution, provision of qualified and dedicated staff and effective collaboration with key health partners (UNICE, WHO, GAVI and USAID) in supporting the delivery of high quality immunization services.

Many inputs were placed in to the development of this document, ranging from situation analysis, through costing of all EPI systems areas (service delivery, advocacy and communication, surveillance, vaccine supply, quality and logistics, and programme management), annual workplan and finally monitoring and evaluation. Monitoring the implementation of this document will be conducted through periodic review meetings and time-test mechanism.

The total budget for the programme in five years for all components is U$166,689,820. As the plan is expected to be implemented within the framework of the Global Immunization Vision and Strategy, the Government of Liberia urges all partners working for the child survival and development programmes to mobilize resources to fill the gaps for the implementation of the strategic plan of action.

Chapter 1: Country Information - This describes the country profile and demographic information, administration and politics, socio-economic situation and environment, health status and Expanded Programme on Immunization of Liberia.

Chapter 2: Situation Analysis – This provides information on the current issues and challenges facing the immunization programme of Liberia. It further provides detail on the strengths and weaknesses of the immunization programme by system components in Liberia.

Chapter 3: Goals, Objectives, Key Activities, Indicators and Milestones – This chapter describes three goals (national, regional and global) and objectives of the cMYP, the strategic components, key activities, indicators and milestones. This chapter concludes by providing practical and actionable activities aim at strengthening identified weaknesses.

Chapter 4: Costing, Financing and financial gaps - This chapter elaborates plans for financing a nd sustainability of the plan.

Chapter 5: Monitoring and evaluation - This is the final chapter that describes the monitoring an d evaluation mechanisms put in place to ensure effective and efficient implementation of the plan.

PREAMBLE

Liberia being a signatory to the Convention of the Rights of the Child (CRC) has implemented activities over the past few years to ensure that "the right of every child to the highest attainable standard of health" was achieved. Under these umbrellas and those of the World Health Assembly and African Union resolutions, Liberia is signatory to the achievement of international and regional goals and targets, particularly the Millennium Development Goal to reduce the under-five

mortality rate by two-thirds by 2015; the attainment of a routine immunization coverage of 90% nationally with at least 80% coverage in every county and the reduction of measles mortality rate by 90% by 2015, including extending the benefits of new and underused vaccines; the sustainable elimination of vitamin A deficiency by 2015; to pursue the remaining goals of polio end game strategic plan by 2018 and elimination of maternal and neonatal tetanus by 2020.

The immunization services delivery in Liberia had many challenges in the past years due to the civil war. However, due to the level of peace and stability in the country, the Expanded Programme on Immunization (EPI) of the Ministry of Health (MOH) has initiated and sustained the reactivation process of all components of the programme at all levels.

When the first Liberia cMYP (2006 - 2010) was developed, the Country was in the phase of transition from conflict to recovery and reconstruction. This led to the reconstruction and construction of health facilities and relocation of health personnel to their various areas of assignments. The development of this cMYP (2016 – 2020) is taking place during the period that the Country is witnessing an unprecedented phase of development thus creating high expectation on the part of the population. This places greater demand on health services including immunization.

In the past few years, surveillance indicators for vaccine preventable diseases have recorded positive improvement. This is mainly due to improvement in immunization performance. However, occasional outbreaks continue to be recorded, increasing threats to the survival and development of children and women of childbearing age,

In this direction, the regular development of the Comprehensive Multi Year Plan has become a part of the health planning process in Liberia particularly gearing towards reducing the burden of childhood diseases, such as measles, tuberculosis, poliomyelitis, yellow fever, diphtheria, whooping cough, tetanus, hepatitis B, child pneumonia, diarrhea, cancer and meningitis.

The cMYP (2016 -2020) will reinforce the framework that will guide the EPI programme for the coming years taking into consideration the prevailing realities and circumstances that govern the African region and the world.

The process of developing this new cMYP has been an all-inclusive effort involving Government and immunization Partners.

It is hoped that this cMYP will provide the basis and impetus for increased collective action to control, eliminate and eradicate vaccine- preventable diseases in Liberia and to deal effectively with their negative impact on the child, individuals, families and the entire community.

Finally, the Government of Liberia, through the MOH is committing itself to reinforce the Global and regional conventions on the rights and survival of the child through the framework of the Global Immunization Vision and Strategies within this cMYP and urges all partners to join the Government of Liberia in identifying the means of support and working together through effective partnership to reduce the prevalence of disease burden especially those that are vaccines preventable in Liberia.

1. BACKGROUND

The projected population for 2015 is estimated at 4.02 million with a growth rate of 2.1% (NHPC, 2008). Land area approx. 111,370 square km and lies on the Western coast of Africa, bounded on the West by Sierra Leone, East by Côte d'Ivoire, North by Guinea and in the South by the Atlantic Ocean.

Population density is around 30 per square km, but very uneven, with four counties hosting about 70% of the total population. Massive population displacement in the rural areas during the war led to artificially accelerated urbanization, resulting in severe overcrowding in towns and cities. The literacy rate is less than 40%.

Administratively, Liberia is sub-divided into 5 Regions, 15 counties, 88 health districts and 136 political districts. There are more than 200 chiefdoms, 200 clans and 3,694 towns and human settlements in the country. However, the districts do not meet the criteria for health district as defined by the WHO. The accessibility within the country is very hard, especially from the County Capitals to reach the districts. The raining season covers almost 9 months in the year and the communications network: e.g. roads, telephone, radio and TV as well as the availability of energy sources and distribution is very limited.

Three fourths of the population live below the poverty line on less than US$1 a day. The economy is, however, making a modest recovery, and there is a gradual improvement in security in rural areas. Life expectancy at birth is 48 years: 48.7 for females and 44.7 for males.

1.1 National Health indices

Liberia's health services severely disrupted by years of conflict and looting was being revitalized but was still very weak when the Ebola virus disease epidemic struck.

The health status of Liberia before the EVD outbreak may be summarized as follows:

Table 1: Projected population for 2015 by age category and sub-population

County	Tot. Pop.	Live Births	Surviving Infants	Under 15 Pop	Under 5 Pop	Pregnant Women	CBA Women	HFs
Bomi	97,291	4,184	3,892	43,781	16,539	4,475	22,377	23
Bong	385,701	16,585	15,428	173,565	65,569	17,742	88,711	39
Gbarpolu	96,446	4,147	3,858	43,401	16,396	4,437	22,183	16
Grand Bassa	256,409	11,026	10,256	115,384	43,590	11,795	58,974	30
Grand Cape Mount	146,975	6,320	5,879	66,139	24,986	6,761	33,804	33
Grand Gedeh	144,873	6,230	5,795	65,193	24,628	6,664	33,321	18
Grand Kru	66,982	2,880	2,679	30,142	11,387	3,081	15,406	17
Lofa	320,217	13,769	12,809	144,098	54,437	14,730	73,650	56
Margibi	242,795	10,440	9,712	109,258	41,275	11,169	55,843	34
Maryland	157,225	6,761	6,289	70,751	26,728	7,232	36,162	24
Montserrado	1,293,349	55,614	51,734	582,007	219,869	59,494	297,470	111
Nimba	534,376	22,978	21,375	240,469	90,844	24,581	122,906	63
Rivercess	77,248	3,322	3,090	34,762	13,132	3,553	17,767	18
River-gee	82,707	3,556	3,308	37,218	14,060	3,805	19,023	19
Sinoe	118,425	5,092	4,737	53,291	20,132	5,448	27,238	33
National	4,021,019	172,904	160,841	1,809,459	683,573	184,967	924,834	534

- Infant mortality rate of 54/1,000 (LDHS, 2013);
- Under-Five/Child Mortality rate of 94/1,000 (LDHS, 2013);
- Maternal mortality ratios of 1,072/100,000 (among the highest in the world; LDHS 2013);
- The national fertility rate of 4.7;
- HIV prevalence rate between 2 and 12%;
- Exclusive breast-feeding of children less than six months of only 35%;
- Children under-fives who are underweight 15%;
- Access to safe water and sanitation around 24% and 26% respectively;

1.2 Health Infrastructure and personnel:

There were about 647 health facilities (both public and private) of which about 534 were actively providing immunization services before the EVD outbreak.

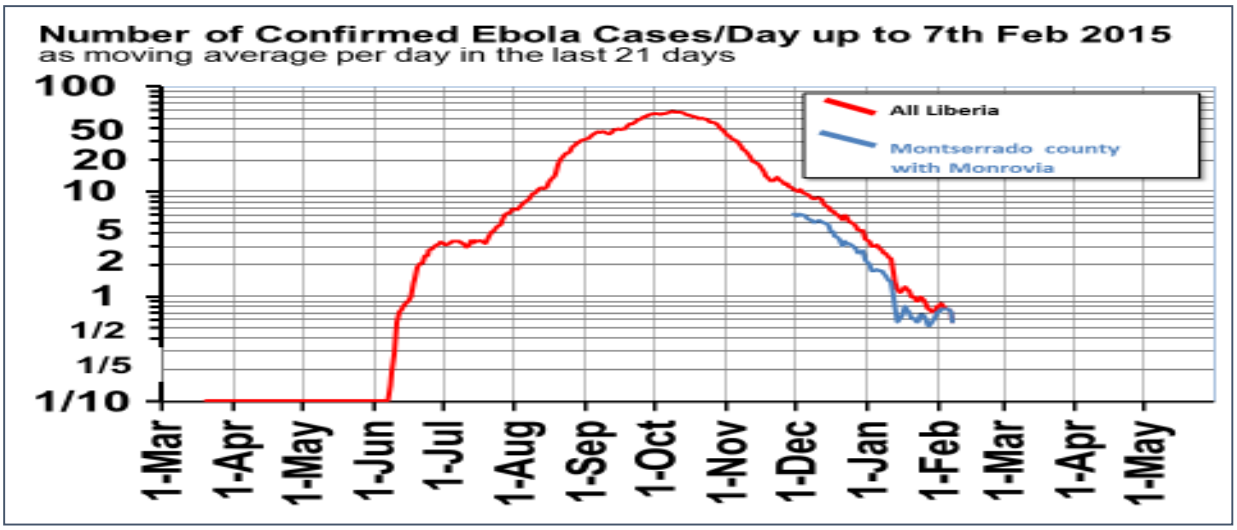
The health workforce before the EVD outbreak consisted of around 4,000 full-time and 1,000 part-time staff. This includes 168 physicians, 273 physician assistants, and 453 registered nurses and more than 1,000 nurse aides. The health care system was fragmented, uneven, and heavily dependent on vertical programmes.

1.3 Impact of EVD on Health and EPI services

The Ebola Virus Disease (EVD) outbreak started in Liberia in March, below are the major chronological events with regards to the EVD outbreak in Liberia

- 17th March 2014: Reports from Lofa County Health Officer of 2 suspected cases of hemorrhagic fever in Foya
- 21 March 2014: EVD was Laboratory confirmed in Guinea
- 22nd March 2014: Joint MOH-WHO team to Foya for investigation and response
- 24th March 2014: NTF is established
- 30th March 2014: EVD confirmed in Liberia
- 25th May 2014: Onset of 2nd wave of EVD outbreak (no case reported between 10 April and 24th May), The number of cases have been coming down since late October and the average number of cases is now less than 1 per day.

Chart 1: EVD Epidemic curve Liberia



The outbreak disrupted RI and all other health services except those related to the EVD response. The closure of many health facilities and the loss of large numbers of Health Care Workers (371 cases and 179 deaths including 4 vaccinators) to the EVD have adversely affected routine health services.

The table below shows the effect of the EVD outbreak on some of the indicators being monitored by the MoH

Table 2: Indicators monitored by the MoH

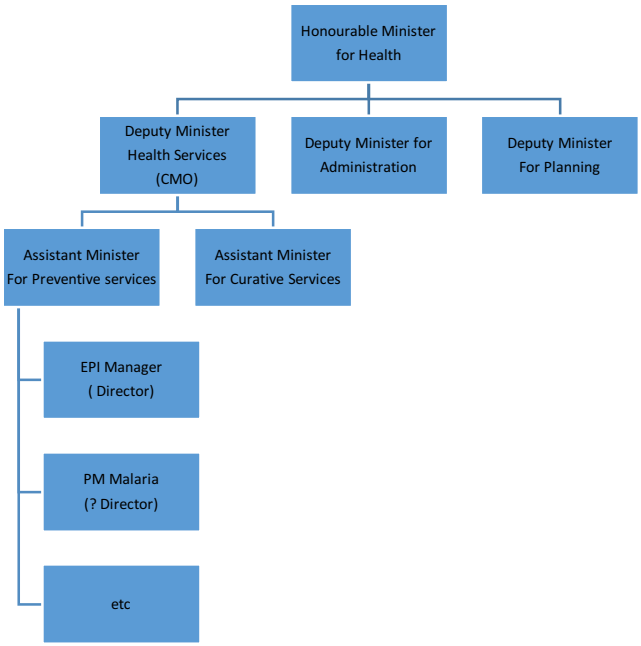
	Pre-Ebola (Q1 of 2014)	During Ebola crisis (Q3 of 2014)
HMIS completeness	86%	50%
Institutional deliveries	48 %	24%
Fully immunized children	58%	26%
4 ANC visits completed	63%	28%
ANC iron folate distribution	40%	29%
Intermittent preventive treatment of Malaria in pregnancy	52%	20%

Source: Ministry of Health, 2014

2.1 The Liberia Ministry of Health Structure and the EPI Programme

2.1.1 Ministry of Health Organogram

The Ministry of Health organizational structure is divided into three departmental pillars, which are under the direct management of the Minister of Health. The three departments are Planning, Research and Development, Administration and Health Services Department. The three departments are further sub-divided into different structures to ensure smooth operationalization of the Ministry's programmes. See structure below:



2.1.2 The National EPI Programme

The Expanded Programme on Immunization (EPI) was launched in 1978 in accordance with WHO recommendation to all member countries. EPI covers the 5 Regions, 15 Counties and 91 health districts within the country. The national EPI Policy is an integral part of the National Health Policy and Investment Plan which provide routine vaccination services to children less than one year as well as women of child bearing age especially pregnant women. According to the current immunization schedule, one dose of BCG is administer at birth and up to eleven months, three doses of Pentavalent vaccine (at 6, 10 and 14 weeks), four doses of OPV (at birth, 6, 10 and 14 weeks), three doses of Pneumococcal conjugate vaccine – 13 (at 6, 10 and 14 weeks), one dose of measles (at 9 months) and one dose of yellow fever (at 9 months). Pneumococcal conjugate vaccine was successfully introduced in Liberia in January 2014. Every woman of childbearing age (14-49 years) is also provided 5 doses of tetanus toxoid at minimum intervals of 4 weeks, 6 months, and 1 year. As part of the effective vaccine and cold chain management policy, the EPI Programme switched from manual temperature monitoring device to digital (Fridge Tag) in 2013.

