REPUBLIC OF RWANDA

MINISTRY OF HEALTH

RWANDA BIOMEDICAL CENTER
INSTITUTE OF HIV/AIDS DISEASE PREVENTION & CONTROL
VACCINE PREVENTABLE DISEASES DIVISION.

COMPREHENSIVE MULTI-YEAR PLAN
2013-2017

RWANDA BIOMEDICAL CENTER

A Healthy People. A Healthy Nation

Vaccine Preventable Diseases Division

July 2012

TABLE OF CONTENT

ACRONYMS

AD	Auto Destruct syringes
AEFI	Adverse Effects Following Immunization
AFP	Acute Flacid Paralysis
BCG	Bacille Calmette Guerin (vaccine against tuberculosis)
BCC	Behavior Changes Communication
CHU	Centre Hospitalier Universitaire
cMYP	Comprehensive Multi Year Plan
CSF	Cerebro Spinal Fluid
DPT-HepB-Hib (Penta)	Vaccine against Diphtheria, Pertussis, Tetanus, Hepatitis B and Haemophilus influezae b
EPI	Expanded Program on Immunization
GAVI	Global Alliance for Vaccine and Immunization
GDP	Gross Domestic Products
GIVS	Global Immunization Vision and Strategy
HPV	Human Papilloma Virus
ICC	Interagency Coordination Committee
ITN	Integrated treated bed Net
MDVP	Multi Dose Vial Policy
MLM	Mid-Level Management course
MNT	Maternal Neonatal Tetanus
MOH	Ministry Of Health
MR	Measles &Rubella
NGO	Non-Governmental Organization
NNT	Neo Natal Tetanus
NRA	National Regulatory Authority
OPV	Oral Polio Vaccine
OR	Operational Research
PCV	Pneumococcal Conjugate Vaccine
RBC	Rwanda Biomedical Center
RED	Reaching Every District
RGPH	Report of General Population and Habitat
RV	Rotavirus Vaccine
SIA	Supplementary Immunization Activities
TT	Toxoid Tetanus (vaccine)
UNICEF	United Nations Children's Funds
USAID	United States Agency for International Development
VPDD	Vaccine Preventable Diseases Division.
VVM	Vaccine Vial Monitor
WHO	World Health Organization
WPV	Wild Polio Virus

FOREWORD

Rwanda has taken a big step in terms of vaccination; prevention of diseases preventable by vaccination is one of priorities set by Rwanda government in order to gradually reduce infant and child mortality.

The demographic and health survey in 2010 showed that our vision of reducing the infant and child mortality is not a dream (infant mortality :from 86 deaths in 2005 to 50 deaths/1000 live births in 2010; under 5 mortality from 152 deaths in 2005 to 76 deaths/1000 live births in 2010); This is not a result of mere chance, so many things have been done to improve health of our citizens, with other interventions we have to mention introduction of new vaccines in routine immunization, supplementary immunization activities, improvement of access of child to health care using Community Health Workers during community IMCI, etc.

This revised comprehensive multi year plan of Vaccine Preventable Diseases Division 2013-2017 has taken into consideration opinions from various people and actors in immunization activities and replace the existing one in which the new vaccines were not included. The Ministry of health will ensure that all activities are being done as planned and this document will help us, as a dashboard that will also help to implement the health sector Strategic Plan III (HSSP III) at least the part on child health. The government of Rwanda through the ministry of health, expresses thanks to all stakeholders, both individuals and organizations involved in promotion of child health, together we can achieve the millennium development goals and do even more.

Dr Agnes BINAGWAHO
Minister of Health

I. INTRODUCTION

1.1 Geopolitical Background Information

Rwanda is situated in central Africa, south of the Equator, between 1°4' and 2°51' latitude South and 28°53' longitude East. With a surface area of 26,338 square kilometres, it is bordered to the North by Uganda, to the South by Burundi, to the West by the Democratic Republic of Congo, and to the East by Tanzania. Lacking access to the sea, Rwanda is land-locked and is located, as the crow flies, 1200 km from the Indian Ocean and 2000 km from the Atlantic Ocean. Its topography is mountainous and the average altitude is 1700 meters.

