REPUBLIC OF RWANDA

MINISTRY OF HEALTH

RWANDA EPI/VACCINE PREVENTABLE DISEASES PROGRAM,
COMPREHENSIVE MULTI-YEAR PLAN

2017-2021

Contents

Executive summary

I. Background

1. National health system

With 26,338 square kilometers, Rwanda is a country in central and eastern Africa with a population of 10,515,973 (Census, 2012). The population is young as the mean age is 22.7 and predominantly rural with 83% of the population, with a density of 415 inhabitants per square km one of the highest in Africa. Rwanda is located a few degrees South of the Equator, it shares its borders with Uganda to the North, Tanzania to the East, Burundi to the South, and the Democratic Republic of the Congo to the West. Rwanda is at high altitude, with a geography dominated by mountains in the west and north, savanna in the east, and numerous lakes throughout the country. The climate is temperate, with two rainy seasons and two dry seasons.

The health system in Rwanda is organized as a three-level pyramid. The central level includes the directorates of the Ministry of Health (MoH), Rwanda Biomedical Center (RBC) which is the implementing agency of MoH and the national referral hospitals.

The district level includes district hospitalsThe peripheral level (administrative sector) includes health centres and health posts which provide primary health care to the population within the health catchment area.

The central levelis essentially responsible for the development of health policy and norms; it is also in charge of establishing strategies and guidelines that are provided to health services. Its role is also to conduct monitoring and evaluation of the health situation, as well as to coordinate resources at the national level.

The intermediate level helps the health centres to implement health policy and norms developed at central level. It trains and supervises health workers at the health centres, collects health data and analyses and sends feedback.. The peripheral level is the operational unit represented by the health centers and health posts taking care of a defined population in a given health catchment area. Health centers' staff works with representatives from the community plans and provides primary health cares to the population.

Rwanda currently has 42 district hospitals and about 481 health centers and …. Health posts.. At theset levels, decision-making process is carried out in a collegial manner, by way of multiple committees. The management structures at district level include the district health management team (DHMT), the hospital health committee, and the health committee of each health centre. The composition, role, and authorities of these different committees are well defined.

2. Program management

2.1. Immunization program vision, Mission and Goals

2.1.1. Vision of Rwanda Immunization Programme:

The Vision of EPI is to eliminate/eradicate all vaccine preventable diseases in Rwanda

2.1.2. Mission of Rwanda Immunization Programme:

The mission of EPI is to contribute to the improved well-being of the Rwandan people through reduction of morbidity and mortality due to vaccine-preventable diseases.

2.1.3. Goal of 5 years Immunization Strategic Plan

The main goal of this 5 years strategic plan is to maintain the achieved performance in terms of vaccination program. Vaccine Preventable Diseases Program will continue to focus on VPD and much emphasis will be put on VPD under eradication and elimination.

2.2. Planning process

Rwanda has developed its National strategy for Economic Development and Poverty Reduction Strategies (EDPRS) that has to guide all sectors contributing to the latter. In this context, the Health sector developed its sector strategic plan (HSSP) fully aligned to EDPRS with clear defined priorities for different programs including EPI.

As implementing agency of the health sector, Rwanda Biomedical Centre (RBC) has different programs among others Maternal, child and community health (MCCH) in which EPI belongs to. According to its mandate and considering global commitments and priorities, the national EPI develops its own strategic plan known as comprehensive Multi-Year Plan (cMYP) for five years.

In order to develop a strong cMYP and in the spirit of integration delivering from the National strategies (EDPRS, HSSP), EPI invites, on one hand, stakeholders from different levels in the national health system involved in child survival health for consultations and on the other hand, different review reports are referred to for setting priorities to be included in this strategic plans. Once approved by senior managers of MoH and RBC, the EPI cMYP is presented for endorsement by the Inter-agency coordination committee (ICC) chaired by Honourable Minister of Health, and then is disseminated to local and international partners for reference and use.

For an effective implementation of the approved EPI cMYP, the districts also develop their integrated and customized strategic plans including immunization operations always referring to the approved EPI cMYP.
Inthe community, the implementation of the cMYP is led by Health Centres. Health centers strategic plan are developed with reference to the district strategic plans.

The immunization program refers to this cMYP to develop annual operation plans and funds mobilization. Every two years, a mid-term review will be conducted to evaluate the progress towards set objectives.

2.3. Administration and coordination

Rwanda Biomedical Centre (RBC) is composed of 2 departments, namely Biomedical services department and Institute of HIV, Diseases Prevention and Control (IHDPC) department. Under each department, there are different divisions. Among divisions operating under IHDPC there is maternal, child and community health (MCCH) division to which vaccine preventable diseases program (EPI) belongs.

Immunization activities are coordinated at the national level by the national Interagency Coordinating Committee (ICC), which works with all the technical partners on a routinely basis. At a very high level, ICC is chaired by the Honorable Minister of Health and meets on a quarterly basis.

Vaccine preventable diseases program (VPDP) has in total 18 technical and supporting staff among whom 6 (33%) are public servants while others are contractual staff.

The EPI staff as other staff of public institutions is recruited according to Rwanda public labour law.

There is formal on job training and the health sector has a general policy for staff's career development. Every staff has to define and sign an annual performance contract with his supervisor whose activities are in line with the objectives of the program. The performance contract is evaluated on annual and influences incentives.

3. Logistics and Supply chain

3.1 Vaccines and vaccine materials procurement

Vaccines and vaccine materials forecasting is done annually. The national EPI vaccines shipment is done twice a year from international manufacturers through the UNICEF supply systems.

Procurement activity is initiated by UNICEF in accordance with the valid memorandum of understanding between Ministry of Health/RBC –and UNICEF. Currently, the EPI purchases 12 Antigens in routine immunization BCG; DTP-HpB-Hib. OPV; Rotavirus vaccine, MCV, RCV, TT vaccine, PCV-13 and HPV. Other non routine vaccines include Rabies vaccine, yellow fever vaccine, meningitis vaccine, HpB (adults).

3.2 Vaccine storage and distribution

From the manufacturer, the vaccines and vaccine materials are stored in central level stores respecting international standards. The following figures are about cold rooms available for the Capacity at National level.

Table 01: Storage capacity at National Level

Available Cold rooms	Gross Capacity	Net Capacity
Cold room 1	20CM	5.128CM
Cold room 2	25CM	6. 044CM
Cold room 3	30 CM	7.143CM
Cold room 4	30 CM	7.143CM
Cold room 5	40 CM	9.5CM
Cold room 6	40 CM	9.5CM
Cold room 7	40CM	9.5CM
Cold room 8	40 CM	9.5 CM
Freezer room	15 CM	4.054 CM

In addition to the cold store, there is also a hired dry store of the capacity of 4,000M^3 to accommodate the volume of the EPI consumables.

Cold rooms at the national store are equipped with computerized wireless temperature monitoring devices with alarm system and automatic phone dialers. All Cold rooms and refrigerators are equipped with a combination of fridge tags and thermometers. Temperature registration sheets are standardized to record twice daily manual temperature measurements.

The National cold store is connected to the national electricity grid and two 2 standby generators are available to power the equipment in case of power disruption. The premises are also equipped with fire alarm system and extinguishers. Vaccines and equipment are insured.

The distribution of vaccines and vaccine material uses the pull system from central to peripheral level according to established distribution plan.

At the national level, a refrigerated truck is available for vaccine distribution in case of emergency and two 4WD vehicles for supervisory activities. The program needs more vehicle and additional drivers in order to cover its needs effectively.

For routine vaccine transport, staff from district hospitals comes to collect vaccines and other medical supplies once every month. District hospitals have 4WD vehicles available for vaccine and drug transportation, and supervision activities. Vaccines during transport are taken in cold boxes with conditioned ice packs.

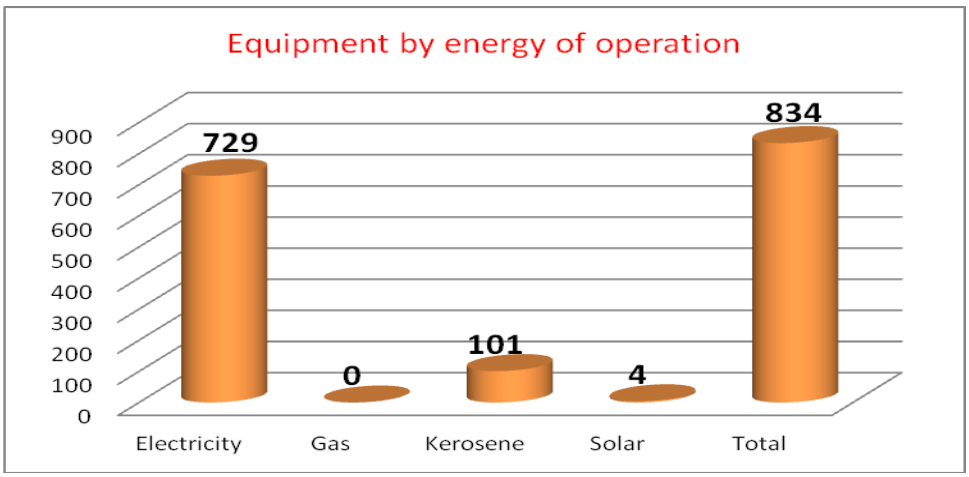
At the health facility level, motorcycles are available. Staff from health facility level goes to collect vaccines, other medical supplies and bring reports, once every month, at the district hospital level. For transport between HC level and District level and in outreach session, vaccines are kept in vaccine carriers to maintain cold chain.

3.2.1 Logistics/distribution

At peripheral levels, vaccine stores are all located within the health facilities premises. Most district hospitals (82%) have enough cold chain capacity to deliver immunization services to the target population. Most of health facilities (66%) are connected to national grid while the rest (34%) use kerosene for their refrigerators. Most health centres (88%) have at least adequate vaccine storage capacity.

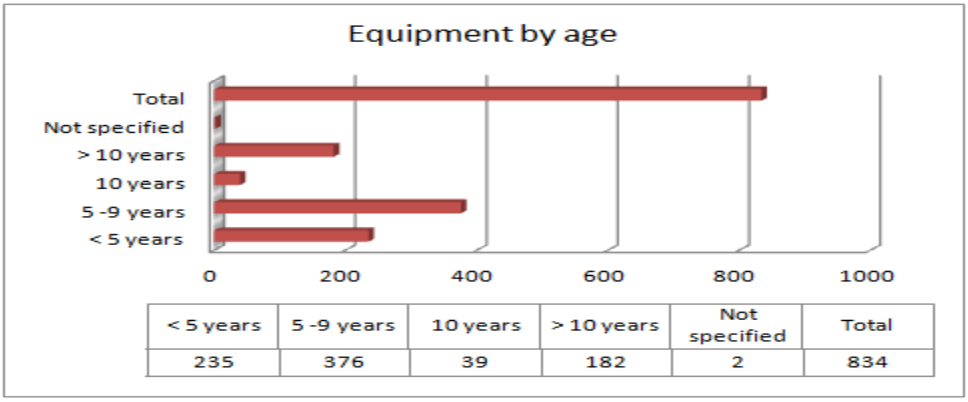
The storage capacity will be adequate once the redistribution plan is implemented and faulty equipment repaired based on the findings of the cold chain inventory of 2013 shown in the table below