Prior to the Ebola virus disease (EVD) epidemic outbreak, Liberia's immunization programme made significant progress over the years which led to gradual increase in the coverage for DPT3 (Penta-3) rose from 31% in 2004 to 89% in 2013 as a result of the following:

- Increase in the number of health facilities,
- Expansion of the cold chain capacity,
- Intensification of regular outreach activities and increased support from partners

2.1.2.1 The EPI Policy

Like all other components of the health delivery system of the MOH, the EPI programme operates on a well-defined EPI policy, which was introduced in the 80s formalized in 1993 and has been regularly updated since then. The latest version was revised in 2010.

The key aspects of the policy document are summarized in the general EPI policy statement, which reads: The Government of Liberia shall ensure equal access to quality EPI services to its people in the spirit of GIVs. This being non-negotiable, the Ministry of Health shall ensure that adequate and potent EPI antigens are available in the country at all times. All Agencies designated to procure antigens intended for use in Liberia must get approval from the Liberia Medicine and Health Products Regulatory Authority. Only agencies, institutions, organizations and or individuals designated and or approved by the Ministry of Health shall provide EPI services in order to guarantee equitable access to quality vaccines.

2.1.2.2 The EPI Structure and Related Functions

For proper and effective management and delivery of immunization services to all eligible persons in Liberia, the EPI programme has been carefully structured so as to meet their needs.

There are four (4) levels constituting the EPI structure:

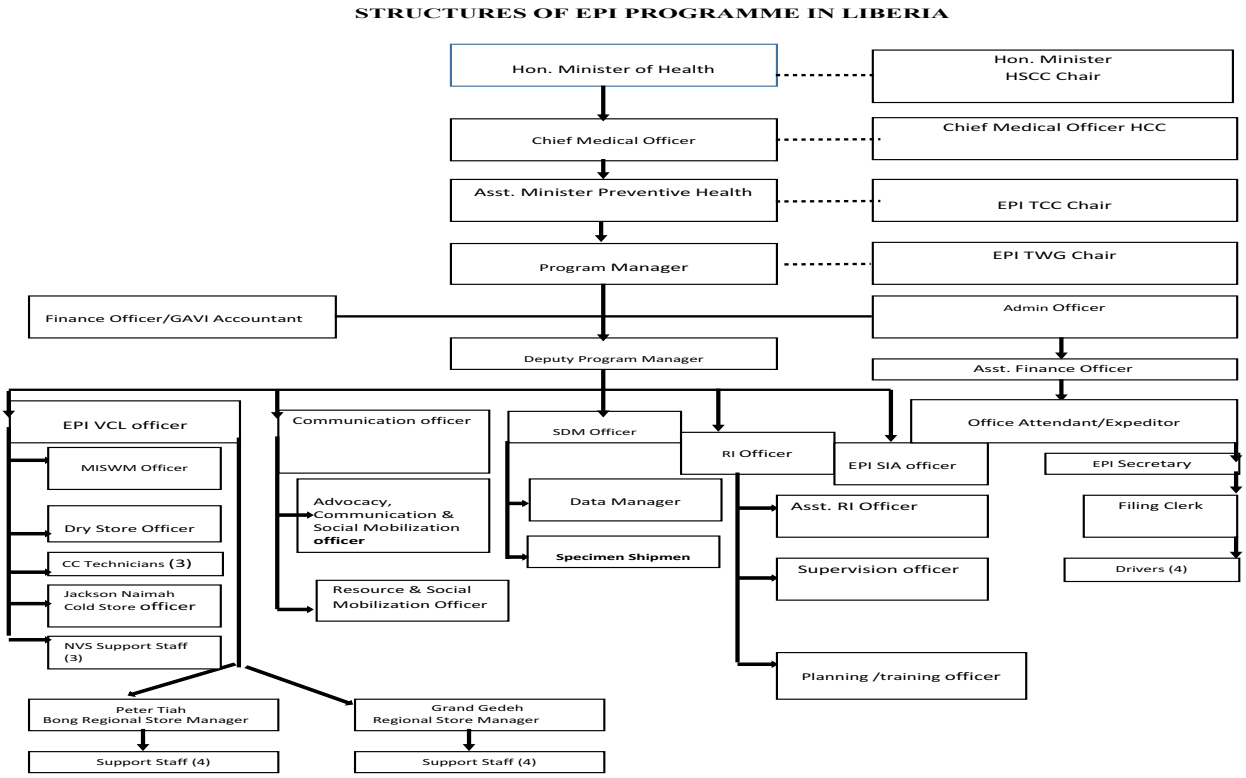
1. National level
2. County level

3. District & Health facility Levels

National level

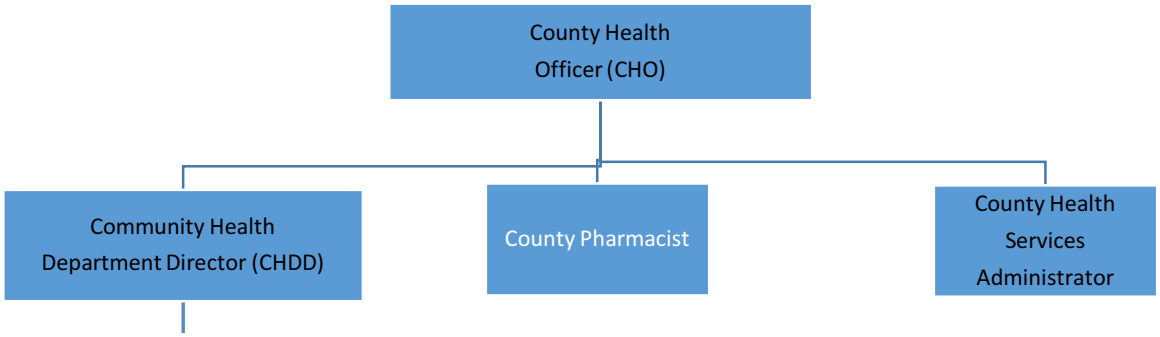
Under the national level structure are the following positions:

A National EPI Manager who oversees and coordinates all EPI related activities in health institutions designated by the MOH to carry out such activities in the country. The National EPI Manager reports to the Assistant Minister for Preventive Health Services. Other members under the National Level structure of EPI programme include: Deputy Manager, Data Manager, Communications, Surveillance, Routine Immunization, SIAs and Logistics Officers respectively.



County level:

At the county level, the County Health Officer (CHO) oversees the planning, implementation and evaluation of immunization activities. In addition, there is a county Child Survival Officer who is responsible for the day-to-day EPI operations and a surveillance officer who is responsible for Vaccine Preventable and priority Diseases surveillance.



District & Health Facility Levels:

At this level, there are District Health Officers (DHOs) who are polyvalent in function and oversee EPI activities. At the facility level, the Vaccinator is responsible for the day to day EPI services under the supervision of the officer in charge (OIC) of clinic. In addition, there are 88 District Surveillance officers, trained in routine immunization and disease surveillance.

SITUATIONAL ANALYSIS

3.1 The Socio-Economic Situation

Liberia, a country located in West Africa, borders with Sierra Leone to its west, Guinea to its north and Ivory Coast to its east. It covers an area of 111,369 square kilometers, with an estimated 4.7 million populations (NHPC, 2008). it is further divided into 5 regions, 15 administrative counties and 92 health districts. Populations ranging from 57,913 in Grand Kru County to 1,118,241 in Montserrado County.

Liberia's economy is still struggling to recover fully from the effects of multiple shocks in recent years: namely, Ebola virus disease (EVD) outbreaks, collapse of commodities prices, UNMIL withdrawal and the perception of risk associated with the political transition in January 2018.

Liberia is a low-income country with an estimated GDP per capita of USD 360 in 2017 with an estimated rise of 3.0% GDP growth rate in 2018. it was estimated to have declined to 2.5% or less by the end of 2014 due to the EVD crisis according to World Bank 2017 update.

Despite the economic growth of the country, more than half of the population (50.9 percent) lives below the poverty line on less than US$1.30 per day (Liberia Household Income and Expenditure Survey, 2016) with Human Development Index (HDI), composite score as measured by the United Nations Development Program (UNDP), at 0.427 (UNDP), 2015.

The Ebola virus disease (EVD) exposed the weaknesses in the health system and implementation of the ten (10) years National Health Policy (2011-2021) including the formulation of a health sector recovery and investment plan (2011-2021) that serves as a roadmap for future implementation of the health sector. The Investment Plan for Building a Resilient Health System complements the National Health Policy and Plan which has nine investment areas (fit for purpose health workforce, community engagement, leadership and governance, health information system, quality health service delivery, medicines and technology, emergency preparedness and response, health financing and health infrastructure) that enable the health sector to become responsive and proactive in dealing with future outbreaks and public health emergencies.

According to the SARA report 2018, there are 831 health facilities across the 15 counties. Public health facilities accounts for fifty-five percent (n=457), while private account for forty-five percent

(n=374). Currently, seventy-five percent (n=622) of functional health facilities (207 private and 415 public) are providing routine immunization while a total of 599 reporting through the DHIS 2. The average health facility \"'density per 10,000 population stands at 1.95, which is less than WHO recommended rate of 2.0. However, forty-six percent (n=7) of the fifteen counties are at 1 health facility per 10,000 population.

Despite these strides, twenty-nine percent (n=1.2 million) of the country's population live beyond 5 kilometers (more than one hour walk) to the nearest health facility. Therefore, it is critical to have diversified strategies/approaches in reaching the underserved, unreached and hard-to-reach population. These efforts will eventually bridge immunization inequities and reduce significantly attributable vaccine preventable diseases mobility and mortality.

The Demographic survey of 2013 provides for the under-5 mortality rate in Liberia of 94 deaths per 1,000 live births. The infant mortality rate, or deaths before the first birthday, is 54 deaths per 1,000 live births, and newborn mortality rate is 26 per 1,000 live births, while maternal mortality ratio is 1072 per 100,000 live births (DHS 2013)

The proportions of health facilities in Liberia consist of 5% hospitals, 7% health centers and 88% are clinics offering a range of services across the health sector. According to the Health Workforce Census Report 2016, there are at least 18 health-training institutions in Liberia with over 44% in Montserrado.

Immunization Context

The immunization program has made significant stride towards achieving coverage targets, improving performance, expanding the immunization schedule and improving access to immunization services in a sustainable way through 2018. With the support of Immunization partners, the EPI programme has made substantial progress in the following areas:

Service Delivery: Service delivery within the health sector is organized at three main levels; primary, secondary and tertiary levels. The quality of service delivery is ensured at the various levels. A number of innovative strategies are used to deliver immunization services. Static immunization is the main service delivery strategy. Every health facility has a static clinic responsible for daily routine immunizations. The increasing availability of such clinics in the country has made access to routine immunization easier. Outreach immunization services are organized to reach children in communities where static clinics are not available. The outreach programme has contributed immensely towards bridging the gap between communities with health facilities and those who do not have but needs to be more robust to reach out to specific group.