In terms of climate, Rwanda enjoys a temperate, sub-equatorial climate with average yearly temperatures around 18.5°C.The average annual rainfall is 1,250 millimeters, which occurs over two rainy seasons of differing lengths that alternate with one long and one short dry season. The climate varies somewhat from region to region, depending on the altitude. The volcano range and northern highlands are generally cooler and wetter, with an average temperature of 16°C and an average rainfall above 1,300 millimeters. The maximum rainfall is 1,600 millimeters above the Divide and the volcanic range. The hilly central region receives an average of 1,000 to 1,300 millimeters of rain per year, while rainfall on the eastern plateau, where the climate is relatively warmer and drier, generally falls below 1,000 millimeters and can be as low as 800 millimeters. Although Rwanda enjoys more or less constant temperatures, the climate is known to vary from year to year, with extreme variations in rainfall sometimes resulting in flooding or, more often, drought. These extremes have a profound impact on agricultural production ***(Rwanda Demographic and Health Survey, 2010).***

Administratively, Rwanda is divided into four provinces plus the city of Kigali, 30 districts, and 438 health units. The smallest administrative unit is the cell.

1.2 Socio-demographic data

According to the report from the general census of the population and habitat (RGPH), conducted in 2002, the population of Rwanda was estimated to 8,128,553 inhabitants. ***(RGPH, 2002)*** Taking into account the national population growth rate of 2.6%, the population of Rwanda was estimated to 9,981, 415 inhabitants in 2010. Projection for 2011 estimated the same population to be 10,240,932 inhabitants. The census data in 2002 indicated that 52% of the population was female and 48% of the population was male (approximately 91.5 men for every 100 women).
The majority of Rwandan populations live in rural settings (83.3%). In terms of urbanization, Rwanda has one of the least urbanized populations in Africa. However, the census figures showed that the urban population has grown rapidly, increasing from 5.5% to 16.7% of the total population from 1991 to 2002.

1.3 Organization of health services delivery system

Services are provided at different levels of the health care system (community health, health posts (HP), health centres (HC), district hospitals (DH) and referral hospitals) and by different types of providers (public, confessional, private-for-profit and NGO). At all levels, the sector is composed of administrative structures (Boards / Committees) and implementing agencies.

At village level, the Community Health Workers (CHW) are supervised administratively by those in charge of social services and technically by those in charge of health centers. CHW receive a compensation for their work from the PBF through formally established local cooperatives.

At sector level, there are HC Committees providing oversight on the work of the various units in the Health Centre, its outreach and supervision activities and general financial control.

At District level, agencies are District Hospitals (DH), pharmacies, community based health insurance (CBHI) and HIV/AIDS committees. For clinical services they report to the Director of the District Hospital. However, for administrative matters, the agencies are under the supervision of the responsible for Social Affairs of the district. Each district has a District Health Unit (DHU), being an administrative unit in charge of the provision of health services in the district and responsible for planning, monitoring, supervision of implementing agencies, intersectoral collaboration and coordination with DPs operating in the district (through the Joint Action Development Forum (JADF). The DHU is composed of two technical staff members (Planning and M&E) and reports to the responsible for Social Affairs or to the District Council if applicable.
The Director of the District Hospital reports to the DHU on the performance of the DH. Rwanda currently has 4 referral hospitals, 42 district hospitals and 438 health centers.

1.4 Vaccine Preventable Diseases Division, Organization and functionality

Due to the reform occurred in Ministry of Health as well as in other ministries of Rwanda in 2010, Rwanda Biomedical Center (RBC) gathering different programs of MoH; was created and include former EPI which is now called Vaccine Preventable Diseases Division (VPDD)

The overall goal of the national VPDD (Former EPI) is to contribute to the improved well-being of the Rwandan people through reduction of child morbidity and mortality due to vaccine-preventable diseases. Created in 1978, EPI in Rwanda became operational in 1980. It is comprised of three principal components: routine vaccination, supplemental immunization activities, and surveillance for target diseases.

Since 1996, EPI has had a functioning Interagency Coordinating Committee (ICC). This group includes senior officials from the Ministry of Health, representatives from different funding partners (WHO, UNICEF, USAID, etc.), and other parties interested in participating in this committee. The ICC remains opened to new members who have interest in joining it. The ICC for immunization is active and, above all, plays technical and advocacy role in support of the program. ICC meetings are regularly held and their proceedings are approved through formal written minutes.