Figure 01: Summary of EPI cold chain equipment



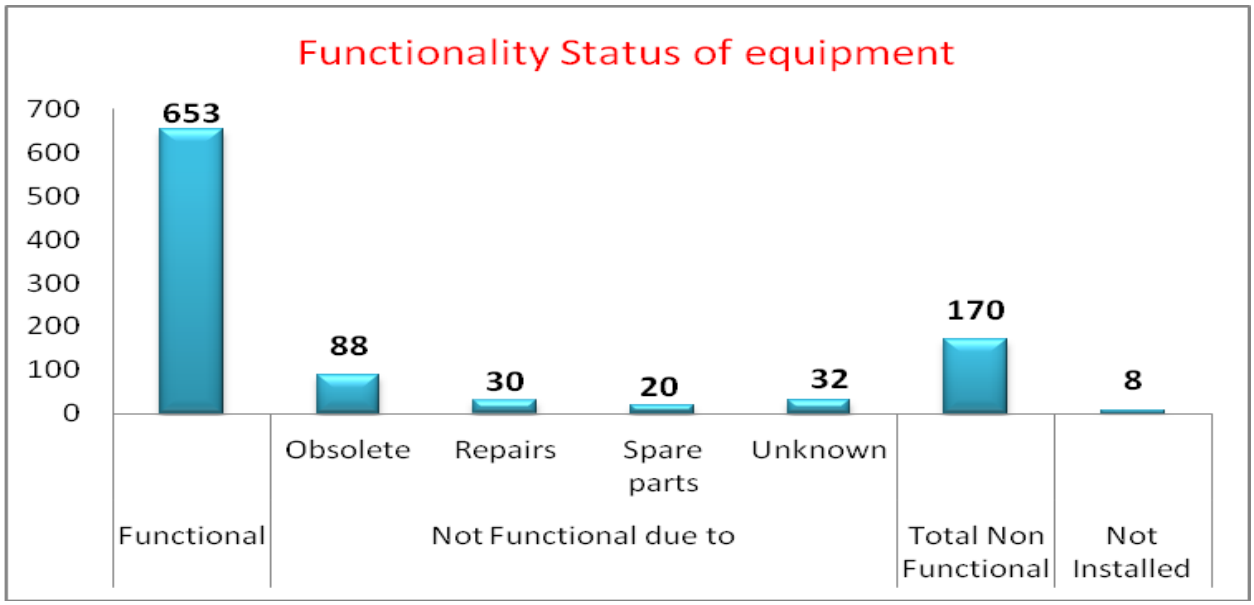
The figure above shows proportion of equipment by energy type as compiled as found by this assessment where 729 equipment uses electricity while 101 operate using Kerosene. Rwanda is at introductory level of using solar refrigerators hence few of them are found in the system. This may not be unconnected with the widespread of electricity availability in the country.

Figure 02: Classification of equipment by age



From the figure above it shows that 221 (26.5%) equipment in the country is either ten years old or more (obsolete) which means all equipment under this category is due for replacement by standard. On the other hand, 235 (28.2%) of the equipment is less than five years old while 376 (45.1%) is of age between 5 and 9 years.

Figure 03 : Status of functionality of equipment



The above figure summarizes proportion of equipment in functional status and otherwise as well as various reasons for non-functionality.

3.2.2 Vaccine Recording and reporting systems

The national level utilizes vaccine ledger cards and the vaccine Stock Management Tool (SMT)for monitoring and reporting utilization of vaccines and vaccine devices.

The district hospital vaccine stores and health centres use standardized registers for stock management and movement of immunization devices. System uses Requisition Issue Receipt (RIR) vouchers and stock cards/ledgers for vaccines and immunization supplies. Vaccination coverage and wastage rates are also reported using RIR vouchers. There are also separate stock registers for vaccine devices.

3.2.3 Maintenance of cold Chain Equipment

There is a public medical maintenance service known as Medical Technologies and Infrastructure Division under RBC which is responsible for maintenance of medical equipment and health infrastructure including EPI CCE. The division is also responsible for training and supervision of technicians in charge of medical equipment maintenance at district level. Specifically, EPI has an engineer in charge of preventive and curative maintenance of cold chain equipment for central level store..
Refrigerators for vaccines storage, vaccines transportation materials and pare parts of CCE needed at peripheral level are purchased and provided by the National EPI.

4. Information, Education and Communication

Currently, social mobilization and communication for health including immunization in Rwanda is coordinated by Rwanda health communication center Division (RHCC)/RBC which defines objectives and communication strategies related to immunization services components.

Different communication channels are used for health communucatin through community health workers, , monthly community work, public and private radios and newspapers.

For the various new vaccines introduction and integrated SIAs, cascade trainings are conducted for health care providers and community health workers prior to the given interventions in order to increase community awareness.
There is also a high-level political implication to support the community awareness through community meetings.

Key messages are developed by EPI and disseminated through a variety of communication channels (e.g. brochures, posters, leaflets, announcements on radios and in churches, …. in the local language).

In general, immunization is widely accepted and appreciated by the Rwandan population because there is no resistance so far reported in the community.

5. Service delivery

Immunization activities are fully integrated into the routine health services within each health facility. Routine immunization is intended to reach all infants under two years of age with eleven available antigens to protect them from the following vaccine preventable diseases (VPD): tuberculosis, poliomyelitis, diphtheria, tetanus, pertussis, hepatitis B, *haemophilus influenzae* type b, measles, rubella, *streptococcus pneumonia* and rotavirus infections. In addition, all the adolescent girls 12 years of age are targeted to be protected from cervical cancer with human papilloma virus (HPV) vaccine and pregnant women to be protected from tetanus, during the antenatal care visits, according to the WHO immunization schedule with toxoid tetanus (TT).

The target population are reached using combination of several approaches; fixed sites (health centres) and outreach sessions for the hard to reach areas. More than 90% of Rwandan's children are vaccinated at the fixed sites[1]. The outreach strategy has been revitalized in most of health facilities, using financial support made available by Government and GAVI Alliance. Since 2005, Reach Every District (RED) approach was introduced in all districts.

In 2002, Rwandan EPI expanded its immunization schedule to include the pentavalent vaccine, a DPT containing vaccine (DPT-HepB+Hib), given to all children at the same time with oral polio vaccine (OPV). In April 2009, a new vaccine, pneumococcal conjugate vaccine (PCV) was also introduced to National Immunization Program. In 2011; HPV vaccine was added to the routine immunization program in order to protect adolescent girls from cervical cancer using a school-based immunization approach at the beginning and shifted to age-based approach (12 years) from 2014. In May 2012, EPI introduced one more life-saving vaccine, the rotavirus vaccine, into its routine program and, finally, in January 2014, rubella vaccine combined in Measles/Rubella vaccine was introduced in routine immunization and given at nine month and MCV as measles second dose at fitteen month. The current immunization schedule is as follow:

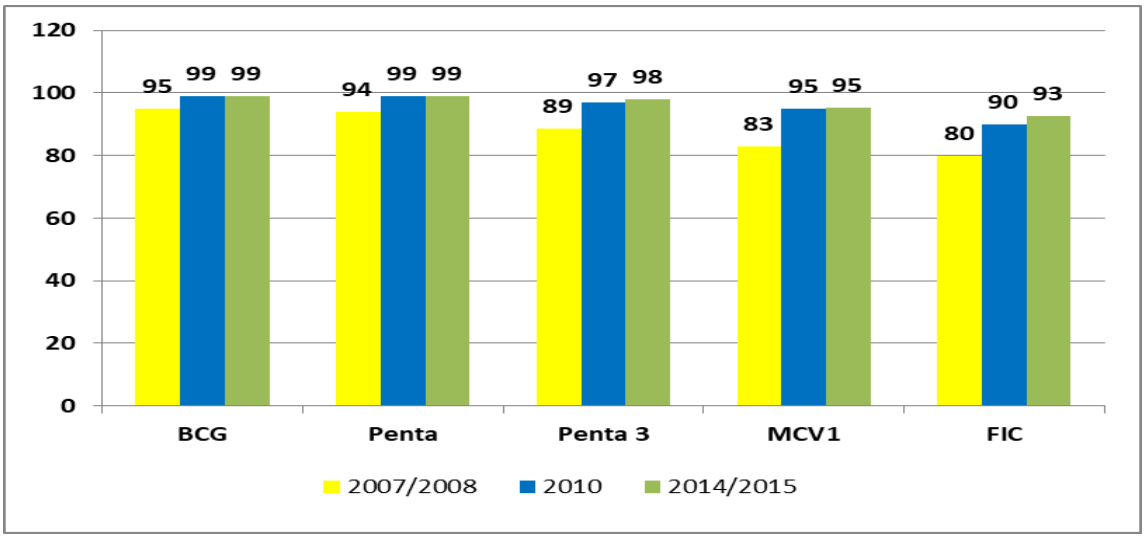
Table 02: Current routine immunization schedule

Vaccine	Total doses	Age and interval
BCG	1	Birth
OPV	4	Birth, 6, 10, 14 weeks
DTP-HepB-Hib	3	6, 10, 14 weeks
Pneumococcal Conjugate Vaccine (PVC13)	3	6, 10, 14 weeks
Rotavirus vaccine (Rotarix)	2	6, 10 weeks
Measles-rubella (MR vaccine)	1	9 months
Measles vaccine(MCV)	1	15 months
TT (pregnant women)	5	First contact, 1, 6, 12, 24 months (interval)
HPV	2	2 doses of HPV for each cohort of girls 12years old

[1]National Immunization Coverage Survey, conducted in 2013

The immunization coverage for fully immunized children (FIC) progressively increased and is maintained at high level 92.6%, (DHS 2014/2015).

Figure 04: Trends of BCG, Penta1, Penta3, MCV1 and Fully Immunized Children, according to DHS reports 2007-2015



According to last immunization coverage survey conducted in 2013, 94% of rwandan children are fully vaccinated, 98% of surving infants have received the 3rd dose of DPT-containing vaccine and 97% surviving infants have received measles containing vaccine.

The utilization of immunization services in Rwanda has reached a satisfactory level. The table below shows the trends drop out rates maintained below 10% in most districts from 2003 to 2013.

Table 03: Penta1-Penta3 drop-out rate trends by year, 2007-2016

D.O. rates	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Penta1-Penta3	-1.4%	5.4%	0.2%	-0.9%	3.1%	0.5%	1.3%	1.4%	2.2%	2.7%
% districts with D.O. < 10% for Penta1-Penta3	100%	100%	100	100%	97%	100%	100%	100%	100%	100%
% districts with D.O. > 10% for Penta1-Penta3	0%	0%	0%	0%	3%	0%	0%	0%	0%	0%

Rwanda adapted the WHO strategy of accelerating control/elimination/eradication of EPI targeted diseases; measles, polio and NNT. In 1996, Rwanda has started polio eradication initiative using all strategies including polio SIAs. For measles, Rwanda introduced catch-up measles SIAs since 2003 followed by periodic follow-up SIAs.

The SIAs were integrated with other child health survival interventions like vitamin A supplementation, deworming, distribution of mosquito nets, Etc.

Table 04 : Measles/Polio SIAs, Rwanda, 2003- 2013

	Coverage					
Interventions	**2003**	**2006**	**2009**	**2010**	**2011**	**2013**
Measles campaign	101%	107%	101%	**91.0%***		97.5%
Polio			102%	99.5%	97%*[2]	
Vitamin A	101%	109%	106%	108%		83%
Deworming		108%	107%	98.5%		
ITN distribution		101%				
HPV					97%	91%

*Mini Measles campaign in Rusizi district in July 2010

6. Monitoring and management of adverse event following immunization (AEFIs)

Since 2002, Rwanda has introduced a lot of new vaccines in its routine immunization program.
It required the program to establish monitoring system of AEFIs to avoid, on one hand, the spread of rumours about vaccines, and on the other hand, for better management of those AEFIs once occurred.
To assist the operational level to monitor AEFIs, the central level has developed an EPI guideline document which is includes AEFI component. .
Health care providers are trained on AEFIs related to all new vaccines introduced.
Among topics of health education given prior the vaccination session, parents are sensitized on potential AEFIs.
Investigation forms are available at all health facilities to enable the reporting. When an AEFI occurs, the health care provider conducts an investigation and fills the form which is sent to upper level for further analysis and appropriate action.