Since 2001, Liberia has introduced several new vaccines into routine immunization services. These vaccines include but limited to the following antigens:

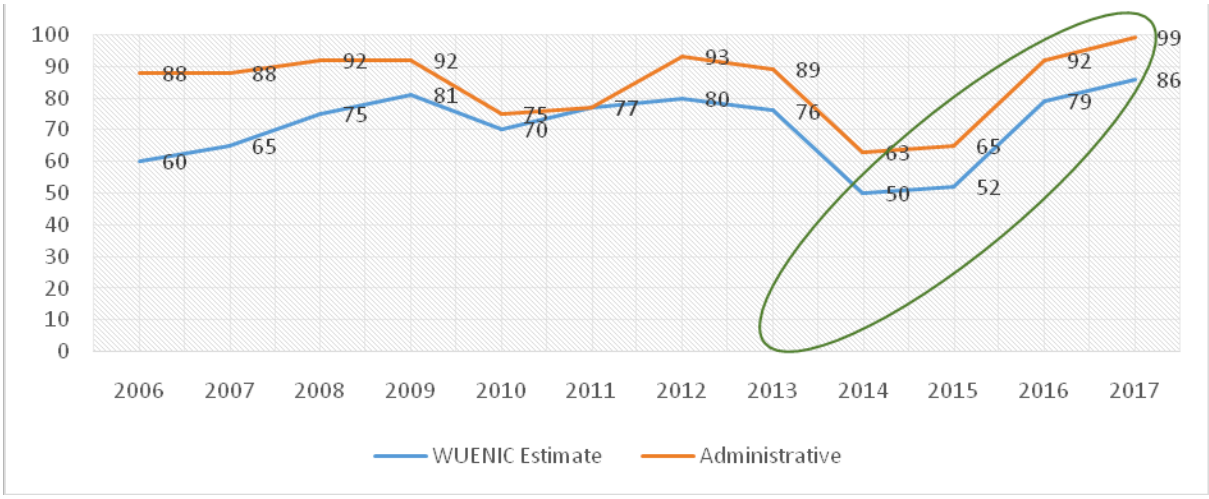
I. Yellow Fever (2001)
II. Penta (2008)
III. PCV (2014)
IV. Rotavirus Vaccine (2016)

V. HPV Demonstration (2016)
VI. IPV (2017)
VII. MCV2 scheduled for 2019
VIII. HPV scheduled for 2019.

PERFORMANCE OF THE IMMUNISATION PROGRAMME

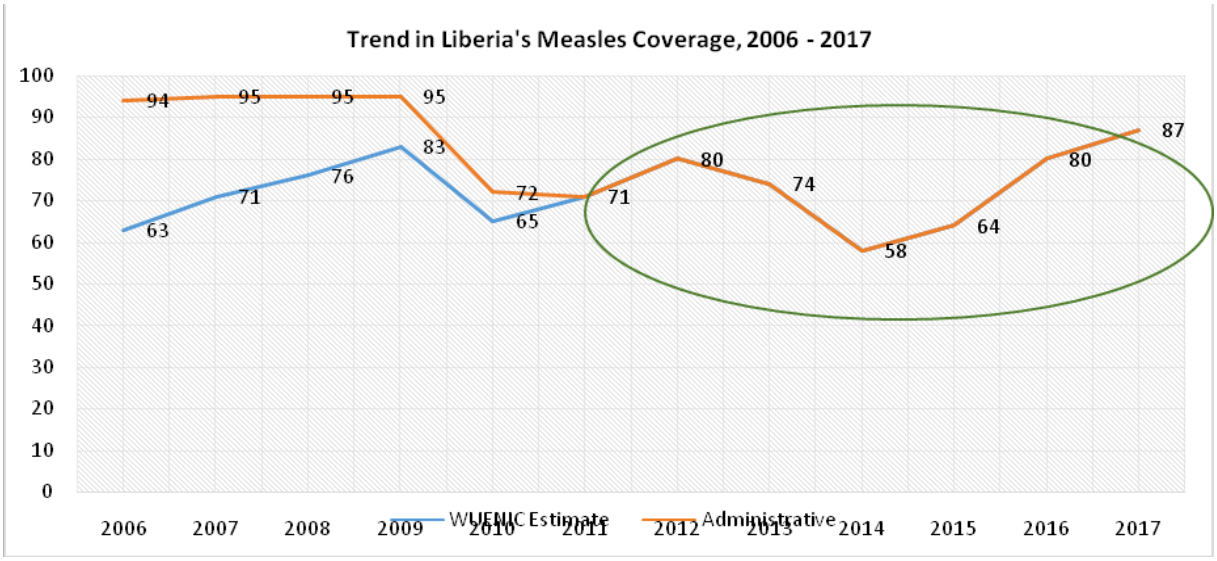
The below figures clearly demonstrate the progress made by the immunization programme especially post-ebola. Please see details below:

Fig. 1.0 Trend in Penta 3 Coverage from 2006-2017



Analysis of 2017 immunization data revealed that tremendous progress has been made in the attainment of immunization coverage rates at all levels. Immunization coverage trend over the past six years show that all antigens made significant progress especially the third dose of Pentavalent vaccine (Penta 3) from 52% to 79% (WUENIC, 2016) and 86% (WUENIC, 2017).

Fig. 2.0 Trend in MCV1 Coverage from 2006-2017



The above chart shows tremendous improvement in the coverage for MCV1 especially post-ebola as evident by the agreement between WUENIC and Administrative data from 2011 – 2017.

Table. Penta 3 &MCV 1 coverage trend by county 2016-2017

The above figure shows 13 of the 15 counties attained the Penta 3 national target of 80% and above while Grand Cape and Rivercess underperformed. On the other hand, measles performance is attained in 10 of the 15 counties while five counties inclusive of Grand Cape Mount underperformed.

SIA PERFORMANCE OVER THE YEARS

In confirmative to the Global Polio Eradication Initiative and Endgame strategic plan, Liberia has conducted 16 rounds of polio NIDs since 2013 targeting children age 0-59 months and attained a mean coverage above 95% according to the independent monitoring results. The campaigns were regionally synchronized and conducted as nationwide and sub-national campaigns. The campaigns were either conducted as only polio or integrated with Vit-A and Mebendazole. Similarly, two rounds of measles SIA were conducted in 2015 and 2018; targeting children age 6-59 months. The average measles coverage achieved from the independent monitoring results during these two rounds was more than 95%.

Summary of Supplemental Immunization Activities 2013-2018

Antigen				Independent monitor Performances (%)												
	2013			2015			2016				2017				2018	
	R1	R2	R3	R1	R2	R3	R 1	R2	R3	R4	R 1	R2	R3	*R4	R 1	*R2

Polio	95	95	97	91	91	91	95	95	96	96	97	97.4	NA	NA	97	93
Measles				98%										97%		

* Sub-NIDs

Health Communication

Health communication is a process through which actions are stimulated to increase immunization uptake and influence decisions within political and economic institutions, social systems, and key stake holders to ensure sustainable immunization financing. The strategies include; advocacy, social mobilization, community and media engagement and messaging.

Since the ebb of the EVD crisis, Liberia developed immunization specific communication strategic plan in 2010, revised 2018 and pending validation and dissemination. The revised plan was modelled based on empirical findings from the Knowledge Attitudes Practices of parents'/caregivers study on Immunization in Liberia 2017 and the national communication strategic plan 2016.

Routine and SIAs messages are developed but centered around routine immunization schedule and antigen specific for SIAs. However, the KAP studies highlights critical gaps in immunization communication including

1. limited knowledge and messaging in disease specific antigen
2. The absence of male involvement in immunization
3. The existing trusted source of immunization information is predominantly radio, though coverage is limited to rural terrains
4. Poor client and service provider interaction on relevant information sharing; return dates, knowledge on vaccine preventable diseases.
5. Increasing fear of multiple injection related pain

Other vaccines related issues identified include: non-adherence to multi-dose vial policy, cultural and religious myth especially during SIAs.

Other areas to explore include; media engagement (e.g. Facebook and Twitter, mHero, MOH website, print media, cooperate social mobilzation targeting casstte boys, motorcyclist, etc.)

What do we intend to achieve?

Health communication for immunization will remodel its communication strategy to enhance community ownership and network with partners to address existing identified gaps.

Vaccines, Logistics, Cold Chain and Waste Management

1. Cold Chain Requirement

gains made in addressing cold chain in terms of sufficient storage capacity and effective vaccine distribution at both facility and stores levels in the area immunization service delivery cannot be

overemphasized. Over the years, cold chain capacity was expanded with additional cold rooms and fridges to provide adequate storage space and distribution to facilities. Currently, at the national level there is a combined walk-in-cold room and walk-in- freezer room with the gross storage capacity 80m3 and 25m respectfully. This capacity is not adequate to accommodate the vaccine requirements for 2019 to 2021. However, the Government of Liberia has already constructed three (3) compartments unit with a gross storage capacity of walk-in-freezer room 115m2, walk-in- cold room 600m2 and a pre-packaging 75m2. The national cold store will transition to the newly constructed medical store by 2019.

2.Cold Chain Capacity at Regional Level

The country embarked on cold chain expansion at the regional level in Bong and Grand Gedeh Counties following the EVM assessment 2015. The gross storage capacity of Walk-in cold rooms is 40m3. The Grand Gedeh store is fully operationalized and awaiting sustainable fuel support before transferring the regional bundled vaccines. The temperature mapping of the cold room has been satisfactorily completed.

*3.*Cold Chain Capacity county and health facility Levels

At county level 14 out 15 county depots have adequate positive storage capacity. Montserrado does not have its own vaccine depot. It is integrated with National store. the total of 535 refrigerators has been installed in health facilities across the 15 counties.

4.Dry Storage

There is adequate dry storage capacity at both national and regional levels. There is storage gap at both county and facility levels.

National level forecast, procurement, manage and distribution to lower levels while regional level received management and further distribute to county level and subsequently to the health facilities by the counties.

during the period under review the program has trained 30 county level staff in Vaccine and cold chain management. despite the need for training in vaccines and cold chain management, cold chain equipment management and logistics stock management Tools. The regional and county depots are supplied quarterly from the national levels

Under the cold chain equipment optimization platform (CCEOP) for year one (2017), 108 Solar Direct Drive, 32 Ice-line Refrigerators and 900 Fridge Tags have been procured and installed across fifteen counties.

According to the 2018 Cold Chain Equipment Assessment, the total functional cold chain equipment installed at service delivery points is 488 and 47 nonfunctional. However, thirty percent (n=150) of the functional cold chain equipment have exceeded five years since installations. This data shows that 134 of the functional health facilities providing routine immunization are without cold chain equipment while 150 aging. With this current situation, there is an approval of 139 Cold

Chain Equipment under the GAVI CCEOP window. This action is directed at addressing replacement of 150 aging Cold Chain Equipment but not the total deficit of 284 in existing health facilities providing routine services. This does not also account for the newly constructed health facilities and those not providing services at the moment See table below:

Table 1. Storage capacity for vaccines at different levels of the health system in Liberia.

Storage level	Storage capacity
National	At old location (JFK compound) Cold room: 65 m^3 Freezer room: 25 m^3 New store cold room at Caldwell: 593 m^3 Freezer room: 113 m^3
Regional	2 regional stores: 40 m^3 each
Health facility	500+ health facilities with cold chain equipment (mostly: 36 liters of net vaccine storage capacity)

The table below provides details on the available positive storage capacities at all levels.

Table 2. Positive storage Capacity at subnational level

		Additional cold chain storage capacity refrigeration					
Level	**Name of store**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**
Region	Regional Store-Bong	- 3,213 litr	- 2,458 litr	- 2,318 litr	- 2,154 litr	- 1,994 litr	- 1,878 litr
Region	Regional Store-Grand Gedeh	- 4,656 litr	- 4,312 litr	- 4,248 litr	- 4,175 litr	- 4,101 litr	- 4,047 litr
County	Bomi	- 438 litr	- 412 litr	- 407 litr	- 401 litr	- 395 litr	- 391 litr

County	Gbarpolu	- 485 litr	- 459 litr	- 453 litr	- 448 litr	- 442 litr	- 438 litr
County	Grand Bassa	- 765 litr	- 695 litr	- 683 litr	- 668 litr	- 653 litr	- 642 litr
County	Grand Cape Mt	- 391 litr	- 351 litr	- 343 litr	- 335 litr	- 327 litr	- 320 litr
County	Rivercess	- 924 litr	- 902 litr	- 897 litr	- 892 litr	- 887 litr	- 884 litr
County	Montserrado	- 598 litr	- 248 litr	- 183 litr	- 108 litr	- 34 litr	21 litr
County	Margibi	- 667 litr	- 601 litr	- 588 litr	- 574 litr	- 561 litr	- 550 litr
County	Bong	- 926 litr	- 822 litr	- 802 litr	- 780 litr	- 758 litr	- 741 litr
County	Lofa	- 909 litr	- 822 litr	- 805 litr	- 787 litr	- 768 litr	- 755 litr
County	Nimba	- 1,040 litr	- 895 litr	- 868 litr	- 837 litr	- 807 litr	- 784 litr
County	Grand Gedeh	- 686 litr	- 647 litr	- 640 litr	- 631 litr	- 623 litr	- 617 litr
County	Grand Kru	- 402 litr	- 384 litr	- 380 litr	- 376 litr	- 372 litr	- 370 litr
County	Maryland	- 532 litr	- 489 litr	- 481 litr	- 472 litr	- 463 litr	- 457 litr
County	River Gee	- 608 litr	- 587 litr	- 583 litr	- 578 litr	- 574 litr	- 571 litr
County	Sinoe	- 674 litr	- 642 litr	- 636 litr	- 629 litr	- 622 litr	- 617 litr

After completion of construction, a temperature mapping study will be conducted in line with WHO protocol. The government, with support from partners, is expanding storage capacity through the installation of solar refrigerators in all health facilities that provide routine immunization services. Assessment of cold chain capacity at the national and subnational levels has shown storage capacity to be sufficient, especially with the operationalization of the two regional stores (located in Bong and Grand Gedeh Counties). Furthermore, counties are being

equipped with additional ice-lined refrigerators to address the issue of cold chain capacity at the county level. Finally, the Cold Chain Equipment Optimization Platform (CCEOP) through Gavi allows the procurement of balance 139 pieces of new-generation SDD cold chain equipment to support cold chain expansion at the health facility level and replace aging cold chain equipment in 2019 -2021.