The VPDD works in close collaboration with other divisions of RBC and directorates of the Ministry of Health, as well as with districts Hospitals. The program also maintains partnerships with different ministries, seeking their engagement in social mobilization, especially for national or local vaccination campaigns. At the community level, the program supports a network of community volunteers called "Community Health Workers ", whose assistance is increasingly relied upon, particularly in the areas of community sensitization and reduction of immunization drop-out rates.

Immunization activities are fully integrated into the routine health services within each health facility. Routine immunization is intended to reach all infants 0-11 months of age with nine available vaccines to protect them from the following vaccine preventable diseases (VPD) ---tuberculosis, poliomyelitis, diphtheria, neonatal tetanus, pertussis, hepatitis B, *haemophilus influenzae* type b, measles, *streptococcus pneumonia* and rotavirus infections ---. In addition, all the adolescent girls 10-14 years of age are targeted to be protected from cervical cancer with human papilloma virus vaccine (HPV) and pregnant women to be protected from tetanus, during the antenatal care visits, according to the WHO immunization schedule with toxoid tetanus (TT).

In 2002, Rwandan VPDD 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. In May 2012, VPDD introduced one more life-saving vaccine, the rotavirus vaccine, into its routine program and, finally, in 2013, measles-rubella vaccine (MR vaccine), a measles containing vaccine (MCV), will be introduced in the routine program as a second dose of measles vaccine and, to take the same opportunity of accelerating measles elimination

activities to introduce a rubella containing vaccine (RCV). With the introduction of rotavirus vaccine (introduced in 2012) and of the MR vaccine as a second dose of measles vaccine and rubella vaccine, the Rwandan immunization schedule will be as follows:

Table 01: National VPDD immunization schedule

Currently Available Vaccines		
Vaccine	**Total doses**	**Age and interval**
BCG	1	Birth
OPV	4	Birth, 6, 10, 14 weeks
DTP or DTP-HepB-Hib	3	6, 10, 14 weeks
Pneumococcal Conjugate Vaccine	3	6, 10, 14 weeks
Rotavirus vaccine[1]	3	6, 10, 14 weeks
Measles-rubella (MR vaccine)	1	9 months
Measles vaccine[2]	1	12 months
TT (pregnant women)	2	During pregnancy
HPV[3]	3	3 doses of HPV for each cohort of girls 9-14 yrs old

The Rwandan national EPI, known as a Vaccine Preventable Disease Division (VPDD) comprises a very small team of 8 technical staff and a division supportive team. The technical staffs are: EPI Coordinator and Head of the VPDD, one (1) Epidemiologist, one (1) Data Manager & Monitoring Officer, two (2) VPD Surveillance Officers, one (1) Director of immunization Unit working with a Cold Chain / vaccine storage Officer and a Storage Management / Vaccine procurement Officer, one (1) "International vaccination" Officer dealing with yellow fever vaccination for travellers. The supportive team is comprised of one Accountant, one administrative assistant, one driver and 2 Messengers. The organizational chart for the division is shown in the figure bellow.