Since 2011, an AEFIs database is available at national level and 50 cases have been reported and investigated. Given the high number of antigens provided in routine immunization and the number of AEFIs cases reported in database, there is probably an under reporting of AEFIs cases mainly due to the weak follow up of AEFIs surveillance at all levels.
For AEFIs management, all vaccination sites including outreach sites have a minimum emergency kit consists of hydrocortisone and syringes.

[2]Mini Polio campaign in 3 bordering districts at high risk: Rusizi, Nyamasheke and Rubavu in December 2011

7. Surveillance of vaccine preventable diseases (VPD)

Vaccine preventable diseases Surveillance system, in Rwanda, is targeting measles, polio, Neo Natal tetanus (NNT), rotavirus and Paediatric Bacterial Meningitis (PBM) and is integrated with other diseases surveillance which report cases and deaths to the Epidemic surveillance and response division (ESRD)/Rwanda Biomedical Centre (RBC).

At the national level, there is 1 national VPD surveillance officer with clear terms of reference who give technical support to health facilities in terms of VPD surveillance activities through supportive supervisions and trainings.
Two national laboratories; national reference laboratory and laboratory of Kigali Teaching Hospital, and one regional laboratory, Uganda virology research Institute , are parts of the VPD surveillance system by supporting sample analysis for measles, rotavirus, PBM and polio.

At district and health centre levels, there are EPI focal points responsible for coordinating immunization activities including active VPD surveillance in the catchment area.
At community level, the community health workers, based in the villages, are playing an important role in detecting and reporting targeted VPDs to the health facilities.

Two types of surveillance are conducted in Rwanda EPI, namely case-based surveillance and sentinel site surveillance.Case-based surveillance concerns measles, polio through acute flaccid paralysis (AFP) and NNT diseases on one hand and, sentinel site surveillance deals with rotavirus, PBM and congenital rubella syndrome on the other hand. The reporting system of VPDs is organized from the community level up to the national level.
At community level, community health workers are trained in case detection and reporting. When a suspected case is detected in the community, CHW notifies the case to the nearest health facility.
Once the CHW notifies a suspected case, a health care provider from the HC conducts a visit in the community to verify if the case meets case definition and then conduct investigation using appropriate forms and collect sample if applicable. The sample collected and the investigation forms well filled are sent to the district hospital level.
The district hospital, in turn, sends the investigation forms and sample collected to the national EPI from where they are channelled to the appropriate laboratories.
For measles surveillance, the serum collected is sent to the national reference laboratory while for AFP surveillance, the stool specimen are sent to Uganda virology research laboratory via DHL..

For diseases under sentinel site surveillance (rotavirus and PBM), samples are sent to Kigali Teaching Hospital for analysis.
The results from different laboratories are shared with national EPI surveillance team and districts. The national VPD surveillance officer enters the data in the appropriate databases and share with Ministry of health and WHO on weekly basis.

VPD surveillance performance is monitored through core indicators presented in the following table.

Table 05: Surveillance indicators for Vaccine Preventable Diseases, 2005-2016

		Years											
Diseases	**Indicators**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Polio	No polio AFP rate (2 cases/100,000 people < 15yr)	1.9	2.25	2.65	2.4	3.6	3.2	2.6	3.3	3.4	2.79	3.26	3.43
	WPV	0	0	0	0	0	0	0	0	0	0	0	0
Measles	% districts with suspected measles cases	50%	93%	90%	80%	93.3%	100%	100%	100%	100%	100%	100%	100%
	# lab confirmed cases	25	43	13	5	5	55	23	23	17	10	1	55
Rubella	Confirmed cases	NA	NA	4	37	36	36	62	173	50	15	1	15
	CRS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	0
NNT	# of NNT cases	4	2	1	1	0	0	1	0	0	0	0	0
	Incidence <1 cases/1000 live births	< 1	< 1	< 1	< 1	< 1	<1	<1	<1	<1	<1	<1	<1
Diarrhoea	Diarrhoea cases with stool samples	NA	NA	NA	NA	NA	32	260	587	977	720	535	164
	Rotavirus +	NA	NA	NA	NA	NA	10	133	196	207	137	104	57

Rwanda is on track to meet global objectives in terms of control/elimination and eradication of targeted VPDs.

In fact, in 2004, the country has eliminated neonatal tetanus and has documented no in-country wild poliovirus circulation.
Concerning polio eradication initiative, three committees (national certification committee, national polio experts committee and task force on containment) are functional and guide the national EPI on the progress towards polio eradication.

To meet the target of measles elimination in 2020, Rwanda is implementing measles elimination plan including shifting from measles case-based surveillance to measles elimination mode of surveillance.

Research and evidence generation

In addition, there are on-going studies initiated by EPI to monitor vaccines impact; namely rotavirus vaccine impact study, economic burden of diarrhea in Rwandan children under 5 years, post-marketing intussusception monitoring in Rwanda after the introduction of oral rotavirus vaccine and HPV vaccine impact study of which final results will be published in 2018 respect.

8. EPI financing

The total expenditure on health as a percentage of the total national budget was 11.5 (RDHS 2010).

Further, the heavy dependence on donor financing of the health sector creates health financing sustainability concerns. Nevertheless, the GoR is proactively supporting all sectors- including MOH- to ensure continued bolstering of the economy and progressive weaning of the country off from donor-inclined financing.

Rwandan national EPI is financed by the Government and its partners (GAVI, WHO, UNICEF, USAID). The Government already pays all the traditional vaccines and co finances the new and under used vaccines. GAVI supports all new vaccines by financing 90% of the total cost. Currently, these new vaccines include DPT-HepB-Hib, PCV13, Rotavirus Vaccine and HPV vaccine.

8.1 Support for vaccines cost

GAVI alliance is the main partner financing the National EPI in area of vaccines costs. There is a partnership between the government of Rwanda and GAVI alliance and is defined in partnership framework agreement signed by both sides in June 2013, this agreement between GAVI and GoR it is a continuous because even before 2013 GAVI used to support Government of Rwanda through Ministry of Health by providing:

- Routine Immunization strengthening support (The 1st support was given in 2000)
- New Vaccine Introduction support and financing of new vaccine.
- Injections safety

8.2 Health System strengthening support

HSS is one of GAVI funded project (2013-2017) which has components to impact on EPI funding. From 2006 GAVI started to support Health System Strengthening. In 2013, Ministry of Health submitted a proposal to GAVI to support HSS and the total amount of 10,339,670 USD was approved by GAVI. The approved HSS Support will be given to Rwanda for 5 years from 2013-2017. The first year Rwanda obtained 2,464,199 USD, normally the first year was supposed to start in July 2013 and end in June 2014 but there was a delay in funds transfer and we obtained cash in our account on 26 February 2014.

New Vaccine Introduction support

Rwanda has introduced new vaccines subject to co financing. These vaccines were purchased through GAVI support:

- Pentavalent vaccine (DPT-HepB-Hib) from 2002 to 2012 with a cost of 38, 310, 246 USD
- PCV-13 support, from 2009 to 2012 with a cost of 16, 342,718 USD
- Rotavirus Vaccine Support (2012) with a cost of 6,882,500 US

The table below shows GAVI support and GoR co financing for new vaccine and underused vaccines.

Table 06: GAVI support and GoR co financing 2013-2016

Vaccines	Year 2013			Year 2014			Year 2015			Year 2016		
	GAVI	GoR Co-Financing	% of Co-financing	GAVI	GoR Co-Financing	% of Co-financing	GAVI	Co-Financing	% of Co-financing	GAVI	Co-Financing	% of Co-financing
Pentavalent vaccine	1,853,000	169,500	9%	2,702,000	195,144	7%	$ 2,036,500	$ 424,500	21%	$ 1,909,000	$ 435,500	23%
PCV-13	3,522,000	119,000	3%	6,573,500	148,500	2%	$ 4,091,000	$ 373,000	9%	$ 3,521,500	$ 269,500	8%
Rotavirus vaccine	6,463,500	186,500	3%	6,661,000	123,750	2%	$ 2,247,000	$ 160,500	7%	$ 5,268,500	$ 240,000	5%
HPV vaccine	0	0	0%	2,128,000	122,400	6%	$ 1,408,000	$ 62,500	4%	$ 507,500	$ 136,000	27%
Total	11,838,500	475,000	4%	18,064,500	589,794	3%	$ 9,782,500	$ 1,020,500	10%	$ 11,206,500	$ 1,081,000	10%

Financing traditional vaccines (100% GOR)

The Government pays all the traditional vaccines of routine immunization which currently include BCG; OPV; MCV, TT vaccine and other non routine vaccines (Rabies vaccine, yellow fever vaccine, meningitis vaccine, HpB for adults.

The table below shows the GoR expenditure on routine and non routine vaccine in 2013 and 2014.

Table 07: GoR expenditure on routine and non routine vaccine in 2011 and 2015

Immunisation financing

	2011	2012	2013	2014	2015
Vaccines used in routine immunisation					
- Government expenditure	$ 1,313,568	$ 1,584,336	$ 1,800,309	$ 1,987,515	$ 1,970,392
- Total expenditure	$ 11,868,568	$ 18,701,836	$ 13,882,595	$ 20,052,015	$ 12,725,186
- Government as % of total	11%	8%	13%	10%	15%
Routine immunisation					
- Government expenditure	$ 2,327,804	$ 2,510,796	$ 2,564,291	$ 2,463,874	$ 5,065,955
- Total expenditure	$ 14,004,013	$ 20,555,317	$ 16,446,885	$ 23,048,495	$ 24,944,240
- Government as % of total	17%	12%	16%	11%	20%

Source: WHO-UNICEF Joint Reporting Form 2015

General government expenditure on health as a share of general government total expenditure: **10%**

Source: WHO National Health Accounts, 2014

Expenditure on routine immunisation in 2015

Other sources of funding of EPI

Other sources of funding for National EPI include WHO (Monitoring and Evaluation training support), UNICEF (Cold chain and supply) and USAID.

Financing EPI at peripheral level

Basing on RED strategy introduced in Rwanda in 2005, EPI national level finances district Hospitals in order to reduce VPD mortality and morbidity in under 1 year children. This financing is made to strengthen routine immunization, to improve performance indicators of surveillance of VPDs and to strengthen social mobilization activities.

9. Programme Monitoring and evaluation

EPI program is monitored and evaluated basing on the existing plan of actions using different mechanisms such as reporting, supervisions, coordination meetings, reviews and surveys.

The operational level for immunization services is mainly health centers and health posts including both public and private. The collection of individual data is conducted at this level using standardized data collection tools nationwide and then processed, compiled and reported to upper levels trough a web-based HMIS data base.

Supervision of EPI activities is conducted in integrated manner from central level to district hospitals and district to health centers using an integrated supervisory check list which includes immunization and VPD surveillance component. For special EPI events like new vaccine introduction or maternal health weeks, EPI staff conducts specific supervisions.

The community health workers under supervision of health centers play an important role in supporting the monitoring and evaluation of EPI activities in the country since they are present in every village. They collect information from their community on vaccination activities and VPDs like defaulter tracking and VPD cases detection and notification.