INJECTION SAFETY & WASTE MANAGEMENT

In an effort to improve the quality of immunization services without causing or posing harm to the patient, health care worker, the community and the environment are protected from sharp and other medical waste, the Expanded Programme on Immunization (EPI) has adopted the WHO "First, do no harm" strategy. This led to the introduction of the Injection Safety, the "bundling" principle. This necessitated the procurement and distribution of vaccines with auto-disable (AD) syringes and safety boxes for the collection of sharps. The final disposal of used syringes and sharps is done by incineration where an incinerator is available. Where there is no incinerator, the used safety boxes are stored in a safe place and later transported to a nearby facility for incineration. In the areas that are difficult to reach/challenging, open pit burning and burying method is use for disposal.

Integrated Disease Surveillance Response (IDSR) System

Liberia implements the integrated disease surveillance and response (IDSR) that include the surveillance for vaccines preventable diseases (VPDs) at all levels. of recent, adverse events following immunization (AEFI) has become a major concern for immunization safety and service delivery. However, sentinel surveillance for rota and influenza were established 2013 and 2017 respectively. Moreover, the MOH is collaborating with NPHIL through the tiers of the Health system to detect, report and response to vaccines preventable diseases outbreaks and emergencies. Additionally, a innovative report and investigation mechanism known as the Auto Visual Detection of AFP and Report (AVADAR) has been initiated in Montserrado County to as a key complementing strategy in an effort toward the Global Polio Eradication Initiative and the Polio Endgame.

Vaccine Preventable diseases burdens

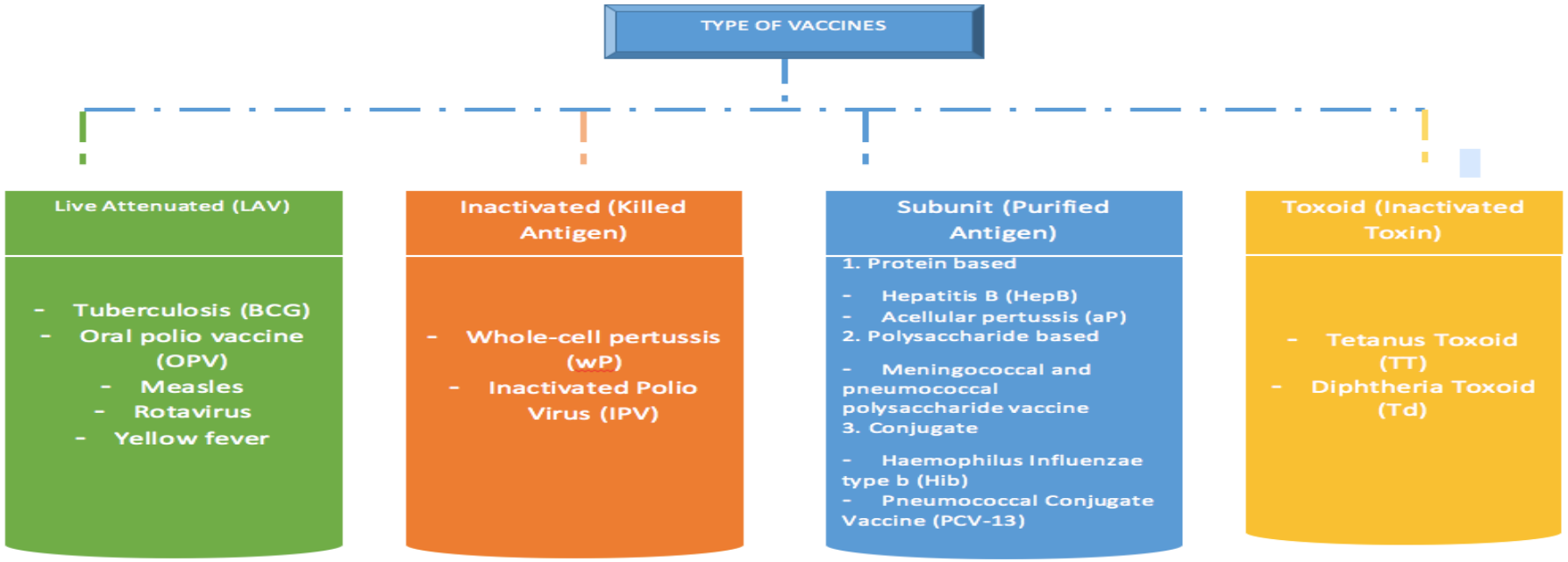
Measles has been a major VPD that has claimed the concern of the National EPI, the MOH and partners. As a country, there is only one dose measles vaccines administered at age nine months unlike other countries with at least two doses which promotes vaccine efficacy and herd immunity. For the last two years (2017& 2018) about four thousand cases have been identified in the country and at least 25% confirmed positive. The EPI program of the MoH in collaboration with partners conducted a national SIA campaign (a three Phases approach) for measles taking into account the incidence rate across the country. There is an approval (GAVI) for measles second dose in the second year of life. Also, many measles cases have been co-tested for rubella of which there were a number of positive cases

Case based surveillance for measles, acute flaccid paralysis and other VPDs cases have was set up in 2005 under the IDSR. one case of yellow fever was reported in week 44 of 2018. Since 2018 about more the 25 outbreaks has been reported for measles and one for yellow fever. Challenges with case classification and status of vaccination in investigation is critical. With respect to AFP surveillance the South eastern regions are of concern with especially regarding stool adequacy and timely investigation. For sentinel surveillance activities, a total of 140 rota virus samples have been transported to the Noguchi Memorial institute for medical research for laboratory analysis and a total of 10 samples being confirmed.

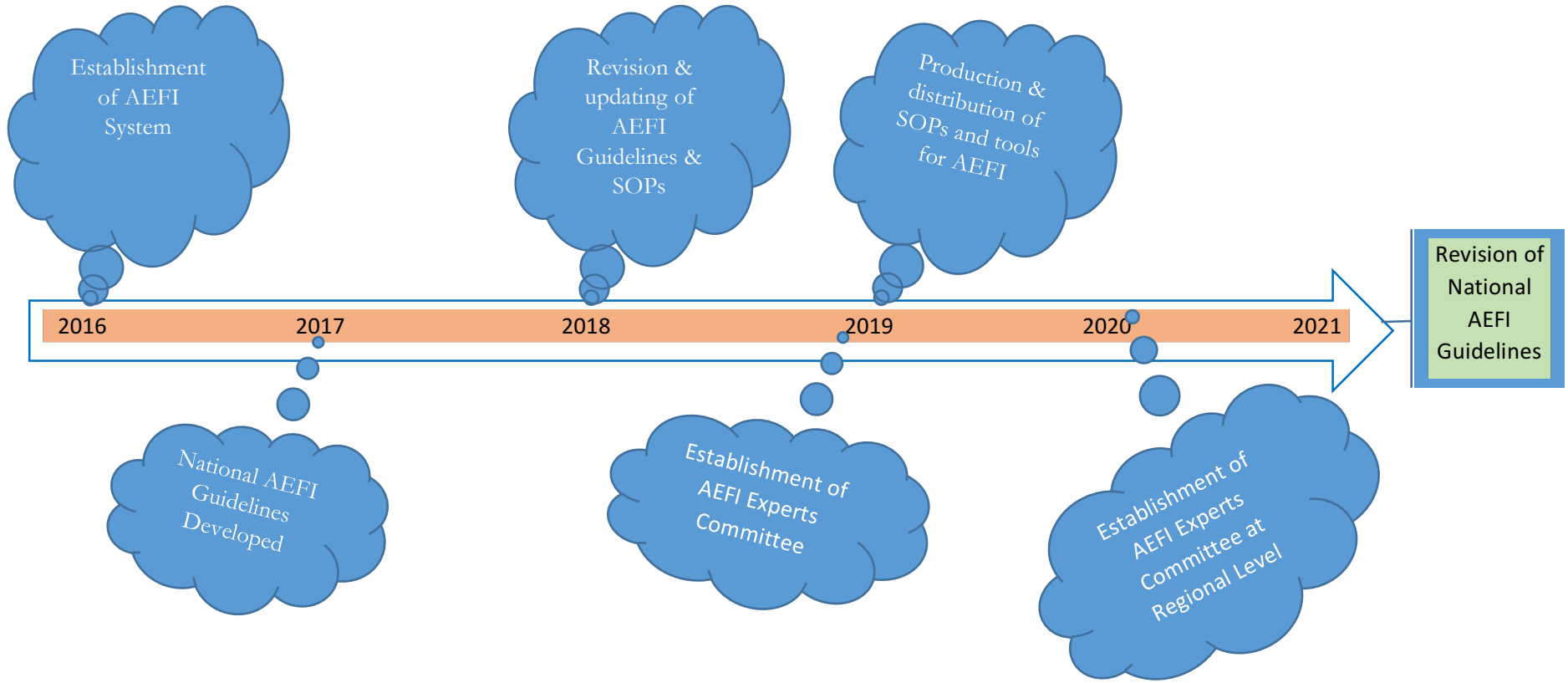
SURVEILLANCE AND ADVERSE EVENT FOLLOWING IMMUNIZATION (AEFI)

OVERVIEW OF AEFI SURVEILLANCE & MONITORING SYSTEM

The goal of Liberia's Expanded Programme on Immunization is to reduce the morbidity and mortality of vaccines preventable diseases in children 0-23 months as well as women of child bearing age (WCBA). By this, the individual and population are protected against communicable diseases that are high infectious and has the proclivity of cause outbreak(s) and taking away lives. Though the vaccines used in country are safe and effective. However, like all pharmaceutical products, vaccines are not entirely free of adverse reaction and as such you need a system that monitors the entire vaccines administration cycle. AEFI surveillance and monitoring program clearly demonstrates how the country intents in ensuring that the quality of vaccines deliver during immunization services are of the highest quality, safety and ensure confidence. Liberia's national AEFI guidelines and SOP were revised in 2018. The guidelines provide information to health care providers (e.g. Nurses, Certified Mid-wives, Vaccinators, etc.) and programme managers at national, state, district, block and primary health care levels for establishing a responsive and effective AEFI surveillance and monitoring system. The national AEFI guidelines provide complete guidance and other details for reporting, investigating and conducting the causality assessment of cases reported as AEFIs.



MILESTONES FOR AEFI PROGRAMME IMPLEMENTATION IN LIBERIA



AEFI REPORTING FLOW CHART

KEY AREAS FOR AEFI SUPPORT

- Strengthening AEFI Committees
- Monitoring & Supervision
- Strengthen investigation, reporting and response
- Strengthen Laboratory capabilities (i.e. vaccine efficacy)

In addition to new vaccine support, the country has also received Gavi funds for health systems strengthening covering the period 2017 - 2021. The Ministry of Health in consultation with the HSCC provide oversight function on the management of the HSS grant.

To date, the Government provides Co-financing for vaccines procurement, monthly salaries and incentives for public health service providers and infrastructure for immunization services including distribution and management of vaccines. WHO, UNICEF and USAID support capacity development, supply chain management, social mobilization and health promotion. The Government is committed to supporting the national immunization program as evidenced by increasing budgetary allocation (from US$50,000 in 2010 to US$650,000 in 2017) and Co-financing contributions as well as relative increase in staff salaries. In addition, the budgetary allocation for FY 20018/2019 and FY 2019/2020 is US$ 600,000.00 and US$ 600,000.00 respectively. Reviews and evaluation were strengthened and intensified, as plans and regular supportive supervision were conducted at all levels aimed at optimizing immunization service delivery.

Human Resource for Health (HRH)

The Ministry of Health (MOH) along with her partners conducted activities aimed at rebuilding a resilient health system. These activities include but are not limited to:

Health Workforce Census to determine the actual human resources (HR) strength available to the delivery of essential health services in 2016 as well as determining their payroll status (GoL Basic Salary). The findings of the health workforce census showed a total of 16,064 health workers of which 59% are on the government payroll. The government health workforce comprised of 234 public service physicians, 518 physician assistants, 3,377 nurses and 927 certified midwives and the remaining composed of other health service cadre. In addition, there are approximately 3,727 community health volunteers who provide basic services in the community. See table below for details per county.

Health Workforce distribution per county in Liberia *(health workforce census 2016)*

Professional Details	Grand Total	Bomi	Bong	Gbarpolu	Grand Bassa	Grand Cape Mount	Grand Gedeh	Grand Kru	Lofa	Margibi	Maryland	Montserrado	Nimba	River Gee	Rivercess	Sinoe
Administrators	1,404	33	93	21	47	48	36	22	108	78	53	638	137	15	30	45
Administrative Support	4,311	129	320	73	184	130	217	103	384	228	131	1,564	525	114	85	124
Clinical Support	3,601	128	220	49	111	99	177	71	269	163	128	1,502	416	83	48	137
EHT	285	9	14	6	15	7	20	2	15	16	7	117	40	4	5	8
Dentist	14	0	0	0	0	0	0	0	2	0	0	11	1	0	0	0
Lab Technician	300	6	35	2	8	6	7	4	12	22	11	139	31	6	3	8
Midwife	927	32	110	25	33	34	35	24	97	40	35	316	79	17	20	30
Registered Nurse	3,077	111	286	55	143	77	77	36	245	162	81	1,270	328	59	51	96
Pharmacist	109	4	5	0	4	3	2	2	5	13	2	54	9	2	3	1
Pharmacy Workers	962	31	78	17	38	38	42	17	75	48	38	377	84	15	23	41
Physician	234	3	20	3	7	4	3	2	9	13	6	128	30	3	1	2
Physician Assistant	518	13	19	9	18	33	23	15	38	24	14	209	49	15	20	19
Public Health Specialist	68	0	1	0	4	2	0	0	0	1	1	56	2	0	0	1
Social Workers	254	5	14	2	3	3	11	2	12	32	6	135	21	2	1	5
Total	16,064	504	1,215	262	615	484	650	300	1,271	840	513	6,516	1,752	335	290	517

[1] WHO/UNICEF Estimates
[1] Liberia Demography and Health Survey

4.0 NATIONAL OBJECTIVES AND MILESTONES

The strategic objective for 2016-2020, is to increase national Pentavalent vaccine third dose (Penta 3) coverage from 71.4% (coverage survey data 2013) to at least 90% nationally and at least 80% coverage in all counties by the end of 2020.