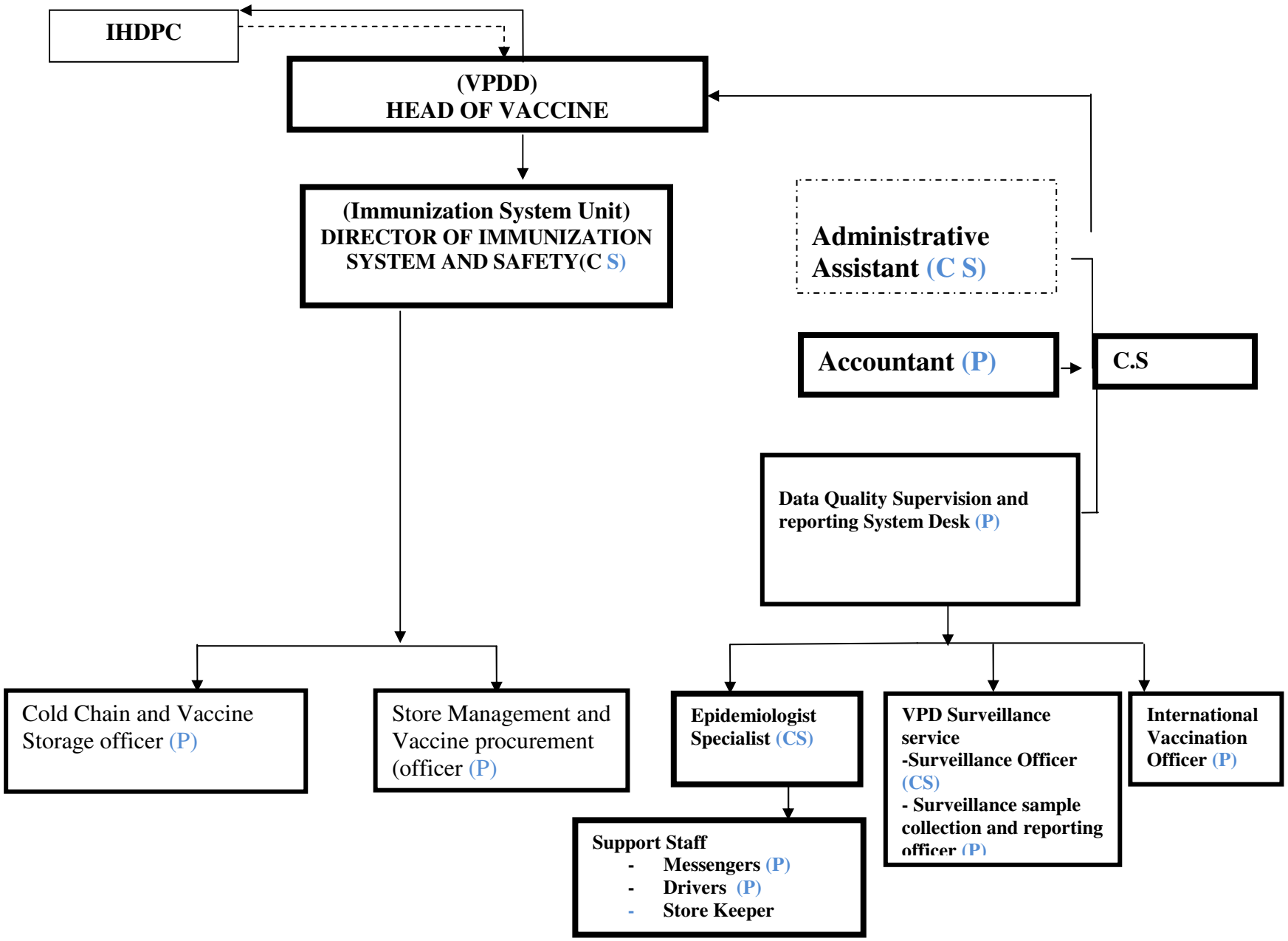
The program is planning to hire the following additional staff:, Logistics Assistant, a Dry store keeper and a second driver.

[1] Rotavirus vaccine is given in 3 doses, the first dose no later than 15 weeks of age and the last dose by 32 weeks of age

[2] Second dose of measles vaccine will be introduced in 2013: MR vaccine at 9 month and measles vaccine alone at 12 months of age

[3] Human papilloma virus vaccine (HPV) will use a school based vaccination campaign approach

ORGANIZATIONAL CHART FOR VACCINE PREVENTABLE DISEASES DIVISION



II. VPDD SITUATION ANALYSIS

The current VPDD situation analysis takes into consideration the following components: Service delivery, Surveillance of vaccine preventable diseases and of the AEFIs, Vaccine supply and quality, Cold chain & Logistics, Communication / social mobilization, Management, Capacity building and Finance.