Vaccination activities are regularly assessed through quarterly coordination and feedback meetings held between central and district hospital levels. Also, district hospitals hold monthly coordination meetings with health centres where vaccination indicators are discussed.
Twice a year, the district hospital managers hold a coordination meeting with district administrative authorities to monitor the level of achievements of targeted indicators.

Apart from routine evaluation, EPI conducts surveys such as PIE for newly introduced vaccines, EPI Coverage survey, EVMA and cold chain assessment. In 2014, Rwanda has conducted a comprehensive EPI review to assess the status, functionality, and efficiency of routine immunization, surveillance systems, their operational components and to identify internal and external factors that should impact the program.

The national EPI has international partners with whom regular reports are shared; MoH/ WHO/UNICEF joint reporting form (JRF) and GAVI Annual progress report (APR). To monitor VPD surveillance and routine immunization indicators, EPI shares on weekly and monthly basis database with partners.

10. EPI Partnership

Since 1996, EPI has had a functioning Interagency Coordinating Committee (ICC). This group includes senior officials from the Ministry of Health, representatives from different local and international partners. The ICC for immunization is active and, above all, plays a technical and advocacy role in support of the program. ICC meetings are regularly held and their proceedings are approved through formal written minutes.

The EPI works in close collaboration with other divisions and programs of RBC/Ministry of Health, as well as with districts.

The program also maintains partnerships with different ministries, seeking their engagement in social mobilization, especially for national or local vaccination campaigns. Local NGOs also partner with the programme in the area of social mobilization. At the community level, the program supports a network of community health workers whose assistance is increasingly relied

upon, particularly in the areas of community sensitization and reduction of immunization drop-out rates.

II. Immunization programme situation analysis

The vaccine Preventable Diseases Program is composed of many immunization operations and activities are carried out at different levels of the health system. Main operations are the following:

- Immunization Service delivery
- Cold chain and supply chain of vaccine and vaccines devices
- Surveillance of VPD
- Immunization Communication strategies
- EPI Management
- Immunization financing and sustainability
- Capacity Building
- EPI Monitoring and Evaluation

In this section, the analysis was conducted using SWOT analysis method to orient the development of 2015-2019 cMYP. The identification of all stakeholders in immunization program was also done to make sure the implementation of planned activities in c MYP will be performed in smooth way by mobilizing funds and take into consideration of all immunization partners' views.

1. SWOT analysis

The following table is illustrating the analysis of Strengths, Weaknesses, Opportunities and Threats regarding the Vaccination Program:

a) **Strengths and Weaknesses within the Vaccination Program**

STRENGTHS	**WEAKNESSES**
I. Immunization Service delivery	
1. 97% of Districts reported immunization coverage of Penta 3 > 80% in 2013. 2. High coverage achieved for most of antigens of the program and maintained over the time (> 80%). 3. High coverage achieved during the SIAs in 2013: MR coverage 97.5%, HPV vaccination coverage: 90% (ICS 2013) , 4. From 2007-2013, all districts were well performing with respect to drop-out indicator (Penta1-Penta3 <10%)	1. Denominator issue is reported in some districts where the coverage is exceeding 100%(underestimation of the denominator) 2. RED/REC not fully implemented in health facilities 3. One District of Nyamagabe reported the immunization coverage of penta3 below 80%, in 2013.

STRENGTHS	WEAKNESSES
5. HPV vaccine introduced successfully in routine immunization 6. The MoH/VPDP developed good strategies and clear actions to enhance completion of HPV vaccine 3-dose schedule which included the collaboration with key stakeholder (MINEDUC and other partners) 7. Immunization services included in Minimum package of Health centers and are integrated with other health interventions. 8. Twelve antigens are being utilized in Routine Immunization and Measles vaccine second dose was introduced in Routine Immunization in 2014 9. Private clinics with support of Vaccine Preventable Diseases Program (VPDP) are offering immunization sevices. 10. Community Health Workers play an important role in Immunization services by helping health workers in defaulters tracing, social mobilization and registration of infant in villages. 11. Immunization data collection tools are standalized and utilized in all health facilities offering immunization services.	
II. Cold chain and supply chain of vaccine and vaccines devices **III.**	
1. No vaccine stock-out was reported at all levels in 5 past years 2. All the traditional vaccines are purchased by the Government through UNICEF channel 3. New and underused vaccines are effectively co-financed by Government and GAVI Alliance 4. Vaccines are kept at WHO required storage conditions 5. Health districts (district hospitals)	1. NRA not yet operational to assess vaccine safety in the country 2. Vaccine over stock at the central level for some antigens (Rotavirus vaccine) 3. Vaccine forecasting system poses some problems at all levels 4. Stock Management Tool (SMT) not utilized at District level 4. SMT used at central level do not facilitate the good management of

STRENGTHS	WEAKNESSES
and health facilities collect vaccines actively from the higher level (pull system) 6. Availability of computerized vaccine and supply stock management tools (SMT Tool) at central level	vaccines. It requires long time manual data entry and it is not web based. 5. Lack of automatic tool for vaccine management (Scan) 6. All Districts are obliged to collect vaccines from central level; there is a need to install new cold rooms at provinciallevels.
7. Correct application of MDV policy 8. Implementation of wastage monitoring principle 9. Use of VVM indicator for all antigens exept Rotavirus vaccine availbale in the country. 10. Correct distribution of vaccine and diluent based on the bundling principle 11. Temperature monitoring and follow up is done twice a day. 12. All health facilities offering immunization services are using accredited refrigerators 13. 70% of public health facilities offering immunization services are connected to national electricity grid. 14. Over 80% of health facilities have got adequate vaccines and vaccine devices storage capacity 15. Enough space to accomodate new cold rooms at central level The system for monitoring and repoting wastage of vaccines is in place and operational.	7. Continuous temperature monitoring devices (Fridge-Tag) are missing in some health facilities. 8. 9. Some Health facilities do not have enough and regular vaccine transport facilities. 10. The preventive maintenance of cold chain equipment is not properly done at all levels 11. Lack of spare parts for some cold chain equipments (Dometic TCW 2000) 12. Lack of implementation plan of Refrigerators preventive maintenance at District Hospital 13. Insuffiscient vaccine storage capacity at central level
III. Surveillance of VPD	
1. Surveillance system for VPD is in place at all levels and is functionning, all HF are included in the surveillance network.	1. No prioritization of surveillance sites and insufficients Field visits to

STRENGTHS	WEAKNESSES
2. Rwanda has documented absence of WPV circulation since 2004, and last WPV case notified 1993 3. MNT elimination goal achieved and sustained since 2004 4. Major Performance indicators of Mesales surveillance achieved for many years (Since 2005) 5. Measles, neonatal tetanus and wild polio virus are reported directly to EPI in order to avoid delay in decision making process (in case of outbreak) 6. Coordination meetings are held between VPDP and others services dealing with surveillance activities 7. Country initiated paediatric bacterial meningitis surveillance since 2002 and continues to function in Kigali Teaching Hospital 8. Rotavirus surveillance is now integrated in8 sentinel sites 9. AEFI surveillance officer recruted for stregnthening AEFI monitoring. 10. Measles elimination mode has been established in Rwanda and will be operational in 2015 11. Congenital Rubella Syndrome Sentinel site surveillance to be operational in 2015 12. HPV vaccine impact study in Nyarugenge District initiated in 2013.	surveillance sites 2. Active surveillance not perfomed in health centers. 3. Discrepencies in reported VPD cases In HMIS, IDSR and VPDP records 4. Gaps in VPD cases definition and core indicators in some health facilities 5. Surveillance activities poorly highlighted in operational plan at health facility levels
IV. Immunization Communication strategies	
1. Existence of Rwanda health communication Centre which assists health programs with communication/social mobilization activities 2. Existence of integrated Health communication strategic plan 3. 4. Existence of NGOs working with communities in terms of health	6. Outdated education/Communication materials on Immunization 7. Communication activities not highlighted enough in operational plan at all levels 8. Parents and caregivers do not have

STRENGTHS	WEAKNESSES
communication 5. About 45,000 community health workers work at the village level to promote health and especially immunization activities. Among the three available CHWs there is 1 in charge of MCH 6. Existence of communication subcommittee which developed key messages to address concerns of parents for new vaccine introduction 7. Health education is held before the immunization sessions in all health facilities. 8.	enough knowledge on new vaccines
V. EPI Planning, Management, coordinadtion and administration	
1. Existence of a national planning process within the MoH/RBC 2. Existence of micro planning process at the district hospital level 3. Existence of operational ICC for immunization at the national level 4. Regular monthly management review meeting at District levels and central level 5. Existence of EPI structure 6. Existence of active EPI partners 7.	1. Insuffiscient staff at VPDP level 2. The current VPDP structure is inadequate
VI. Capacity building	
1. 2. Trainings of health professionals are conducted prior to new vaccines introduction 3. Supportive supervision visits are conducted at all levels of health system 4. New vacines introduction is used as an opportunity to improve the knowledge of health workers and CHWs on immunization 5. Availability of reference documents in immunization services (EPI	1. Lack of continuous capacity building plan at all levels. 2. Lack of database of trained staff at levels 3. Lack of knowledge in communication skills for staff in charge of vaccination at operational level 4. No integration of Immunization course in college of Medecine and Health sciences curriculum 5. Outdated EPI training module

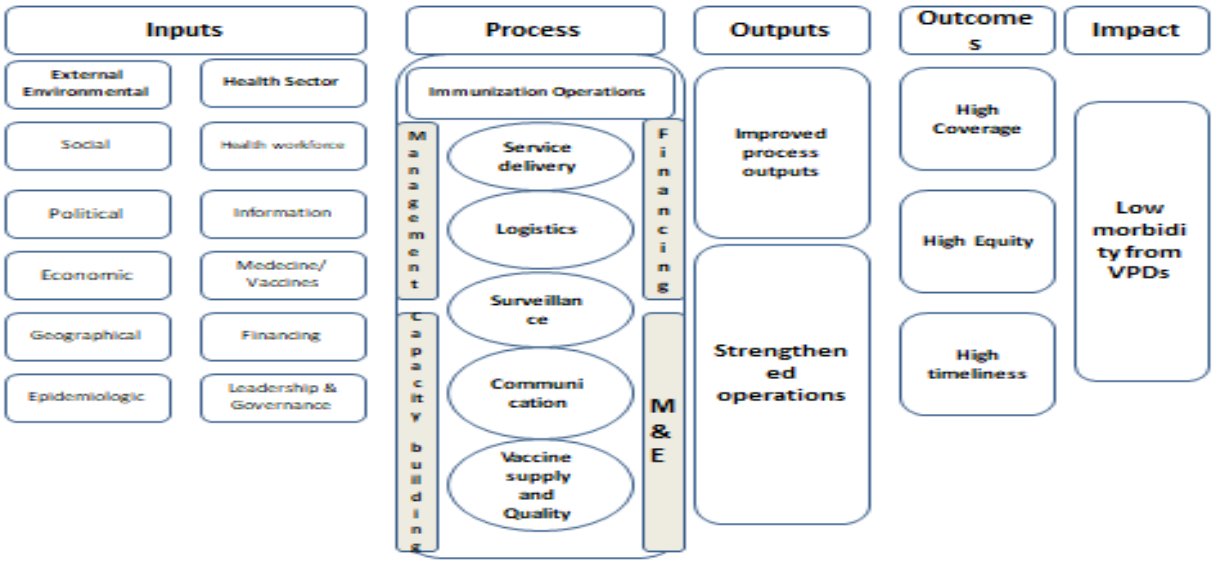
STRENGTHS	WEAKNESSES
Guideline, etc) 6. Qualified and Trained of Existing EPI staff and availability of clear written terms of reference 7. GoR through Ministry of Health is suppoting staff for Master's program 8. At least 2 staff at Distrit Hospital level are trained on MLM and RED	
VII. Finance	
1. GoR finance is annually guaranted and constantly increased over the years to support vaccines procurement 2. Financial support from the international partners for immunization is available 3. PBF is provided as an incentive according to performance at all levels.	1. Insuffiscient funds to carry out immunization activities at operational level. 2. Low domestic funds to ensure sustainability of new vaccines procurement 3. Insufficient local funds mobilization
VIII. Monitoring, supervision and Evaluation	
1. Standard data collection and reporting tools are used in all health facilities 2. Availability of M&E unit in MoH/RBC working closely with VPDP 3. Supportive Supervision conducted at least on quarterly basis at all levels 4. Different reviews are conducted in EPI (Cold chain equipment assessment, Effective vaccine management assessment , EPI reviews, Immunization coverage survey, etc)	1. DVDMT not yet utilized at District level 2. Data quality not suffiscient at peripheral level 3. Insuffiscient Documentation/ Research of best practices and/ challenges occured in immunization services are not very well documented 4. EPI data collection tools (tally sheets, monthly reports) do not include VPDsurveillance data Data analysis is done but the actions are not taken to address the identified issues (Monitoring for action)
Infrastructure and Equipment	
1. All vaccination services located in different health facilities have at least one room dedicated to immunization services 2. According to the CCEA conducted in December 2013,	1. Most of health facilities do not have enough space for vaccination activities 2. Around 400 refrigerators are or will be obsolate during the period of this