Table: 8 **Global goals, regional goals, national objectives and milestones**

Global goals (until 2020)	**Regional goals (until 2020)**	**National objectives based on global and regional goals**	**Milestones**
Coverage[1] 1. By 2020 or sooner all countries will have routine immunization coverage at 90% nationally with at least	✚ To improve immunization coverage beyond the current levels ✚ DTP vaccine coverage to reach 90% region-wide by the end of 2020 ✚ All countries to introduce PCV by the end of 2020	✚ To achieve Penta 3/PCV3 coverage of 90% nationally with at least 80% coverage in all counties by 2020 ✚	**2016:** 75% national coverage by WUENIC and 70% of Counties (districts) achieve Penta 3/PCV3 coverage of ≥ 80% . **2017:** 80% national coverage by WUENIC and 75% counties achieve Penta 3/PCV3 coverage of ≥ 80%

80% coverage in every district	✚ At least 37 countries to introduce the rotavirus vaccine by 2020 ✚ At least 35 countries to introduce HPV by the end of 2020 ✚ At least 25 countries to introduce a birth dose of Hep B by the end of 2020		**2018:** 85% national coverage WUENIC and 80% counties achieve Penta 3/PCV3 coverage of ≥ 80% **2019:** 88% national coverage by survey and 90 % counties achieve Penta 3/PCV3 coverage of ≥ 80% **2020:** 90% national coverage by survey and all counties achieve Penta 3/ PCV3 coverage of ≥ 80%
Polio 2. By 2020, the World will be certified polio-free	✚ To complete interruption of poliovirus transmission and ensure virus containment ✚ All countries to interrupt transmission of wild poliovirus by 2018 ✚ All OPV-using countries to introduce at least one dose of inactivated polio vaccine by 2020 ✚ All polioviruses to be laboratory contained and the Region certified polio free by the end of 2018. ✚ A regional polio legacy plan to be finalized by the end of 2019	Achieve and Sustain interruption of wild polio virus transmission and containment by 2016 and beyond Achieve 95% of OPV coverage in Polio SIAs assessed by independent monitoring Switch from tOPV to bOPV nationwide by end of 2016 Introduce IPV into routine immunization by 2020	**2016: Achieve** 75% national coverage of OPV 3 by WUENIC and 70% Counties (districts) achieve coverage of ≥ 80% 100% switch of tOPV to bOPV conducted in all counties - **2017:** 80% national coverage by WUENIC and 75% counties achieve OPV3 coverage of ≥80% **2018:** 85% national coverage by WUENIC and 80% counties achieve OPV3 coverage of ≥80% - National IPV coverage of at least 70% of OPV 1 coverage **2019:** 88% national coverage by survey and 90 % counties achieve OPV3/IPV coverage of ≥ 80% **2020:** 90% national coverage by survey and all counties achieve OPV3/IPV coverage of ≥ 80%

Measles[2] 3. 90% reduction in infant mortality by 2020 compared to 2000	▪ To attain the elimination of measles and make progress in the elimination of rubella and congenital rubella syndrome ▪ All countries to achieve an incidence of confirmed measles of less than 1 case per million population by 2020 ▪ MCV1 coverage to be at least 95% at the national and district levels and SIA coverage to be 95% in all districts ▪ At least 25 countries to introduce rubella-containing vaccine by 2020	▪ Measles mortality reduced by 90% by 2020 **2.** ▪ Achieve MCV1 coverage of at least 95% at national and 85% at counties levels by 2020 **3.** ▪ Introduce MCV2 nationwide by 2019 ▪ **Achieve at least 95% of Measles SIA coverage at national and county levels**	**2016:** 100% investigation (case base) of notified suspected cases and achieve 75% measles immunization coverage at national level by WUENIC. **2017:** 100% investigation (case base) of notified suspected cases and sustain 80% measles immunization coverage at national level by WUENIC **2018:** 100% investigation (case base) of notified suspected cases and achieve 85% measles immunization coverage at national level by WUENIC. At least 95% coverage in Measles catch up campaign in all counties and at national level **2019:** 100% investigation of notified suspected cases and achieve 90% measles immunization coverage at national level by survey. MCV 2 introduced into routine immunization **2020:** 100% investigation (Case base) of notified suspected cases and sustain 95% measles immunization coverage at national level byWUENIC. MCV 2 coverage of 70% of MCV1 immunized at national and county levels - .
NT[1] 4. Elimination maintained in every	▪ To attain and maintain elimination/control of other vaccine-	▪ Achieve and maintain MNT elimination status by 2020 ▪	**2016: 8**0% of counties report <1 NT/1,000 live births; 85% coverage of TT2+Pregnant at national level by administrative data

district by 2020	preventable diseases - All countries to attain and validate elimination of maternal and neonatal tetanus by 2020 - All high-risk countries to attain yellow fever immunization coverage of 90% or higher by 2020 - All countries within the meningitis belt to introduce Men-AfriVac TM through campaigns, and 15 of them to have the vaccine in routine immunization by 2020 - Sero-prevalence of HbsAg among children younger than 5 years to be less than 2% by 2020		**2017:** 85% of counties report <1 NT/1,000 live births; 85% coverage at national level by administrative data **2018:** 100% of counties report <1 NT/1,000 live births; Introduce TT vaccines in school health programmes. 88 percent TT2+ Pregnant coverage at national level by administrative data **2019:** 100% of counties report <1 NT/1,000 live births; 89% Td coverage at national level by survey **2020:** 100% of counties report <1 NT/1,000 live births; 90%Td coverage at national level by administrative data.
5. New vaccines introduction: — **All low-income and middle-income countries have introduced one or more new or underutilized vaccine**	**All low-income and middle-income countries have introduced one or more new or underutilized vaccine**	Introduce new vaccines (Rota, HPV and TCV) into routine immunization by 2020.	**2016:** 75% Rota 2 national coverage by WUENIC and 70% Counties (districts) achieve Rota 2 coverage of ≥ 80% **2017:** 80% national coverage by WUENIC and 75% counties achieve Rota 2 coverage of ≥ 80% **2018:** 85% national coverage by WUENIC and 80% counties achieve Rota 2 coverage of ≥ 80% **2019:** 88% national coverage by survey and 85% counties

			achieve Rota 2 coverage of ≥ 80% **2020:** 90% national coverage by WUENIC and 90% counties achieve Rota 2 coverage of ≥ 80%.
6. Human Papillomavirus vaccine		Introduce Human Papillomavirus vaccine into RI by 2019	**2016:** Introduce first and second dose of HPV round 1 and achieve at least 85% coverage… **2017:** Deliver first dose of HPV round 2 and achieve 85% administrative coverage Also, 80% counties achieve HPV coverage of ≥ 80% - 2018: Application for national roll out of HPV **2019:** Conduct/implement national roll out of HPV **2020:** 80% national HPV coverage by administrative data and 90% counties achieve HPV coverage of ≥ 80%
7. Typhoid Conjugate Vaccine (TCV)		Introduce TCV Into routine immunization by 2020	**2018:Data collected and Compiled for TCV application** **2019: TCV application, submitted and approved.** **2020: TCV Introduced into RI with at least 80% Coverage**
8. Yellow fever		Maintain YF coverage as measles coverage by 2020	**2016:** 100% investigation of notified suspected cases and achieve 75% YF coverage at national level by WUENIC. **2017:** 100% investigation of notified suspected cases and sustain 75% YF coverage at national level by WUENIC **2018:** 100% investigation of notified suspected cases and

			achieve 80% YF coverage at national level by WUENIC. **2019:** 100% investigation of notified suspected cases and achieve 85% YF coverage at national level by survey. **2020:** 100% investigation of notified suspected cases and sustain 85% YF coverage at national level by WUENIC
9.			
10. Immunization Systems Strengthening	- At least 90% of countries will have adopted and implemented internationally approved technologies and systems for waste management - At least 80% of countries will have functional regulatory authorities (NRAs) - At least 60% of countries will have revised their EPI pre-service curriculum. - All countries will have incorporated an immunization component into their national health promotion and communication plans. - All countries will have functional inter-agency coordination committees (ICCs) or equivalent coordination mechanism for immunization.	1. Coordination mechanism(HSCC) remains functional 2. Conduct Waste Management Assessment; Develop and implement national waste management plan for immunization 3. Strengthen integration between EPI and other programmes eg. FHD, HP, Nutrition, CHD, etc. 4. Reinforce communication for Immunization into national health promotion plan 5. Logistics and cold chain strengthened through the inplementation of the EVM improvement plan. 6. 7. Logistics and cold chain management strengthening at all levels 8. Immunization Supply chain system design 9.	**2016:** - 75% of planned Coordination meetings are held. - 75% of EPI service providers have access to safe waste disposal system - At least 80% of all short term activities within the EVM Improvement plan be implemented **2017:** - 80% of planned Coordination meetings are held. - 85% of EPI service providers have access to safe waste disposal system - At least 90% of all medium term activities within the EVM Improvement plan be implemented **2018:** - 85% of planned Coordination meetings are held. - 90% of EPI service providers have access to safe waste disposal system

		10. Immunization supply chain competency mapping and strengthening 11. 12. Cold chain equipment management 13. 14. Immunization Supply Chain data management 15.	- 100% of all medium term activities within the EVM Improvement plan be implemented - Costed EPI Communication Strategy and Plan developed and rolled out

11. Immunization Systems Strengthening			**2019:** - 90% of planned HSCC meetings are held. - 95% of EPI service providers have access to safe waste disposal system - At least 75% of all long term activities within the EVM Improvement plan are implemented - 100% EPI Communication strategy and plan integrated into the national health promotion plan - 80% of health facilities offering immunization services have immunization communication materials on display - internal EVM Assessnent conducted and at least 80% of improvement plan implemented . **2020:** - **At least** 95% of planned HSCC meetings are held. - 100% of EPI service providers have access to safe waste disposal system - 100% of all long term activities within the EVM Improvement plan be implemented - External EVM Assessment conducted and report available. - 100% health facilities offering immunization services have immunization

			communication materials on display
12. Linking Immunization to other	At least 80% of countries will have integrated other interventions into	All counties integrate high impact interventions such as Vit. A , Mebendazole,	2016: 70% of health facilities integrate high impact child health

interventions	routine immunization and SIA sessions for target population	growth monitoring into RI and SIAs	interventions during RI and SIAs 2017: 75% of health facilities integrate high impact child health interventions during RI and SIAs 2018: 80% of health facilities integrate high impact child health interventions during RI and SIAs 2019: 90% of health facilities integrate high impact child health interventions during RI and SIAs 2020: 100% of health facilities integrate high impact interventions during RI and SIAs

STRATEGIES PLANNED BY COMPONENT

Table :9A Service Delivery

Objective	Strategy	Key Activities
Achieve and Sustain interruption of wild polio virus transmission by 2018 and beyond	SIAs and Routine Immunization Active AFP Surveillance (Maintain certification level AFP surveillance indicators)	1. Conduct high impact polio NID evaluated with IM and LQAS - 3 rounds in 2016 - 4 rounds in 2017 - 2 rounds in 2018 (1 NID and 1 SNID) - 2 rounds in 2019 (1 NID and 1 SNID) 2. Integrate with other high impact interventions during RI and SIAs 3. Switch from tOPV to bOPV 4. Introduce IPV into RI 5. Conduct IPV catch-up campaign missed cohort 6. Conduct high quality active AFP case search 7. Introduce new technologies such as mobile data collection tools and

		GIS technologies to strengthen AFP surveillance 8. Introduce Environmental Surveillance 9. Documentation for certification and Polio Legacy 10. Strengthen National Polio Committees (NPEC, NCC, NTF) 11.
To achieve and sustain Penta 3 coverage of 90% nationally with at least 80% coverage in all Counties by 2020.	Routine immunization(health facilities, outreach and mobile sites)	Develop and monitor implementation of annual immunization plan of action at national level based on the cMYP 7. Develop RI microplan based on RED/ REC approach at county, district and health facility levels Conduct outreach in underserved and hard – to – reach areas Implement Urban immunization strategy 8. Conduct regular supportive supervision - Monthly supervision within the districts by counties Quarterly by national level 9.Conduct equity assessment and implement improvement plans 10.Conduct Missed Opportunities for Vaccination (MOV) assessment and implement improvement plans 11. Strengthen Defaulter tracking mechanisms in service delivery points 9. Conduct regular monitoring and evaluation - Quarterly by county