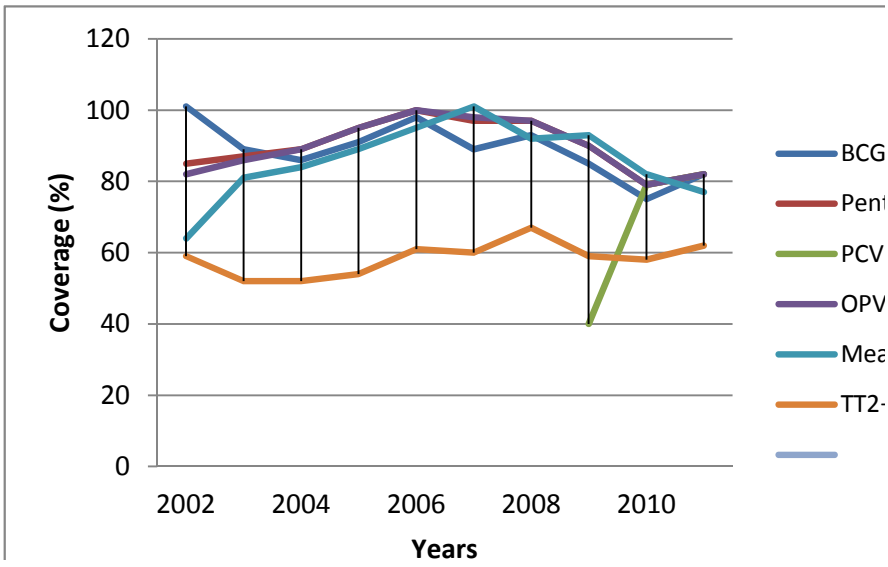
2.1. Service Delivery

Immunization activities remain part of the minimum package of interventions which are integrated within a health facility unit. In order to reach high proportion of target population, national EPI uses the following strategies: integration of immunization services at fixed health centres, combination of several approaches to reach the unreached in health catchment's areas especially in the hard to reach areas. However, more than 90% of Rwandan's children are immunized at the fixed immunization sites[4]. The outreach strategy has been revitalized in most of health facilities, using financial support made available by Government and GAVI Alliance. Since 2005, RED approach was introduced in all health districts. In 2007, ITN distribution and vitamin A supplementation were integrated with immunization services at heath centres. In 2005, PBF, which includes an overall of about 24 health indicators, among which the one targeting fully immunized children was, introduced at the health centre and community health worker levels.

The following tables and graphs show the trends of immunization indicators in the country.

2.1.1. Administrative vaccination coverage data

Graph 01: Routine immunization coverage data by antigen, Rwanda, 2002-2011



Source: Administrative data, national EPI Rwanda, 2012

[4]National Immunization Coverage Survey, conducted in 2007

According to the graph above, the immunization coverage for almost all antigens increased and was maintained at a higher level (except for TT2+) from 2002 to 2007. From 2008, however, coverage started to decline while the surveillance indicators (except for the measles) were at a good level (no wild poliovirus case was detected, incidence rate of MNT case remained lower than 1 per 1000 live births). Given this situation, in August 2010, a joint team from the Ministry of health and the WHO country office conducted a survey in 4 districts where the very low level of immunization coverage was reported. Findings from this survey showed the following results:

a) The proportion of under one year children was 2.6% (survey) instead of 4.1% as reported by health management information system (HMIS);
b) The number of recorded children < 1 year old was 31 588 (survey) compared to 53 336 estimates used by HMIS ;
c) Penta 3 coverage was 100% (survey) compared to 66% as reported by HMIS.

Findings from this survey showed that the denominator used to calculate administrative coverage data was over estimated (4.1% as estimated by projection from the 2002 census, around 9 years ago). The low proportion of children < 1 year of age (2.6% of the total population) is probably due to the improvement of Family Planning coverage (use of contraceptive methods which passed from 5% in 2002 to 51% in 2010). In 2011, immunization coverage started to rise again and shown on the graph n° 01.

For TT2+ coverage, the low coverage rate may be related to the recording system. The recording system in place doesn't allow the health workers to record appropriately TT doses as TT3 or TT4 or TT5.