STRENGTHS	WEAKNESSES
all Vaccination services in health facilities are equiped with standards refrigerators	c MYP 3. Most of health facilities do not have transport means for vaccine and vaccine and vaccines devices supply 4. Community Health workers do not have means of transport to follow up drop outs children in villages. 5. Vaccination services are not computerized. 6. Insuffiscient refrigerated vehicles for vaccine supply to Districts.

b) Opportunities and Threats

OPPORTUNITIES	THREATS
1. Opportunity offered by GAVI to support countries with more new and underused vaccines, NVS and HSS 2. Availability of partners ready to support immunization services (WHO, UNICEF, USAID etc) 3. Window of mobilizing funds from local partners to support immunization activities	1. Global economic crisis affecting financial support from donors 2. Rwanda immunization program is relaying on external funds at 90% 3. Risk of VPD and other epidemic infectious diseases importation 4. Political conflict and Natural disters in the region 3. Rwanda National EPI do not have permanent location 5.

Priority activities of this cMYP will be based on identified weaknesses and threats taking into consideration current strenghts and opportunities to reinforce the following immunizations operations:



2. Stakeholder analysis

Stakeholder's analysis method was used to identify immunization program active supporters as well as passive (Potential) supporters. Active supporters of immunization program are defined as all Organization (National or international) , institution or individuals who give any support either financial, technical, vaccines, equipment or advocacy for improvement of immunization activities (Most of them are ICC members) while passive supporters are those one willing or ready to support in any activity of the program in case they are approached and interested. The

specificity of Immunization program in Rwanda is that there is no resisters or group anti vaccination identified up to now at all levels.

For this reason the following table shows the partnership between VPDP and all stakeholders public or private involved in immunization activities. The involvement level of immunization partners is quite different depending on the role played by each other. The main support is given by GoR and GAVI alliance which are procuring or co-financing all vaccines used in immunization program.

Public	**International organizations/NGOs/UN Agencies/ Local Associations**	**Private sector/FBO/Individuals**
Active Supporters		
MoH	GAVI	FBO
RBC Management/ RBC Divisions	WHO	Private clinics
MINEDUC and UR/College of Medecine and Health Sciences	UNICEF	Private pharmacies
MINALOC and Districts	USAID	
NISR	URUNANA DC	
MINECOFIN	PRO FEMMES TWESE HAMWE	
RBA	RED CROSS	
MIGEPROF	ROTARY INTERANTIONAL	
RBS	UNFPA	
Directorate of Migration	Imbuto Foundation	
	BUFMAR	
	PATH	
	Rwanda Pediatric Aassociation	
Potential Supporters		
MoD	JICA	PSF (Communicaction Companies, Private Radios, Banks, insurance companies, Industries, ...)
RNP	Suise Cooperation	Local Artists
MIDIMAR	BTC	
MINAGRI	Society for Family Health	
Rwandair	Access Project	
RSSB	PIH	
	World Vision	

IX. Comprehensive Multi Year Plan Objectives, Strategies and activities

Objective 1:

To strengthen the logistics and supply chain management capacity of the national EPI to effectively sustain optimal stock levels of vaccines and vaccine commodities at all levels of the health system

Strategy 1.1: Improve the forecasting and distribution of vaccines, other vaccines related Products and recording documents at National and District levels

Vaccine and other vaccine products procurement, supply and recordings should be done following standards to fill out the gap identified.

Activity 1.1.1: Order and supply bundled vaccines (Vaccines, AD syringes and safety boxes) (Type and quantity: To be seen on the Annex):

Routine immunization Vaccines are procured twice a year for each antigen and sometimes more than two shipments according to the volume of antigen to be procured. GoR is buying all traditional vaccines at 100% while new vaccines are co-financed by GoR and GAVI alliance. Procurement is done through UNICEF and the Supply is done to districts on monthly basis using pulling system.

Activity 1.1.2: Quantification HepB, Yellow Fever, antirabies Vaccines (Quantity to be determined):

Yellow fever vaccine is provided to travellers and the quantity to be procured is determined according to the previous consumptions. Normally Hepatitis B vaccine is included in Routine vaccines but the VPDP decided to avail Hepatitis B vaccines for the general population who did not receive Hepatitis B in routine immunization. The VPDP has the mandate of availing all needed vaccines by the general population which include Meningitis vaccines and Anti rabies vaccines. The list of other vaccines can be increased depending on demand. **Activity 1.1.4: Provide two additional refrigerator vehicles to national EPI:**

VPDP has one refrigerated vehicle to supply vaccines in different regions of the country in case of need but the assessment has found out that the second vehicle is needed to cover the whole country

Activity 1.1.5: Procure 500 Motorcycles for health centers to conduct outreach vaccination sessions:

Vaccination activities are conducted countrywide using different strategies which include Vaccination at outreach sites. Motocycles are needed to facilitate health facilities to carry out outreach services and also vaccines supply from District to health centers or from HC to vaccination points.

Activity 1.1.6: Hiring dry store for 5 years to accommodate vaccine related materials:

Dry store is needed to accommodate all materials distributed to health facilities such as syringes, refritgerators, data collection tools, etc.

Activity 1.1.7: Provide cold boxes and vaccine carriers for Hospitals and Health Centers:
Vaccines are transported in cold boxes and vaccine carriers. VPDP is planning to provide to Health facilities new means of vaccine transportation; cold boxes at District Hospital levels and vaccine carriers at health center levels.

Activity 1.1.8: Provide to HFs vaccine recording tools:
Vaccinate children is good but also the informations have to be collected and kept properly, VPDP will produce all needed tools to make sure the high quality of data is ensured and used tools are standards (child vaccination cards, vaccination registers, tally sheets, temperature registers, stock registers, vaccines management registers)

Activity 1.1.9: Purchase 2 operation vehicles for Vaccine and vaccine devices distribution and supervision of vaccination activities.
During the period of this cMYP, Vaccine Preventable Diseases Program will purchase two new operation vehicles for Vaccine and vaccine devices distribution and supervision of vaccination activities as the available ones will be depreciated at the end of this cMYP.

Strategy 1.2: Expand the storage capacity for vaccines and other vaccines related products at National, District and Health Facility levels
There is a need of expanding the storage capacity at central level since we have more new vaccines introduced in last 5 years and we are expecting to introduce IPV in 2015.The program is also planning to procure other vaccines and vaccine products found to be needed by the population like HepB vaccine, TT serums etc. This will imply additional storage capacity. There is also a plan to install cold rooms at a provincial level considered as back up storage and this will ease the vaccine supply to DH. Refrigerators for health center level will be procured as well.

Activity 1.2.1: To provide 2 cold rooms of 40m3 at central level:

Vaccines are stored between 2 to 8 ° C and some of them below 0 ° C. The current storage capacity has demonstrated a gap which has to be filled before IPV introduction and replacement of old ones. In this regard, additional cold rooms will be needed during the period of this cMYP.

Activity 1.2.2: To provide 4 cold rooms of 40m3 at provincial level:

All Districts are obliged to come to collect vaccines and vaccine materials to central level and we have seen that collection of vaccines at central level is time consumming, using so many resources and lack of back up of vaccine storage in case there is a break down of cold roms at

central level. There is a need to install new cold rooms in provinces where nearest districts will be collecting vaccines.

Activity 1.2.3: Provide refrigerators (electricity or solar) to Hospitals and Health centers according to existing replacement plan (Quantity and type of refrigerator to be determined for each year):

Some of existing refrigerators in health facilities are obsolate others are getting older across years and need to be replaced every year.

Strategy 1.3: Improve the quality of management of vaccines and other vaccines related Products

The management of vaccines and vaccine products will imply trainings at all levels for better management of vaccines. The use of SMT at central level and DVDMT at District level is required and should be applied for better vaccine management. The required materials and equipments for cold chain will be procured, and maintenance training will be conducted.

Activity 1.3.1: Train 90 and 1000 health workers respectively from hospital level and Health Centers in vaccine forecast, vaccine stock management and vaccine wastage monitoring:

Vaccine Management is still done using traditional methods, manual recording. VPDP in collaboration with WHO has started to use SMT and the tool will be decentralized at District Level and the training will cover also basic information on vaccine management and vaccine wastage monitorring. At least 2 persons for each district hospital and health center level will be trained.

Activity 1.3.2: Train 90 cold chain technicians for maintenance of cold chain equipment:

Preventive Maintenance is one of the challenges we are facing to day. Continuous training of cold chain technicians on preventive maintenance will be privilaged to resolve the problem of cold chain equipment wich are not properly maintened.

Activity 1.3.4: Provide an automatic stock management device (Scan) at central level.

Vaccine stock management is very complex and need to pay so much attention. VPDP will introduce new technology which is aiming to strengthen the good management of vaccines.

Activity 1.3.5: Install continuous electronic temperature monitoring system at Central level: Vaccines are sensitive to temperature and very expensive. There is a need of protecting them from damage due to exposure to the temperature out of required range. To make sure of good monitoring of temperature, the installation of modern continuous electronic temperature monitoring devices is very important.

Activity 1.3.6: Provide 3000 fridge tags to monitor temperature to HCs

As explained in above activity the continuous electronic temperature monitoring should be done at all levels. Fridge tags will be procured and distributed to Health facilities to ensure the monitoring of safety of vaccines used at HF level.

Activity: 1.3.7 Provide 500 computers to health facilities for computerization of vaccination services and facilitate the use of DVDMT

Rwanda has embarked on e-health services recording and reporting for improved health services, vaccination activities are still being documented using paper-based method with known related limitations (Follow up of drop outs, missing data, insufficient data analysis and delay in decision making, lack of monitoring for action, etc). Therefore, VPDP is planning to shift from paper-based to information technoligies by providing IT equipment to all health facilities during the period of this c MYP.

Strategy 1.4: Maintain cold chain functioning

For the cold chain to be operational and sustainably work, there should be a preventive maintenance plan where all needed materials to replace the old ones will be availed and themaintenance for all equipments will need to be conducted regularly.