		- Bi-annually by national 10. Procure 22 vehicles for supervision (15 for CHTs; 2 regional cold stores; 5 national)
	Reinforce Vitamin A delivery within routine immunization in collaboration with Nutrition Division	
	AEFI Surveillance and Response system	Reactivate AEFI Committees at national and sub-national levels Develop AEFI guidelines and reporting tools Capacity building for health workers and surveillance personnel Integrate AEFI systems into national HMIS reporting system
Measles mortality reduced by 90% by 2020	Strengthen routine immunization, conduct high quality Measles SIAs, and integrate with high impact interventions (Vit A, Mebendazole and LLIN)	13. Conduct Measles follow up campaigns for <5s in 2015, 2018 & 2020 and evaluate with Post campaign coverage survey 14. Prompt investigation and response to all suspected and confirmed cases of outbreak 15. Joint planning with other Health Services Programmes (Malaria Control, Family Health, Nutrition, Health Promotion, etc.) 16. Distribution of Vit A, Mebendazole and LLIN with Measles campaigns

		Introduce MCV2 into RI
Sustain MNT elimination status by 2020	Strengthen routine immunization, conduct high quality SIAs, and integrate with high impact interventions, including clean delivery practices	17. MNT surveillance and response to outbreaks 18. Case in cases vestigation of suspected NNT 19. Conduct annual MNT risk assessment
Introduce new vaccines into RI by 2020	Switch from: tOPV to bOPV Penta 1 dose – 10 dose vial PCV 1 dose to 4dose vial	20. Implement the tOPV to bOPV switch plan at all levels
	Introduce new vaccines: Rotavirus vaccine IPV MCV2 HPV, Typhoid Conjugate Vaccine (TCV)	21. Develop and implement new vaccine introduction plans (Rota, IPV, MCV2, HPV, TCV) 22. Conduct post introduction evaluation (PIE)
	HPV Demonstration Project	23. Implement HPV Demonstration project 24. Conduct required evaluations for HPV Demo Project 25. Prepare and submit application on HPV national rollout
	Establish Immunization in second year of life (Y2L) platform	26. Establish Y2L working group and focal person 27. Collaborate with schools and parent teachers association (PTA) 28. Develop communication and advocacy tools

Objective	**Strategy**	**Key Activities**

Maintain YF coverage as Measles coverage by 2020	Sustain the use of Yellow Fever vaccine and reduce missed opportunities	29. Ensure availability of adequate quantities of Yellow Fever vaccine in all counties 30. Strengthen surveillance and response to outbreaks of YF.
		31.
Ensure proper wastes management system by 2020	Strengthen wastes management system at all levels	32. 33. Conduct waste management assessment 34. Develop and implement EPI waste management plan in all counties based on the assessment 35. Adopting appropriate waste management technology and system 36. Provide capacity building for service providers at all levels on waste management
		37.

Table : 9B Communication and advocacy for immunization

Objective	Strategy	Key Activities
To strengthen communication and social mobilization in support of EPI to achieve and sustain disease eradication, elimination, and control by 2016and beyond	Advocacy, social mobilization, community engagement, production and dissemination of messages	1. Develop communication for immunization strategy and plan 2. Develop/update, produce and disseminate communication materials on routine immunization and SIAs 3. Capacity building of CHCs, HFDCs, CHSS, CHAs and service providers on communication for immunization 4. Improve high level stakeholder engagement and partnership through advocacy (GOL, parliamentarians, civil society, private sector); identify and collaborate with immunization champions

Objective	Strategy	Key Activities
		5. Strengthen community engagement (community and religious leaders, women leaders) 6. Conduct KAP studies, Focus Group Discussions (FGDs) on immunization and implement improvement plans 7. Use of social media platforms, print and electronic mass media and traditional channels of communication (eg. Town criers, local vernaculars, etc) to improve demand for immunization services 8. Develop supportive supervision tools for C4I 9. Update EPI supportive supervision tools to include C4I indicators

Table : 9C Surveillance and outbreak response

Objective	Strategy	Key Activities
Strengthen surveillance for vaccine preventable diseases (VPD) to attain and sustain key surveillance indicators by 2016 and beyond	VPD surveillance embedded into Integrated Disease Surveillance Response (IDSR)	1. Conduct integrated active disease surveillance at all levels 2. Improve data sharing and feedback system at all levels. 3. Provide regular supplies and equipment to counties for case investigation 4. Conduct regular surveillance visits to priority sites. 5. Conduct training for all surveillance officers at all levels. 6. Provide operational support at all levels 7. Production of surveillance tools and training materials 8. Conduct community sensitization on VPD surveillance 9. Conduct sensitization for clinicians on VPD surveillance 10. Support outbreak investigation and response 11.

Objective	Strategy	Key Activities
	Vaccination activities during outbreak response	1. Conduct mop up or circumscribed vaccination of target populations during outbreaks 2. Apply emergency vaccines such as Oral Cholera Vaccine (OCV), Meningitis (Men A&C), Ebola VsV 3. Conduct post campaign assessments

Table :9D Vaccine supply, quality and Logistics

Objective	Strategy	Key Activities
Improve and sustain adequate vaccines supply, quality and appropriate logistics at all levels by 2016 and beyond	Timely forecasting, procurement and distribution of bundle vaccines Ensure availability of appropriate and functional cold chain equipment and transport	1. Conduct annual inventory of bundle vaccines and cold chain equipment 2. Annual forecasting, procurement of bundle vaccines 3. Develop and implement bundle vaccines distribution plan , 4. Construct and operationalize two regional vaccines stores 5. Relocate Central EPI Vaccines Store to Central Medical stores 6. Solarize five counties cold chain depot in the south east 7. Introduce new technologies to monitor temperature (RTMD, FT2)

Objective	Strategy	Key Activities
Effective logistics and cold chain system	Assessment and Evaluation of the vaccine logistics and cold chain system	1. Implement activities in the EVM improvement plan 2. Conduct internal and external EVMA 3. Implement activities in the EVM improvement plan 4. Update and implement cold chain equipment maintenance plans at all levels 5. Improve Cold Chain equipment coverage and new technologies in cold chain equipment through the implementation of the CCEOP 6. Expansion and installation of adequate cold chain equipment 7. Procure spare parts (for Sun frost) and ensure regular maintenance of all cold chain equipment

Data Quality Management

Objective	Strategy	Key Activities
High quality immunization data for decision making at all levels	Data quality assessments (desk reviews and field visits), data quality improvement plan	1. Conduct annual Data quality reviews 2. Conduct quarterly EPI data verification at all level 3. Conduct monthly data harmonization 4. Develop and implement multi-year data quality improvement plans (DQIP) 5. Update, print and distribute EPI data collection tools to include new vaccines

Table : 9E Programme Management

Objective	Strategy	Key Activities
Ensure that EPI programme structures are established, manned, and properly resourced at all levels by 2016 and beyond	Strengthen EPI structures Review the organogram, policy and staff TOR, Ensure availability of technical and sufficient staff to fulfil EPI vision and objectives at all levels Advocate for the inclusion of EPI operations support in national budget to ensure adequate financial sustainability	1. Review and update the national EPI policy and the cMYP 2. Conduct EPI human resource needs assessment at all levels 3. Develop human resources plan 4. Recruit additional staff to fill EPI vacant and new posts at all levels (including the recruitment of maintenance technicians) 5. Conduct training needs assessment and develop multi-year training plan 6. Conduct comprehensive micro plan at all levels to include all aspects of EPI 7. Conduct bi-annual staff evaluation and institute measures to improve programme implementation 8. Maintain/sustain EPI quarterly review meetings 9. Strengthen/establish and support technical working groups to improve programme implementation (eg. NLWG, PMT for CCEOP, etc.) 10. Conduct in-depth EPI review (external) 11. Conduct formative research to drive decision making to improve immunization systems 12. Conduct mid-term and end of period programme evaluations for future planning 13. Provide adequate support (financial, logistical and technical) to EPI operations at all levels 14. Convene stakeholders' meetings and engagement with other relevant partners

Objective	Strategy	Key Activities
		for additional resource mobilization to support new vaccines introduction 15. Conduct quarterly monitoring and supportive supervision to improve data quality and service delivery
Coordination mechanism(ICC, HSCC, County Health Sector meeting, Health Board meeting) remains functional - To integrate EPI communication plan into national health promotion plan	Strengthen coordination and integration mechanisms at all levels.	1. Plan and hold regular Technical Working Group meetings and document minutes 2. Plan and hold cross-border coordination meetings with neighboring countries 3. Conduct sensitization and planning meetings with vertical programmes focal points 4. Integrate communication for immunization (C4I) strategy and plan into national health promotion strategy and plan

Cost, Budget and Financing for EPI cMYP

This section presents the budget, financing and financing gap analysis for the EPI programme, based on the expected activities for the period 2016 - 2020. It will also present different scenarios and identifies strategies that will improve the financial sustainability of the programme.

Costing the cMYP

Methodology

The methodology used is based on estimating the costs of different programme inputs (such as vaccines, personnel, or vehicles needed), and activities to be carried out (such as trainings, etc.). The cMYP guidelines developed by WHO and UNICEF as well as the revised costing tool (2014), were used.

The programme's costs are derived in a variety of costing methodologies, depending on the interventions planned. These include:

- The ingredient approach: based on the product's unit price and quantity needed each year adjusted for by the proportion of time used for immunization. This is used for costing inputs such as personnel, vehicles, etc;
- Rules of thumbs: based on immunization practices, such as a percentage of fuel costs as representative of maintenance costs for vehicles;
- Past spending: where lump sum past expenditure is used to estimate future expenditure. For example past cost per child immunized for specific campaigns, training activities, etc.

Inputs into programme costing

The following is a brief summary of the information incorporated.

Vaccines & Injection Supplies:

The country uses nationalestimates for surviving infants tocarry out forecasting for all antigens, apart from BCG where live births is used. Costs are a function of the unit price for individual vaccines, with quantities determined by the target population adjusted for by coverage and wastage objectives.

Key cost related highlights include:

- The country intends to introduce rotavirus and inactivated polio virus vaccines by the year 2016,
- The country intends to begin human papilloma virus vaccine demonstration project by the year 2016
- The country will carry out a Measles follow up campaign in 2017 and MNTE campaigns in 2017.
- Costs for respective doses of antigens and supplies are based on UNICEF prices. .

Personnel costs (EPI specific and shared):

The personnel for EPI at the national level spend 100% of their time on EPI related activities and on average 5 days per month on supervision apart from the support staff. In addition, costs and time spent on supervision and outreach activities were included for the different cadres at the different levels of the system (counties, districts and health facilities).

Vehicles and transport costs:

The costs of vehicles were derived in the same manner as personnel. Additional maintenance costs were estimated as represented by 15% of fuel expenditure. In 2013 and 2014a total of 19 vehicles (Toyota 4WD) and over??Motorcycles were provided by the EPI partners (GAVI, UNICEF & WHO); with projection to procure additional20 vehicles and 666 for the life span of this cMYP (2016-2020), to reinforce the programme's logistics capacity.

Cold Chain Equipment, Maintenance and Overheads:

Costs were derived as with personnel and vaccines. The program will continue use existing facilities provided by partners and new platform such as cold chain equipment (CCE) optimization platform by GAVI for expansion and upgrading cold chain capacity.

The average running cost per unit of cold chain equipment correspond to the average monthly overheads costs (electricity or fuel depending on the type of equipment) and the average maintenance cost corresponds to the average yearly cost of maintenance and repairs of each unit of cold chain equipment.

Operational Costs for Campaigns:

The operational costs for campaigns were based on operational costs for past campaigns and include all non-vaccine and injections supplies cost. These include the cost of personnel (per-diems…) and other operational costs such as training, transport and social mobilization. The average operational cost per child used for future campaigns operational costs were estimated at US $0.5 for polio; US$0.9 for Measles, and US$0.9 for MNT.

Programme Activities, Other Recurrent Costs

The table below illustrates the estimated costs of the different programme components for the period of the cMYP (2016 -2020).

Table 10:

cMYP Component	Expenditures	Future cost projections					
	US$	US$	US$	US$	US$	US$	US$
	2014	2016	2017	2018	2019	2020	Total 2016 - 2020
Vaccine supply and logistics (routine only)	$ 5,123,413	$ 4,411,759	$ 4,536,239	$ 4,712,570	$ 6,963,831	$ 6,775,756	$ 27,400,156
Service delivery	$ 2,556,894	$ 5,520,970	$ 8,602,712	$11,813,808	$ 15,131,813	$ 18,577,767	$ 59,647,069
Advocacy and Communication	$ 400,000	$ 561,000	$ 416,160	$ 424,483	$ 162,365	$ 165,612	$ 1,729,620
Monitoring and disease surveillance	$ 1,513,920	$ 3,013,529	$ 4,255,288	$ 5,540,422	$ 6,875,370	$ 8,261,615	$ 27,946,224
Program management	$ 810,210	$ 1,696,617	$ 1,178,101	$ 1,760,956	$ 1,769,873	$ 2,279,526	$ 8,685,073
Supplemental immunization activities (SIAs)	$ -	$ 1,956,756	$ 7,712,299	$ 1,313,716	$ -	$ 1,318,061	$ 12,300,832
Shared Health Systems Costs (EPI Portion)	$ 1,521,740	$ 2,842,791	$ 4,299,932	$ 5,795,543	$ 7,276,520	$ 8,766,059	$ 28,980,846
Grand Total	$ 11,926,177	$ 20,003,422	$ 31,000,731	$31,361,499	$ 38,179,772	$ 46,144,396	$166,689,820

Table 11:

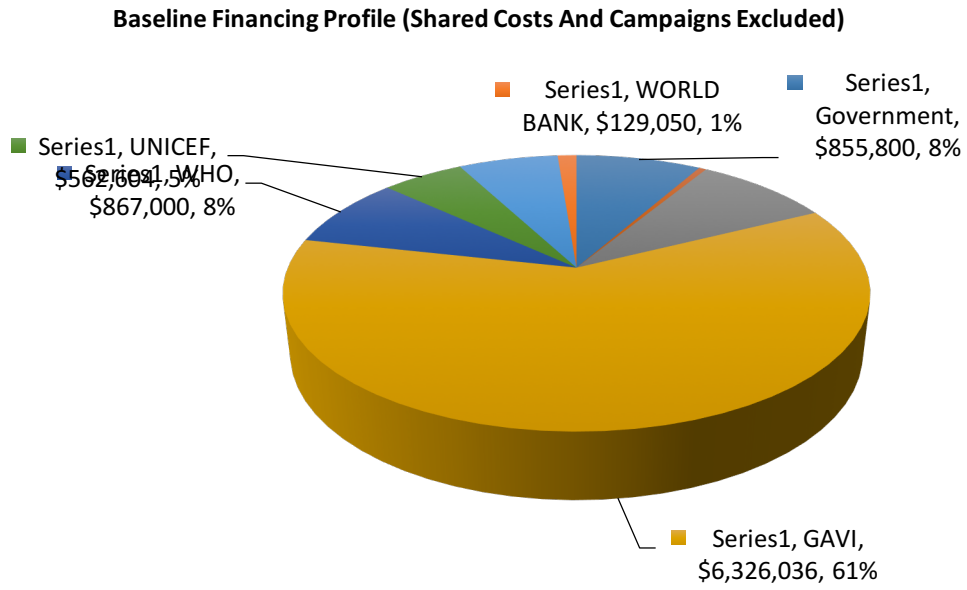
Cost category	2014	2016	2017	2018	2019	2020	Total 2016 - 2020
Routine recurrent costs							
Vaccines (routine vaccines only)	$4,832,072	$3,792,260	$3,903,826	$4,058,818	$6,283,029	$6,073,772	$24,111,704
Traditional	$175,001	$205,511	$209,140	$218,821	$230,781	$233,863	$1,098,117
Underused	$1,497,440	$1,147,010	$1,330,605	$1,286,980	$1,297,934	$1,345,123	$6,407,651
New	$3,159,631	$2,439,738	$2,364,080	$2,553,017	$4,754,314	$4,494,786	$16,605,936
Injection supplies	$185,494	$106,228	$117,291	$127,822	$165,562	$165,593	$682,496

Personnel	$3,549,720	$7,672,889	$11,959,564	$16,414,638	$21,043,131	$25,850,197	$82,940,419
Salaries of full-time EPI health workers (immunization specific)	$1,978,200	$4,373,352	$6,863,519	$9,451,543	$12,140,343	$14,932,914	$47,761,670
Per-diems for outreach vaccinators/mobile teams	$537,600	$1,096,704	$1,677,957	$2,282,022	$2,909,578	$3,561,323	$11,527,583
Per-diems for supervision and monitoring	$1,033,920	$2,202,833	$3,418,089	$4,681,073	$5,993,210	$7,355,960	$23,651,166
Transportation	$41,094	$50,914	$61,236	$80,243	$81,893	$83,530	$357,816
Fixed Site Strategy (Incl. Vaccine Distribution)	$8,561	$10,607	$12,757	$16,717	$17,061	$17,402	$74,545
Outreach strategy	$32,105	$39,776	$47,840	$62,690	$63,979	$65,258	$279,544
Mobile strategy	$428	$530	$638	$836	$853	$870	$3,727
Maintenance and overhead	$311,160	$416,153	$589,474	$671,819	$710,272	$735,528	$3,123,245
Cold chain maintenance and overhead	$0	$49,810	$84,089	$38,532	$16,909	$28,298	$217,638
Maintenance of other capital equipment	$0	$0	$0	$0	$0	$0	$0
Building Overheads (Electricity, Water…)	$311,160	$366,343	$505,385	$633,286	$693,363	$707,230	$2,905,607
Short-term training	$329,050	$416,823	$26,010	$403,126	$162,365	$509,638	$1,517,962
IEC/Social Mobilization	$400,000	$561,000	$416,160	$424,483	$162,365	$165,612	$1,729,620
Disease Surveillance	$480,000	$810,696	$837,199	$859,349	$882,160	$905,654	$4,295,059
Program management	$125,000	$821,651	$599,888	$676,789	$816,726	$1,012,974	$3,928,029
Other routine recurrent costs	$45,000	$91,800	$46,818	$47,754	$97,419	$49,684	$333,475
Subtotal	$10,298,591	$14,740,413	$18,557,466	$23,764,842	$30,404,921	$35,552,183	$123,019,824
Routine capital costs							
Vehicles (100% EPI)	$105,847	$393,265	$418,809	$472,979	$472,305	$481,751	$2,239,110
Cold chain equipment	$0	$70,196	$12,225	$14,418	$26,026	$26,342	$149,209
Other capital equipment	$0	$0	$0	$0	$0	$0	$0

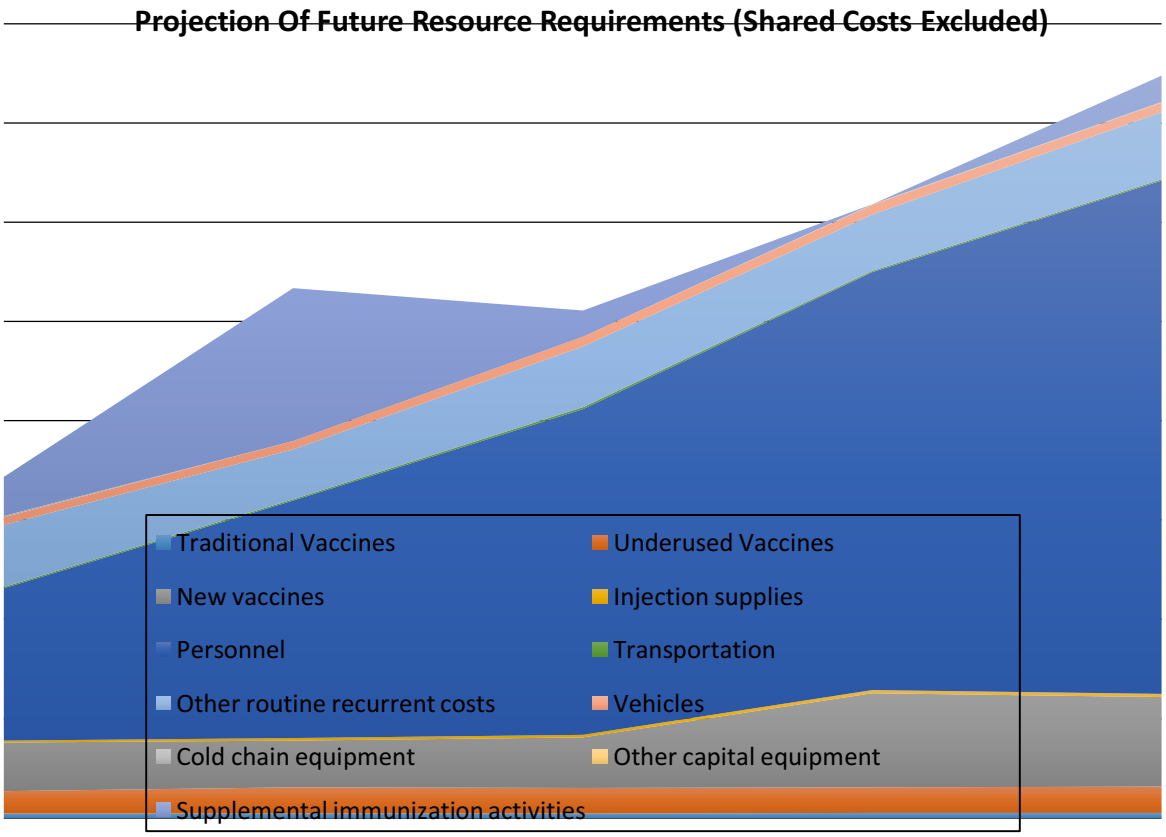
Buildings Construction (100% EPI)	$0	$0	$0	$0	$0	$0	
Subtotal	$ 105,847	$ 463,462	$ 431,034	$ 487,397	$ 498,332	$ 508,094	$2,388,318
Supplemental immunization activities (SIAs)							
Children aged 0-59 months (polio)	0	1,956,756	1,309,068	1,313,716	0	0	$4,579,540
Vaccines & injection supplies	$0	$325,710	$221,704	$226,352	$0	$0	$773,766
Operational costs	$0	$1,631,046	$1,087,364	$1,087,364	$0	$0	$3,805,774
Children aged 6-59 months (measles)	0	0	1,262,617	0	0	1,277,163	$2,539,780
Vaccines & injection supplies	$0	$0	$226,351	$0	$0	$240,897	$467,248
Operational costs	$0	$0	$1,036,266	$0	$0	$1,036,266	$2,072,532
Women of child bearing age (WCBA) 14-49 years (TT)	0	0	5,140,614	0	0	40,898	$5,181,512
Vaccines & injection supplies	$0	$0	$372,789	$0	$0	$40,898	$413,687
Operational costs	$0	$0	$4,767,825	$0	$0	$0	$4,767,825
	0	0	0	0	0	0	$0
Vaccines & injection supplies	$0	$0	$0	$0	$0	$0	$0
Operational costs	$0	$0	$0	$0	$0	$0	$0
	0	0	0	0	0	0	$0
Vaccines & injection supplies	$0	$0	$0	$0	$0	$0	$0
Operational costs	$0	$0	$0	$0	$0	$0	$0
	0	0	0	0	0	0	$0
Vaccines & injection supplies	$0	$0	$0	$0	$0	$0	$0
Operational costs	$0	$0	$0	$0	$0	$0	$0
	0	0	0	0	0	0	$0
Vaccines & injection supplies	$0	$0	$0	$0	$0	$0	$0
Operational costs	$0	$0	$0	$0	$0	$0	$0
	0	0	0	0	0	0	$0
Vaccines & injection supplies	$0	$0	$0	$0	$0	$0	$0

Operational costs	$0	$0	$0	$0	$0	$0	$0
	0	0	0	0	0	0	$0
Vaccines & injection supplies	$0	$0	$0	$0	$0	$0	$0
Operational costs	$0	$0	$0	$0	$0	$0	$0
	0	0	0	0	0	0	$0
Vaccines & injection supplies	$0	$0	$0	$0	$0	$0	$0
Operational costs	$0	$0	$0	$0	$0	$0	$0
Subtotal	0	1,956,756	7,712,299	1,313,716	0	1,318,061	$12,300,832
Shared Health Systems Costs (EPI Portion)							
Shared Personnel Costs	$1,208,580	$2,474,408	$3,790,385	$5,158,012	$6,578,828	$8,054,413	$26,056,046
Shared Transport Costs – Vehicles, Fuel and Maintenance	$0	$0	$0	$0	$0	$0	$0
Shared buildings - construction	$2,000	$2,040	$4,162	$4,245	$4,330	$4,416	$19,192
Shared Buildings – Overhead	$311,160	$366,343	$505,385	$633,286	$693,363	$707,230	$2,905,607
Subtotal	$ 1,521,740	$ 2,842,791	$ 4,299,932	$ 5,795,543	$ 7,276,520	$ 8,766,059	$ 28,980,846
Grand Total	$ 11,926,177	$ 20,003,422	$ 31,000,731	$ 31,361,499	$ 38,179,772	$ 46,144,396	$ 166,689,820
Routine Immunization	11,926,177	18,046,666	23,288,432	30,047,783	38,179,772	44,826,336	154,388,988
Supplemental immunization activities (campaigns)	0	1,956,756	7,712,299	1,313,716	0	1,318,061	12,300,832

Programme expenditure and Financing



7.3 Financing for the programme



FinancialSustainability Strategies

Based on the above programme financing situation, the financial sustainability strategies will be focusing on the following key objectives:

- Strengthen the Government contribution to EPI,
- Secure the probable financing for the programme,
- Mobilize additional resources for the programme,
- Improve the programme management.

Respective strategies to be followed up are illustrated in the table below.

OBJECTIVES	STRATEGIES	ACTIONS
Objective 1: Strengthen Government contribution in EPI	**Strategy 1.1**: Advocacy for sustainable immunization financing	- Continue advocacy meetings with the legislature to increase budgetary allocation for immunization
		- Include discussions on immunization financing in ICC meetings

OBJECTIVES	STRATEGIES	ACTIONS
		-Provide information on immunization financing in EPI bulletin at least twice a year
		- Annually update costing and financing information for EPI activities
	Strategy 1.2: Strengthen inter-sectoral collaboration	- Ensure participation of health focal persons from line Ministries and Government Agencies in HSCC and ICC
Objective 2: Secure the probable financing for the programme	▪ **Strategy 2.1:** Secure probable funds	- Disseminate the EPI cMYP to ensure all partners are aware of planned strategies, and financing situation for the programme
		- Discuss with traditional EPI partners during the development of their respective programme of work for the coming years
Objective 3: Mobilize additional resource for the programme	▪ **Strategy 3.1:** Seek additional funds from EPI partners	Mobilize fund from other donors such as USAID, World Bank, etc. to fund planned programme activities and inputs
Objective 4: Improve programme management to achieve higher performance	▪ **Strategy 4.1:** Reduce vaccine wastage rate	- Implement open vial policy -Improve vaccine and cold chain management - Appoint a skilled logistician - Put in place a sound logistic management system
	▪ **Strategy 4.2:** Implement REC/REP strategy approach in all counties	- Train the personnel involved in the implementation of EPI activities at health facility level -Conduct regular supportive supervision -Provide operational support

OBJECTIVES	STRATEGIES	ACTIONS
	▪ **Strategy 4.3:** Strengthen VPD surveillance	-Training of county and district health officers as well as OICs -Track surveillance indicators -Conduct regular review/feedback meetings - Provide operational support to counties to enhance VPD surveillance

CHAPTER FIVE: MONITORING AND EVALUATION

5.1 **Description of M&E Plan**

The M&E framework will guide the implementation of the MOH and partners Supported activities (2016 -2020). Key performance indicators for monitoring EPI activities are incorporated in this document. The activities outlined in the cMYP 2016 – 2020 for immunizations in Liberia, will be monitored as part of the regular M&E process by the Ministry of Health M&E unit. The rationale is to monitor implementation of activities outlined in the cMYP and validate data that will be generated for decision making.