Activity 1.4.1: Order 144 000 liters of kerosene for 120 Health Centers using kerosene refrigerators:

Referring to the last CCA conducted in December 2013, it has demonstrated that 30% of health facilities are still using kerosene to maintain the cold chain. In this regard, we are assuming that there is a need of providing Kerosene to Health centers and the quantity of kerosene to be provided will progressively be reduced because of the increase of Health centers which will be connected to national electricity grid.

Activity 1.4.2: Provide spare parts for cold chain equipment (Quantity to be determined):

Spare parts of existing cold chain equipments are provided by VPDP, this is explained by the used refrigerators which are not available to the local market, in this regard it is the responsibility of central level to procure and avail spare parts to health facilities.

Activity 1.4.3: Avail refrigerators maintenance kits to technicians to use in daily work:

Cold chain epuipment technicians have expressed the issue of lacking kits to help them to carry out the cold chain equipment maintenance properly. So, the need of kits to help them in their daily work is very important.

Activity 1.4.4: To procure generator of 160 KVA:

National Vaccine store need a new generator of 160 KVA because of new cold rooms installed, the existing one can not run at the same time more than 6 cold rooms planned to be installed soon.

Activity 1.4.5: To procure (general) stabilizers for the central and provincial level cold rooms:

In order to prevent potential incident caused by electric circuit, National vaccine store has to be protected by installing electric stabilizers. The installation of central level general electric stabilizer will be an opportunity to install also stabilizers for provincial cold rooms planned to be installed.

Activity 1.4.6: To build 4 halls to accommodate cold rooms at provincial level:

New cold rooms to be installed at province level will require big halls, where cold rooms will be safe and very well protected from anything which can cause damage. Identified hospitals do not have free halls where cold rooms can be installed.

Activity 1.4.8: To procure 500 stabilizers for Health facilities

Refrigerators provided to Health Facilities are very expensive; therefore they have to be protected from electric choc (circuit) by providing electric stabilizers to health facilities.

Activity 1.4.9: To Install alarm fire detectors and procure 12 fire extinguishers for central and provincial levels;

Fire detectors are very important to raise the problem before the incident of fire occurs and at the same time fire extinguishers are needed to be used in case there is an incident of fire which may result to the loss of vaccines and cold chain equipment or office equipment.

Activity 1.4.10: Insurance of vaccines and equipment;

Insurance of vaccine and cold chain equipment was recommended by immunization partners, as vaccines are very expensive products, it is important to secure the availability of vaccines in case of any damage occurred in VPDP.

Strategy 1.5: Improvement of waste management

Waste management has been found to be problematic especially at central and health center level where wastes are destroyed at a high cost. Therefore the vaccination program will construct an industrial incinerator at central level and burners at health centers where found to be needed.

Activity 1.5.1: Build one industrial incinerator at central level

Central level doesn't have an incinerator; it must pay for waste management. Build an industrial incinerator would reduce expenses caused by waste management and it can be used to generate funds from different users.

Activity 1.5.2: To build burners at health facilities (Quantity to be determined).

Some health facilities don't have burners; they are obliged to take all waste to district hospital for incineration. To build burners at all health centers will facilitate them to destroy generated wastes on site which will avoid extra expenses.

Objective 2:
To put in place long-term mechanisms aiming at increasing domestic financing to enable EPI to deliver onits mandate in a more sustainable way.

Strategy 2.1: To initiate new activities aiming at increasing income generation in VPDP
As we move towards vision 2020, the country may transit from a lower income country to a middle income country. Once this will be achieved, procurement of vaccines and vaccine products will be done from ordinary budget. Since vaccine procurement is expensive, the program needs to start thinking of how to raise funds that will sustain that self-reliance.

Activity 2.1.1: Avail antirabies, TT serums and gammaglobilines in the country (Quantity to be determined):

TT serum, Antirabies serum and gammaglobilines are very often needed and unfortunetely are not available at affordable cost by the community. VPDP is willing to avail all these important products to fight against VPDs at affordable cost.

Activity 2.1.2: Introduce vaccines needed by general population at affordable cost(Hepatitis A and B, PCV23,

Hemophilus Influenza, IPV, TT vaccine, Typhoide Vaccine, MMR etc):

Despite to the rationalization of immunizing the population against VPDs, the immunization program focuses on reinforcing/increasing income generated. Therefore, the program will benefit from the vaccines introduced as they will be generating financial resources through payments.

Activity 2.1.3: Vaccination of Health science school students and health care providers at affordable cost.

It is scientifically recognized that health workers are at high risk of being contaminated while they are at work. Therefore, Students inSchools of health sciences as well as health care providers should be vaccinated at least with basic vaccines including Hepatitis B.

Activity 2.1.4: Sensitize and vaccinate staff from different institutions and campanies to against Predominant VPDs:

This one is very crucial as some staff are at risk of being contaminated and others have the potential to contaminate clients while at work place (Hotels& or cleaning companies,…). So the owners of these companies have responsibility of recruiting immunized staff.

Strategy 2.2: To moblize fund from local partners

For the program to ensure internally generated financial sustainability, engaging local partners is critical for fund mobilization. The program plans to reach out to all potential local partners that include but not limited to; public and private companies, local NGOs and civil societies.

Activity 2.2.1: Work closely with private clinics offering immunization services and request them to contribute financially to received vaccines and vaccination materials from VPDP:

These clinics normally provide immunization services to the community at a certain cost and they get vaccines and vaccines materials from the VPDP free of charge. So as they are selling, they may give a certain percentage to the VPD program.

Activity 2.2.2: Sensitization of different campanies, associations, local NGOs through PSF to participate in Vaccination activities and contribute financially to the prevention of VPD:

When these companies are sensitized and get to know the value of having an immunized population as clients of their campanies; they will therefore be mobilized to contribute in this action of protecting population from VPDs by supporting the immunization program financially to sustain its activities.

Activity 2.2.3: Collaborate with Health insurance campanies and mobilizing them to contribute financially:

Health insurance campanies are not paying vaccines for their clients and the policy of vaccination in Rwanda is defined as the vaccine is given to all eligible people free of charge in routine immunization, clients of HIC are no longer suffering much from VPDs as they are immunized. Therefore, VPDP would appreciate the active participation of HIC in vaccination activities and its sustainability.

Activity 2.2.4: Extend ICC to include PSF and involve the latter in vaccination activities planning and implementation.

This is another opportunity of mobilizing vaccination funds through private sector. The fact is obvious, they only need to know that development is based on the healthy people and through the potential and opportunity they have of meeting a big number of people, put in place the way on how people can financially support the immunization activities.

Objective 3:
To strengthen generation and utilization of strategic information for responsive management of EPI through researches and assessments. (M&E Research)

Strategy 3.1: To strengthen M&E capacity both at national and district levels
Vaccination program has over the years been successful due to consistence in close monitoring of its activities implementation and periodic internal or external evaluations. Planned robust monitoring mechanisms and evaluation will require capacity building at all levels. Capacity building will involve training M&E staffs at different levels, developing and appropriate dissemination of standardized tools. This strategy will be implemented through well thought of activities which will include supportive supervision (continuous monitoring and mentorship process), internally conducted mid-term evaluation or reviews and external evaluations.

Activity 3.1.1: To conduct supportive supervision of Vaccination activities in all 30 districts

Suporptive supervision is one of activities to be carried out by the VPDP. Vaccination program achieved high performance in the past and there is a need of sustaining what have been achieved through regular supportive supervisions from higher to lower level.

Activity 3.1.2: Conduct mid-term Review of EPI/VPDP cMYP at least once/2 year.

The Comprehensive Multi Year Plan intends to give the guidance of what will be done in 5 coming years, the mid term review will help to align the achievements and give an orientation of remaining operations to the objectives of the c MYP.

Activity 3.1.3: Conduct a comprehensive external review of immunization activities at all levels in 2018.

To ensure the implementation of planned activities, a comprehensive external review of immunization program has to be conducted to mesure the achievements and define the new baselines at all levels.

Activity 3.1.4: Produce data collection and recording tools for vaccination services.

All vaccination activities performed in health facilities have to be documented and the information has to be kept. Data collection tools will help to get reports from vaccination services and the issued interpretation and analysis will help for decision making.

Strategy 3.2: Maintain and sustain high performance of VPDP to maximize the PBF from GAVI

This c MYP will address issues around sustainability as foundation to build on sustained high program performance. For the national vaccination program to continue receiving maximum Performance Based Financing (PBF), it has to meet the two key objectives; Achieve over 90% national coverage of pentavalent3 and 90% of districts achieve more than 80% coverage of the same antigen. The program will achieve this strategy through implementation of the activities below.

Activity 3.2.1: Organize quarterly evaluation meetings between central level and the 30 districts

A quarterly meeting between VPDP and Health Facilities is very important to discuss on achievements, performance and new strategies to put in place in order to achieve more and maintain the success of vaccination services.

Activity 3.2.2: Provide financial support to Health facilities for conducting Immunization activities

Health facilities do not have enough funds to conduct vaccination activities especially supervisions, vaccine supply and to conduct outreach vaccination sessions. Provide financial support to health facilities would enable implementation of these activities.

Objective 4:
To improve community access to uptake of EPI/VPD services (REC Approach, SIAs)

Strategy 4.1: Reaching all target populations: reach out to previously under-served, hard to reach communities, in giving support and access to services.

Although the vaccination program reaches all its target population, there are areas considered hard to reach and these have been the target of outreach community activities. The current c MYP incorporates among others REC strategies to ensure that in the implementation of this current strategic plan every target population is easily accessed and reached by vaccination activities.

Activity 4.1.1: Support financially and logistic to conduct 23008 outreach activities at 481 health center levels/year.

Outreach activities are used as one of the strategies to reach all children even those ones located in hard to reach areas. Health centers need different means to perform these outreaches, VPDP mobilizes funds to support outreach vaccination sessions.

Activity 4.1.2: Support community health workers to actively participate in drop out tracing and social mobilization on vaccination.

Community Health Workers work closely with health centers to catch up drop out children in vaccination services and social mobilization on vaccination adherance. VPDP support a little a bit CHWs to motivate them to continue tracing drop out.

Activity 4.1.3: Plan and Organize follow up vaccination campaigns.

Ministry of health through VPDP conducted Measles&Rubella vaccination campaign in March 2013. As long as Measles vaccination coverage has never reached 100% and the coverage of MSD is still very low (68%) the plan of conducting a follow up campaign of under 5 children in 3 coming years would be a priority to achieve Measles elimination mode goal.

Activity 4.1.4: Use of mobile phone SMS to remind mother/guardian due dates for vaccination.

Use of mobile phone SMS is one of the method which can be used to remind parents the date of next rendez-vous to immunization service. This new technology in vaccination program will inspire to existing one used in Mother and Child Health follow up commonly known as Rapid SMS.

Activity 4.1.5: Integrate other health interventions in routine immunization services (MBZ, Vit A, Family Planning methods)

Currently, Immunization services are integrated with other health interventions such as mosquito net distribution, nutrition and child growth monitoring. It is essential to include other health interventions which were mostly used during SIAs. These will reduce the operational cost and time for both health care providers and parents/caregivers. The strategy will increase both the immunization coverage of those health interventions.

Activity 4.1.6: Purchase 2148 bicycles for CHWs coordinators at cell levels to facilitate follow up of drop outs and reports collection in villages.

Community Health Workers (CHWs) are operating in all villages and coordinated by one community health worker based on Cell level. VPDP is planning to provide bicycles to CHWs at cell level to facilitate the follow up of drop outs and collecting reports from villages.

Activity 4.1.7: **Document the feasability, design and Initiate the center of excellence in vaccination services at central level (VPDP) and a model center of vaccination services in each district hospital catchment area.**

Vaccination services are included in Minimum package of Health center. VPDP is willing to improve the quality of vaccination services delivery by creating a center of excellence in Kigali city and model center in districts where other health facilities will be trained.

Strategy 4.2: Supportive supervision: providing local staff with on-site training by supervisors.
Providing technical supportive supervision to districts and districts in return provide it to health centres is crucial to scale up and sustain performance as there is continued onsite skills development. The implementation of this strategy will involve refresher courses, well-structured orientation program for new staff who will join the program especially program focal persons at various levels of health care system and the actual quarterly facility supervision.

Activity 4.2.1: Conduct supportive supervision from central level to District hospital at quarterly basis.
Supportive supervisions help to identify gaps in implementation of vaccination activities. By supervising health care providers on site training are conducted to increase the knowledge and capacity on specific subjects.

Activity 4.2.3: Provide refresher training to at least 2 Health care providers in charge of vaccination activities in Health facilities.

In 2012, VPDP in collaboration with UNICEF conducted training on RED strategies but different reviews recommended that there is a gap in microplanning at health facility level. In this regard, VPDP is planning to conduct refresher training on RED/REC strategies.

Activity 4.2.4: Provide induction courses/orientaion interneship to new EPI focal points at DHs within the VPDP
There is a need of orientation, Most of EPI focal points staff are not trained and they need to be trained about immunization activities and others related activities ,so VPDP plan to give them an internship within the program.

Strategy 4.4: New vaccine introduction and other vaccine products

The program is planning to introduce new vaccines and vaccine products to widen the scope of VPD prevention. To maximize reduction of morbidity and mortality related to VPD that are not currently included in the routine vaccination, new vaccines and vaccine products will be introduced. Despite previous success that's being built on, procurement of vaccine products like Immunoglobulins was not being done. Current c MYP targets to provide the population with complete package, to avoid vaccine derived polio virus IPV will be introduced in addition to OPV and new vaccines that have not been in routine vaccination will be progressively introduced. Earlier c MYPs prioritized routine child hood VPDs with good vaccination coverage over the years, the program therefore recognizes other high risk populations are target for the new vaccines to be introduced.

Activity 4.4.1: Introduce Inactivated polio vaccine (IPV) in Routine immunization.
By 2015, Ministry of Health through VPDP is plannig to introduce Inactivated Polio Vaccine (IPV) in Routine immunization. So many activities are planned to be carried out prior to the introduction such as training to HCP, updating data collection tools, to conduct IPV acceptability study, etc.

Activity 4.4.2: Avail anti rabies, TT serums and Immunoglobulin for Hepatitis B.
Both anti rabies and TT serums, immunoglobulin for hepatitis B are needed because of the high demand and the trends of diseases targeted by those products.

Objective 5:
To reinforce the capacity of VPD Surveillance and AEFIs Surveillance at all levels (Surveillance)

Strategy 5.1: Reinforce AFP case-based surveillance at all levels
Although the last case of Polio was last documented in 1993, a strong surveillance system was put in place to proactively look out for any danger from new cases. The program is tirelessly working towards polio eradication and this can only be achieved through strong surveillance system. The strategy will be implemented through staff capacity building, strengthening polio eradication commit and community sensitization to enhance suspected cases reporting.

Activity 5.1.1: Conduct/facilitate training on AFP detection, investigation and reporting using updated documents and materials:

AFP case-based surveillance has to be reinforced at all levels. This requires an updating of AFP surveillance documents and materials. Staff at all levels has to be trained on detection, investigation and reporting.

Activity 5.1.2: Facilitate health facilities to conduct a training of 45000 CHWs on early detection of VPDs, AEFIs and reporting

Case definitionS have to be well explained to all 45000 CHWs so they continue sensitization and will help in early detection and reporting.

Activity 5.1.2: Support operational plan for polio eradication committees (to include containment activities):

As Rwanda documented absence of WPV circulation since 2004 and notified last WPV case 1993, operational plans for committees at different levels have to be supported in next coming 5 years for complete polio eradication.

Strategy 5.2: Implement measles/rubella elimination surveillance model

The new surveillance model to enable the program eliminate measles will be implemented in this new c MYP to reinforce on going activities on Measles elimination. Although cases detected have been <1/1,000,000 population, the program envisage to limit the numbers of new measles and congenital rubella cases to undetectable. The new pragmatic model will involve staff capacity building through training, monitoring incidence CRS by setting up sentinel sites and strengthening ongoing measles surveillance system.

Activity 5.2.1: Conduct/facilitate training on measles/rubella detection, investigation and reporting using updated documents and materials:

Implementation of measles/rubella elimination surveillance model requires updated surveillance documents and materials for staff training at all levels on measles elimination surveillance. An update situation of measles surveillance activities has to be documented and disseminated.

Activity 5.2.2: Support the implementation of CRS sentinel surveillance:

Muhima DH is the only one CRS sentinel site which needs enough support for implementation of CRS surveillance.

Strategy 5.3: Reinforce NRL capacities to ensure the quality of lab tests

To enhance VPDs surveillance, laboratory quality control is indispensable. In this c MYP National Referral Laboratory will be supported to sharpen its quality control mechanism to ensure that tests performed are credible and reliable and be at the edge of adapting new technologies that will emerge. The activities to implement this strategy will involve selected staff training, procurement of necessary equipments, materials and reagents.

Activity 5.3.1: To facilitate the training for 4 NRL staff on new technologies and provide lab equipments, materials and reagents:

Measles and rubella surveillance needs various lab testing methods, therefore NRL staff need to be trained on new lab technologies and equipment, materials as well as reagents should be provided.

Activity 5.3.2: Conduct sensitization meeting for health care providers on MNT surveillance activities.

To reinforce the MNT surveillance system, a strong sensitization and refresher training need to be conducted to health care providers for sustainability of MNT elimination status.

Activity 5.3.3: Conduct review to update the MNT elimination status:

Since the program is in the elimination phase of MNT for about 10 years, there is need to conduct an evaluation to make sure if the surveillance system is working actively. Consequently, this will enable us to know how far the MNT elimination status stands.

Strategy 5.4: To document AEFIs for responsive actions

AEFIs surveillance has been previously weak at peripheral levels, more effort is needed to have it actively operational. In this c MYP AEFIs' surveillance has been given adequate consideration to ensure the program effectively monitors and appropriately responds to AEFIs presented. Key activities to implement the strategy will involve development of guidelines, investigation tools review of current database, training of health workers on AEFIs monitoring and management.

Activity 5.4.1: Organize a workshop to update/ develop AEFI's guidelines, other investigation tools and review of current AEFI's database.

The AEFI's surveillance has been working passively for years, there is need to strengthen this system at lower levels and for this reason, a workshop will be organized to develop guideline and update the tools. The existing database also should be reviewed.

Activity **5.4.2: To conduct cascade training of health workers on AEFI's monitoring and management**

Vaccination activities are continuously done at fixed sites as well as in outreach sites. AEFI's may occur at any place and any time, for this reason health care providers and CHWs will be trained on AEFI's monitoring and management.

Strategy 5.5: Involve community in the VPD and AEFIs surveillance

Involvement of community in AEFIs monitoring is an integral part of effective monitoring. The program plans to exploit the use of CHWs and caregiver's health education during vaccination to implement the strategy. CHWs will be sensitized and educated on the follow up, detection and reporting for any AEFIs from vaccinated children.

Activity 5.5.1: Conduct sensitization of 45000CHWs on early VPD and AEFI's cases detection and reporting.

In last past 5 years, Rwanda introduced 4 new vaccines and it is expected to introduce inactivated polio vaccine (IPV) by August 2015. In this regard, AEFI's surveillance at community level need to be reinforced by doing continuous sensitization of CHWs.

Activity 5.5.2: Provide health education materials on VPD surveillance and AFEIs monitoring and management at health facility level:

Health education materials are always needed to improve the knowledge of mothers and caregivers attending immunization services. Referring to different reviews conducted, the lack of these health education materials has been observed in most of health facilities.

Strategy 5.6: Establish an implementation follow up mechanism

A standardized monitoring of how the current c MYP surveillance strategy will be progressively monitored. A well-structured mechanism will be put in place to keep on tracking the implementation of this cMYP, key indicators will be monitored especially the involvement of community, coordination meetings and data quality audits. The strength of this c MYP relies on a solid and an effective monitoring and evaluation of activities implementation and regular standardized follow up mechanisms

Activity 5.6.1: Strengthen active surveillance of VPDs in HF and in the community.

Active surveillance is not really performed in health centers considering different review recommendations. The active surveillance has to be done by district hospital staff when visiting Health centers by cross checking notified VPDs suspected cases and OPD registers and then in the community by health centers staff in collaboration with CHWs.

Activity 5.6.2 Conduct bi-annual DQA on VPDs surveillance indicators and provide feedback to all District Hospitals.

Most of VPDs are being eliminated and the surveillance has been reinforced. The Data quality has to be conducted to ensure the sustainability of high performance of VPDs surveillance indicators.

Activity 5.6.3: Hold regular meetings for data harmonization and prepare joint report to disseminate progress on VPD surveillance and achievements:

Measles, neonatal tetanus and wild polio virus are reported directly to EPI for rapid decision making process (in case of outbreak) but suspected cases are also reported in HMIS/IDSR , So there is a need for these different departments to sit together for data harmonization and prepare a joint report on VPDs surveillance status.

Strategy 5.7: To document the impact of immunization program on VPDs

To provide sounding evidence on the impact of the current c MYP, well selected vaccine impact studies will be conducted and continued support will be given to the already ongoing studies. There is an overwhelming need to generate data, provide evidence and document the impact of c MYP implementation. This c MYP encourages all kinds of research and publication that are in line with EPI priorities and implementation impact, operational studies at lower levels are essential to inform the program uptake at community and lower levels of health care system.

Activity 5.7.2: Initiate vaccine impact studies and support ongoing vaccine impact studies.

Rwanda has been a pioneer in new vaccine introduction in African region, even though there is a lack of baseline, the impact of vaccines is not assessed, documented or published. During the period of this
cMYP VPDP is willing to conduct regular studies .

Activity 5.7.4: Produce and disseminate EPI Quarterly bulletin/articles

The status of VPDs surveillance has to be disseminated to all immunization stakeholders. This is very important to rank districts on how they are performing in VPD surveillance, the existing challenges, and new strategies and so on.

Objective 6:
To improve the quantity and quality of EPI Staff at all levels for effective and efficient delivery of EPI/VPD services (Capacity Building, Academic)

Strategy 6.1: Capacity building on new vaccine and immunization program
Capacity building is a cross cutting strategy and extends from planning to vaccine delivery. The program's philosophy is to have a competent and capable workforce right from EPI staff at national level all through to the CHWs, this way this c MYP will have assurance for implementation. The implementation activities will include organizing on job trainings, support short term courses both within and out of the country, participation in local and international conferences and development of training modules. High quality training of trainer's courses will make the implementation of this strategy cost effective and sustainable.

Activity 6.1.1: Training of 15 EPI staff and 42 EPI focal point on Vaccinology:

Conduct a training of 15 EPI staff and 42 EPI focal point on vaccinology aiming to strengthen the capacity of EPI focal point at District Hospital and EPI staff by providing a comprehensive knowledge on vaccines and VPDs.

Activity 6.1.2: Train 90 District EPI focal points on DVDMT:
VPDP is organizing training on DVDMT (District Vaccination Data Management Tool) as an international tool which helps the daily management of vaccination program by analyzing and takes actions for improving the program. It is used at District Hospital level and it can easily help to provide feedback on all aspects of vaccination program.