Indicators have been developed based program thematic areas:

1. Service delivery
2. Vaccine supply, Quality and logistics
3. Communication and Social mobilization
4. Surveillance and data management
5. Program Management

The levels for performance monitoring is described as follows:

•Facility level – (i) Monthly review of data (ii) Timely reporting and feedback

District level – (i) Monthly review of data and feedback at districts (ii) supportive supervisory and monitoring visits (iii) monthly data validation and feedback.

• County level –(i) Monitor results primarily through the HIMS and send feedback to the district level. (ii) Quarterly monitoring visits to all districts to provide technical guidance. (iii) Quarterly and annual performance reviews

• National level – (i) Quarterly MoH/health partners" joint monitoring, (ii) bi-annual and annual reviews, (iii) quarterly managerial and technical visits to counties and districts, (iv) health summit to assess the performance of the sector (including performance of health partners), (v) bi-annual

HSCC meeting to report progress made in implementing EPI annual programme of work as well as other development partner intervention support.

5.2 Data source for M&E:

The main data sources for routine monitoring and evaluation of performance are from the ledgers (facility and outreach), tally books, summary books, child health books, HMIS Reporting Forms and DHIS2.

Progress on the implementation of activities and immunization data will be reported through the existing reporting systems (which is from health facility through county to national level). In addition to the routine system, the outcome and impact indicators will be reported through surveys and LDHS and the other process monitoring systems including operational research. These include coverage surveys, EVMA, cold chain inventory, dropout surveys, KAP, safety monitoring, AEFI, etc. There is also quarterly and annual EPI reviews to identify challenges and to re-strategize.

5.3 M&E Systems Strengthening Activities:

The MOH has a technical unit responsible for coordinating M&E activities within the health sector. Notwithstanding, a clear M&E Framework to spotlight performance of the EPI activities is Critical. In a bid to strengthen and integrate EPI- M&E framework into the overall MOH-M&E; the following activities will be carried out.

- Strengthen human resource capacity at all levels to enhance efficient EPI service delivery
- Review key EPI indicators and set priorities
- Strengthen infrastructure for data collection and timely reporting

Strengthening of the EPI M&E will include the composition of the M&E and/or Supportive Supervision Team; which consider

1. the right information/data,
2. the right resources,
3. the right persons/Staff,
4. the right tools and
5. feedback to the right persons and authorities.

Table 8: Monitoring and Evaluation System

		Immunization Indicators	Baseline			Target				
			Value	Year	Source	2016	2017	2018	2019	2020
1	Service Delivery	**Penta3 coverage: % of surviving enfant receiving Penta3**	65 %	2015	Administrative Data (JRF)	75 %	80%	86 %	88 %	90 %
2		**% point difference between Penta 3 national administrative coverage and survey point estimate**	16.2%	2012	Administrative and Survey Data (JRF)			13 %	10 %	10 %
3		**Drop out Rate: Penta1 - Measles coverage)/Penta1 coverage * 100**	15 %	2015	Administrative Data (JRF)					
4		**Drop out Rate: Penta1 - Penta3 coverage)/Penta1 coverage * 100**	15 %	2015	Administrative Data (JRF)			10 %	8%	6%

5		**Fully Immunized Coverage: % of one year olds who have been fully immunized**	55 %	2015			75%	80 %	85 %	75 %
6		**Outreach Performance: % of children vaccinated with Penta3 during outreach**								
7	**Vaccine supply, quality & Logistics**	**Stock out: % of health facility with Stock-out for all vaccines**								
8		**Cold chain Equipment: % of health facilities with functional cold chain equipment (refrigerator)**	86 %	2017	Annual Cold chain inventory Assessment Report			87 %	87 %	83 %

9	Advocacy, Communication & Social mobilization	Proportion of parents/care givers interviewed who are aware of immunization		2017	Exit interview during supportive Sup.					
10		Proportion of health facilities with community health committee members trained on interpersonal communication								
11	Surveillance and Data Management	% county reporting VPD surveillance data								
12		% of health facility 100% data completeness in the HMIS								
+		% of timeliness of								

		report in the HMIS								
14	**Program Management**	**Proportion of health facilities with operational microplans**								
15		**% of EPI management team members at central level who have received training in Program Management, Financial Management, M&E, Basic Procurement & Supplies Management and MLM training**								

In order to improve immunization outcomes and data quality, the below activities will be conducted:

- Conduct integration meeting with MOH M&E Team and present key EPI Indicators for adaptation in MOH M&E Plan
- Develop TOR for M&E team in the field
- Build capacity of EPI staff on M & E Tools and how to access information on the server
- Develop and implement integrated M&E checklist in monitoring and supervision
- Monitor monthly performance and provide feedback
- Strengthen data management systems at the facility level
- Conduct regular coaching on data quality

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7. EPI Recovery Plan 2015
8. EPI cluster Survey 2012
9. Liberia National Health Accounts Survey 2008
10. United Nation Human Development Index Report
11. WHO Web Site:
12. MoH Web Site:
13. National Population Housing census 2008
14. Liberia Post Measles Coverage Survey 2015

TIMELINE OF ACTIVITIES 2016 -2020

#	Key activities	2016	2017	2018	2019	2020
A. Service Delivery						
1	Develop and implement micro-plans at HF, district, county and national levels					

2	Increase the number of health facilities providing EPI services					
3	Integrate RI with other high impact interventions (Vitamin A, etc.)					
4	Conduct outreach in underserved and hard – to – reach areas					
5	Conduct at least 3 rounds of PIRI annually					
6	Conduct high quality polio NIDs integrated with other high impact interventions (Vitamin A, Mebendazole, etc.)					
7	Conduct regular supportive supervision					
8	Conduct regular monitoring and evaluation					
	Procure stock of Vit-A for infants and postpartum mothers					
	Conduct Measles follow up campaigns for <5s integrated with Vit A, Mebendazole and LLIN					
	Prompt investigation and response to all suspected and confirmed cases of outbreak					
	Joint planning with other Health Services Programmes (Malaria Control, Family Health, Nutrition, Health Promotion, etc.)					
	MNT surveillance and response to outbreaks					
	TT SIAs nationwide in 2017 for WCBA					
	Implement the tOPV to bOPV switch plan at all levels					
	Implement Rotavirus vaccine introduction plan					
	Implement HPV Demonstration project					
	Conduct Rotavirus vaccine post introduction evaluation (PIE)					
	Prepare and submit application on HPV national rollout					
	Conduct required evaluations for HPV Demo Project					

	Ensure availability of adequate quantities of Yellow Fever vaccine in all counties					
	Strengthen surveillance and response to outbreaks of YF.					
	Establish/maintain and regular update directory of all relevant stakeholders					
	Plan and hold coordination meetings; document and disseminate the proceedings of the meetings, implement follow up actions. Details properly stored					
	Plan and hold coordination meetings with neighboring countries					
	Conduct sensitization and planning meetings with vertical programmes focal points					
	Maintain and ensure the use of the national health plan and health reforms					
	Use the existing Health Care WASH Assessment Report done in 2015 { MOH, UNICEF, Public Work} to develop and implement EPI waste management plan in all counties					
	Adopt appropriate waste management technology and system					
	Provide capacity building for service providers at all levels					
	Implement activities in the EVM improvement plan					
B. Advocacy, communication and social mobilisation						
27	Conduct health sensitization and coordination meetings at all levels					
28	Update and implement communication plans for routine and SIAs					
C. Surveillance						
	Conduct regular surveillance visits to priority sites.					
	Conduct training for all surveillance officers at all levels					
	Production of surveillance tools and training materials					

	Conduct community and clinicians sensitization					
	Support outbreak investigation and response					
	Provide operational support at all levels					
	Hold NTF, NPEC and NCC meetings					
D. **Vaccine supply, quality and Logistics**						
	Annual forecasting, procurement of bundle vaccines					
	Installation of adequate cold chain equipment and temperature monitoring devices					
	Develop distribution plan,					
	Distribute bundle vaccines					
	Expansion/construction of dry storage at all levels					
	Implement activities in the EVM improvement plan					
	Procure 22 vehicles (15 for CHTs; 2 regional cold stores; 5 national) for supervision					
E. **Programme Management**						
	Conduct EPI human resource needs assessment at all levels					
	Develop human resources plan (including maintenance technicians)					
	Recruit additional staff to fill EPI vacant and new posts at all levels					
	Conduct training needs assessment and develop multi-year training plan					
	Conduct bi-annual staff evaluation and institute measures to improve programme implementation					
	Conduct in-depth EPI review (external)					
	Conduct formative research to drive decision making to improve immunization systems					
	Conduct mid-term and end of period programme evaluations for future planning					

Annual workplan 2016

Id Number	Task name	Start month	End month	% Compl	1	2	3	4	5	6	7	8	9	10	11	12	Budget	Expenditure Tracking	Notes
	Provide quarterly financial support to 334 HF for outreach vaccination Teams for 12 months @ US$50.00	1	12	0.0%													416,520		
	Conduct refresher training on immunization in practice for 66 TOT and 1,108 service providers	1	1	0.0%													216,565		US$359,110.00 available
	Conduct quarterly periodic intensification of routine immunization (PIRI) in all counties	3	12	0.0%													525,000		PIRI activities implementation dates: March, June, September and December 2016
	Conduct quarterly monitoring and supportive supervision to district and HFs (provide US$150/month for 12 months)	1	12	0.0%													27,000		
	Assignment of technical assistant to support poor performing Counties , 1month (DSA, Fuel Vehicle maintenance and contigency)	2	2	0.0%													30,000		
	Conduct national micro-planning exercise	1	1	0.0%													53,110		
	Urban Strategy Implementation	1	12	0.0%													216,000		
	HPV Demo Project in Bong & Nimba	4	10	0.0%													138,500		Assessment in April, launch in May, and 2nd dose administration in November 2016
	Conduct 3 rounds of polio NIDs with one of the rounds being integrated with vit A & mebendazole/albendazole for children under five years	2	10	0.0%													1,956,756		round 1 in Feb., round 2 in Mar., and round 3 in Oct. 2016, budget is including vaccine cost.
	Mass media communication	1	12	0.0%													90,000		
	Support the development/production of messages	4	4	0.0%													309,750		
	Provide support to dissminate messages to counties for switch and new vaccine introduction	1	3	0.0%													200,000		
	support for community engagement (community meetings, defaulter tracking, etc.)	1	12	0.0%													235,000		
	Production and airing of health communication materials and messages for routine immunization and campaigns	1	12	0.0%													70,000		
	Conduct BCC, IPC Training at national and county level.	3	3	0.0%													59,000		
	Revision of social mobilization plan/ strategy	2	2	0.0%													10,000		
	Monitoring and supervision of Routine Socail mob and communication activities in the fifteen counties	3	12	0.0%													50,000		
	Provide regular logistics support and equipment for the conduct of active surveillance activities at counties and districts	3	12	0.0%													60,000		Support to be provided quarterly
	Support outbreak investigation and response	1	12	0.0%													30,000		
	Provide financial support for NCC, NEC, and NPEC activities	3	12	0.0%													15,000		

Annual workplan 2016 Cont'd

Id Number	Task name	Start month	End month	% Compl	1	2	3	4	5	6	7	8	9	10	11	12	Budget	Expenditure Tracking	Notes
	Fuel for County Generators	1	5	0.0%													52,500		
	Fuel for County Vehicles for vaccine distribution	1	5	0.0%													42,000		
	Vehicle maintenance support county level vehicles @ $250/month	1	5	0.0%													51,000		
	Support for Transport at district level for distribution of vaccines x 91 districts	1	12	0.0%													52,800		
	Supplies and maintainance for district & HF motorbikes 150 @ $20/month	1	12	0.0%													36,000		
	Vehicles insurance for 1 year	2	2	0.0%													5,100		
	Motorbike insurance for 1 year	2	2	0.0%													7,500		
	Support for running and maintainance of central and 2 regional cold	1	12	0.0%													36,000		
	Insurance, running and maintainance cost for refrigerated and ulitlity trucks	2	2	0.0%													5,400		
	Procurement (international) of one 4 X 4 ultility truck for delivery of assorted immunization supplies	2	8	0.0%													60,000		
	Purchase of 140 pieces solar direct drive refrigerators for the expansion of HF cold chain	2	8	0.0%													560,000		
	Purchase of IPC materiels	3	9	0.0%													280,684		
	Purchase of rain gears for vaccinators and midwives for 530 HFs	1	2	0.0%													26,500		
	Procrement of data management and ICT equipment (e.g. Lap top, back-up, antivirus, etc) for County and National levels	3	4	0.0%													24,000		
	Procure 100 motorbikes for integrated outreach services	1	5	0.0%													236,900		