Activity 6.1.3: Training of 15 EPI staff and 42 EPI focal points at District Hospital level on updated MLM:

VPDP is organizing training of 15 EPI Staff and 42 EPI focal points at District Hospital level on Middle Level Managers (MLM) course.

Activity 6.1.5: To develop modules and include vaccination components in curricula of Health Science schools:

MOH/VPDP has started to advocate for including vaccination skills/course in health sciences curricula.

Activity 6.1.6: Support staffs to increase skills/qualifications (studies, short courses, trainings…)

Continuous training of EPI staff is one of the pillars of success and achievement of expected outcomes to the program.

Strategy 6.2: To increase the number of EPI staff to fill the existing gap.

To achieve EPI mission and objective goals and in particular to ensure successful implementation of this c MYP, the program proposed a new organization structure to align proposed activities with necessary workforce. Key staffing gaps were identified which needs to be bridged.

Activity 6.2.1: To recruit new xxx staff to fill the observed gap in VPDP structure:

Vaccination Program is always integrating new activities to the already existing workload and the achieved success would be sustained by increasing the number of staff. In addition during the implementation of this c MYP priorities will be put on VPDs Elimination and eradication which need so much effort.

X. Cost and funding profile

Costing the comprehensive multi-year plan for Rwanda over the period 2017 – 2021 is premised on some parameters and assumptions.

The assumptions are that the country will continue to carry the current portfolio of vaccine in the schedule, namely BCG; DTP-HpB-Hib, bOPV; Rotavirus vaccine, MR vaccine, Td vaccine, PCV-13 and HPV vaccine; and subsequently introduce IPV.

The total vaccine requirement based on projected population figures and number of doses per antigen is presented in table XX below

	2017	2018	2019	2020	2021	Total for 5 years
Population figures used	11,956,010	12,266,866	12,585,805	12,913,036	13,248,775	62,970,491
Total annual Birth cohort	358,680	368,006	377,574	387,391	397,463	1,889,115
Total annual surviving infant	347,203	356,230	365,492	374,995	384,744	1,828,663
total annual pregnant women	358,680	368,006	377,574	387,391	397,463	1,889,115
Total annual vaccine doses required, including buffer						
BCG	714,803	733,268	752,333	771,894	791,963	3,764,261
b-OPV	1,611,624	1,653,256	1,696,241	1,740,343	1,785,592	8,487,056
DTP-HepB-Hib	1,048,378	1,075,460	1,103,422	1,132,111	1,161,546	5,520,917
PCV-13	1,048,378	1,075,460	1,103,422	1,132,111	1,161,546	5,520,917
Rota_Liqu	698,919	716,973	735,615	754,741	774,364	3,680,612
MR		458,863	470,753	483,034	495,593	1,908,243
HPV	303,299	311,134	319,223	327,523	336,039	1,597,218
TT	764,495	784,244	804,634	825,555	847,019	4,025,947
IPV		498,831	371,560	381,221	391,139	1,642,751
MCV2	431,637	456,925	465,247	477,344	489,755	2,320,908

Furthermore the plans to have SIA for MR in 2017 and 2021 will require that 1,576,231 doses be procure in 2017 and 5,385,547 doses in 2021.

The cost implications of the requirement by type of antigen is presented in table xxxx below

Table……: Vaccine cost (including freight) by antigen, $US for vaccine used in Routine Immunization

	2017	2018	2019	2020	2021	Total
BCG	$100,072	$102,658	$105,327	$108,065	$110,875	$526,997
OPV	$225,627	$231,456	$237,474	$243,648	$249,983	$1,188,188
TT	$76,450	$78,424	$80,463	$82,555	$84,702	$402,594

MCV1	$232,600	$238,609	$244,813	$251,178	$257,708	$1,224,908
DPT-HepB-Hib	$891,121	$914,141	$937,909	$962,294	$987,314	$4,692,779
PCV13	$3,459,648	$3,549,017	$3,641,292	$3,735,965	$3,833,101	$18,219,023
Rota	$1,313,967	$1,347,910	$1,382,955	$1,418,912	$1,455,804	$6,919,548
HPV Vaccine	$1,364,845	$1,400,102	$1,436,505	$1,473,854	$1,597,218	$7,272,524
MR (2nd Dose)	$224,451	$237,601	$241,929	$248,219	$254,673	$1,206,873
IPV	0	$440,834	$364,129	$373,597	$383,310	$1,561,870
Total	**$7,888,782**	**$8,540,752**	**$8,672,796**	**$8,898,287**	**$9,214,688**	**$43,215,305**

On the whole it shows that in the period 2017 – 2021, Rwanda immunization programme will require US$ 43,215,305 to procure vaccines to be used in routine vaccination. When cost of vaccine handling, safe injection equipment and stock management are included; the total amount required will be US$ 45,549,405. In order to conduct the SIA as planned an additional US$5,200,903 to cover vaccine, safe equipment and antecedent vaccine management costs.

The cost profile of Rwanda Immunization programme by cost category (excluding system shared cost) is presented below

Cost category	2016	2017	2018	2019	2020	2021
	US$	US$	US$	US$	US$	US$
Traditional Vaccines	403,711.00	469,824.00	470,920.30	483,153.10	495,708.90	508,610.20
New vaccines	12,662,850.00	10,569,448.80	12,216,814.80	12,239,565.00	12,557,820.60	12,884,038.40
Injection supplies	5,126.00	5,967.00	5,978.00	6,177.00	6,309.00	6,449.00
Personnel	1,826,880.00	1,863,417.60	1,900,685.95	1,938,699.67	1,977,473.66	2,017,023.14
Transportation	30,296.35	30,902.28	61,041.03	62,261.86	63,507.09	31,327.61
Other routine recurrent costs	686,278.60	1,094,282.06	1,165,530.97	1,290,972.44	1,427,947.16	1,676,662.10
Vehicles	-	-	357,781.08	-	-	-
Other capital equipment	-	513,814.80	1,121,176.66	389,282.93	535,901.34	128,614.37
Supplemental immunization activities	-	2,054,835.37	-	-	-	8,065,597.53

Further to the partnership for immunization and the previous and anticipated funding support, the allocation of the cost over the five year period was done. This is presented below. It shows that Gavi new vaccine support continue to take the highest proportion of the funding. It is also noteworthy that Government co-financing will witness 78% increase from US$804,221.26 in 2017 to US$ 1,034,220.91 in 2021.

Secured Funding by fundling platform:					
	2017	2018	2019	2020	2021
	US$	US$	US$	US$	US$
Government	3,894,158.00	4,841,774.00	3,904,163.00	4,125,999.00	4,282,156.00
Gov. co-financing of gavi vaccine	804,221.26	829,034.32	849,573.07	871,661.97	1,034,220.91
Gavi NV support	11,820,063.00	11,387,780.00	11,389,992.00	11,686,159.00	11,849,817.00
Gavi HSS	3,361,904.00	1,383,915.00	-	-	-
Gavi PBF	984,000.00	984,000.00	-	-	-
WHO	150,640.00	-	-	-	-
Unicef	60,000.00	-	-	-	-
Total secure funding	21,074,986.26	19,426,503.32	16,143,728.07	16,683,819.97	17,166,193.91
Total resources needed:	21,074,985.42	19,690,203.63	18,883,570.04	19,590,477.26	27,851,961.18
Funding gap		263,700.30	2,739,841.97	2,906,657.29	10,685,767.27

Other funding platforms expected are the Gavi HSS and Gavi PBF as well as support from WHO and UNICEF. It is pertinent to mention that the funding gap noticeable from 2018 is on account of the unsecured nature of funding from WHO and UNICEF as the biennial programming year ends in 2017 while from 2018 the funding from Gavi HSS and PBF are classified as unsecured but probable since current Gavi HSS will be ending and the continued funding from that source will depend on the success of a successor HSS grant as well as PBF.

XI. Sustainability

Government of Rwanda is committed to universal access to quality health care and services including immunization services. Thus over the years Government has demonstrated this commitment through sustained funding of procurement of traditional vaccines, meeting her co-financing commitment to Gavi funded new vaccines and funding operational activities for delivery of vaccines. The cost and financing projections for immunization for 2017 to 2021 has been made within the overall framework of development as elaborated in the vision 2020 and the successor vision 2050 as planned.

Presented herewith are the macroeconomic parameters as well as the implications of the immunization programme planning based on the parameters

Macro-economic and sustainability indicators						
	2016	2017	2018	2019	2020	2021
Per capita	720	802	895	998	1112	1240
Total health Expenditures (THE) per capita	52	52	54	54	56	56
Population	11,553,188	11,956,010	12,266,866	12,585,805	12,913,036	13,248,775
GDP ($)	8,318,295,360	10,534,477,810	12,061,714,387	13,799,517,679	15,775,586,487	18,048,859,850
Total Health Expenditure	600,765,776	683,033,474	727,745,896	746,667,289	794,453,996	815,109,800
Government Health Expenditures	228,290,995	259,552,720	283,820,899	291,200,243	317,781,598	326,043,920
Resource requirements for immunization						
Routine and SIA (campaigns) includes vaccines and operational cost	15,615,142	19,071,086	17,299,929	16,448,315	17,103,635	25,318,322
Routine only (includes vaccines and operational costs)	15,615,142	17,016,250	17,299,929	16,448,315	17,103,635	17,252,725
Per DPT3 immunized child	$ 45.05	$ 47.44	$ 47.01	$ 43.56	$ 44.15	$ 43.41
Resource requirements for immunization as % of total Health Expenditures (THE)						
Routine and SIA (campaigns) includes vaccines and operational cost	2.6%	2.8%	2.4%	2.2%	2.2%	3.1%
Routine only (includes vaccines and operational costs)	2.6%	2.5%	2.4%	2.2%	2.2%	2.1%
Resource requirements for immunization as % of Government Health Expenditures						
Routine and SIA (campaigns) includes vaccines and operational cost	6.8%	7.3%	6.1%	5.6%	5.4%	7.8%
Routine only (includes vaccines and operational costs)	6.8%	6.6%	6.1%	5.6%	5.4%	5.3%

Resource requirements for immunization as % of GDP						
Routine and SIA (campaigns) invludes vaccines and operational cost	0.2%	0.2%	0.1%	0.1%	0.1%	0.1%
Routine only (includes vaccines and operational costs)	0.2%	0.2%	0.1%	0.1%	0.1%	0.1%
Per capita Respurce requirements for immunization						
Routine and SIA (campaigns) includes vaccines and operational cost	1.35	1.60	1.41	1.31	1.32	1.91
Routine only (includes vaccines and operational costs)	1.35	1.42	1.41	1.31	1.32	1.30

Available information from the National Health Account database (WHO) indicate that Rwanda total health expenditure per capita increased from US$44 in 2010 to US$52 in 2014 while Government General Health Expenditure (GGHE) per capita also increased from US$16 to US$20 over the same period. It is expected that the trend will continue into the future. Consequently the resource requirement for immunization which stood at 2.8% of total health expenditure in 2017 (due to the MR SIA) but generally around 2.3% in the period under consideration is not expected to constitute any stress on budget. Furthermore the percapita resource requirement averaging US$1.3 will be more than covered by the THE of over US$52 percapita. Important to mention that with decline in external resources as a percentage of THE from US$64 in 2010 to US$46 in 2014 within the overall increasing trend in government general health expenditure as a percentage of Government General Expenditure (GGE) attest to governments determination for sustainability and reduction in donor dependence. It is expected that with this trend continuing over the years, as the GNI per capita increases Government will make the required budgetary provision to eventually meet her transitioning from Gavi support at the appropriate time.

XII. Annexes

1. CMYP Costing tool