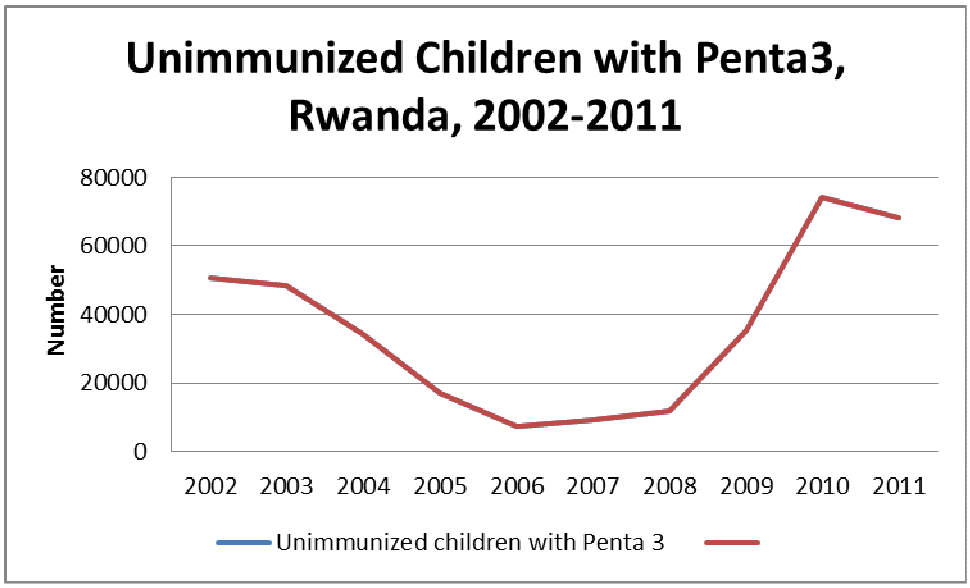
The PCV vaccine was introduced late in April 2009 by provincial phased approach; in addition, it took about 4 months, from April to August 2009, to cover the entire country with this vaccine. The proportion of the annual cohort infants (< 1 year of age) who received the first dose of PCV7 and the third dose of PCV7 in 2009 was respectively 54.4% and 40.2%. From 2010 to 2011, PCV coverage improved and reached the same level as the one of penta vaccine. Drop-out pneumo1-3, which started at 71% in June 2009, declined rapidly to reach the level of 3.1% in 2011. The same year, PCV coverage increased and reached the same level as for Penta 3 (82%).

Table 02: District performance, Rwanda, 2009-2011

District performances	Number of districts		
	2009	2010	2011
Penta 3 < 50%	0	0	0
Pneumo 3<50%		0	0
Penta 3 ≥50% <80%	5	26	14
Pneumo3 ≥50% <80%		26	14
Penta3 ≥80%	25	18	18
Pneumo3 ≥80%		18	18

In addition, Rwandan EPI started to report high number of children who failed to receive 3rd dose of Penta vaccine. The number of unimmunized children which declined from 2002 to 2006, started to increase again from 2007 to 2010.

As response to these findings, the staff from VPDD and partners intensified supportive supervision visits in the hard-to-reach areas, worked with health workers and members of the community to identify the hard-to-reach children and immunize them. As result to this intervention, in 2011, the number of unimmunized children started to decrease as shown on the following graph.



2.1.2. Drop-outs (D.O.)

Table 03: Penta1-Penta3 / Pneumo1-Pneumo3 drop-out rate trends, Rwanda, 2003-2011

D.O. rates	2003	2004	2005	2006	2007	2008	2009	2010	2011
Penta1-Penta3	1%	4,3%	1%	4%	1.4%	5,4%	0,2%	-0,9%	3,1%
Pneumo1-pneumo3								-0,9%	3,1%
% districts with D.O. < 10% for Penta	92.3%	89.7%	100%	100%	100%	100%	100	100%	97
% districts with D.O. < 10% for Pneumo								100%	97
% districts with D.O. > 10% for Penta	7.7%	10,3%	0%	0%	0%	0%	0%	0%	3%
% districts with D.O. > 10% for Pneumo								0%	3%

Source: EPI data base, 2012

From 2003-2010, all districts were performing well, related to this indicator. In 2011, however, for both vaccines, in 3% of districts, drop-out rate penta 1-3 and pneumo 1-3 were greater than 10%.

2.1.3. Supplemental immunization activities (SIAs)

In 2003, 2006, 2009, 2010 and 2011 measles SIA, integrated campaign (polio, measles, vitamin A, mebendazole and ITN distribution) and HPV vaccine were conducted and reached respectively high proportion of children as shown in the table 04 below.

Table 04: Integrated measles campaign, Rwanda, 2003, 2006 and 2011

Interventions	Coverage				
	2003	2006	2009	2010	2011
Measles campaign	97%				
Polio				**98%	***99%
Integrated campaign					
• Measles SIA		107%		101%	
• Vitamin A	101%	109%		106%	
• Deworming		108%		115%	
• ITN distribution		101%			
HPV					97%

*Mini Measles campaign in Rusizi district in July 2010

** Polio campaign integrated with MCH week in November 2010

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

High proportion of children was reached during the measles catch-up campaign in 2003 (97%). Again, for the measles follow-up campaign and other interventions – vitamin A supplementation and deworming conducted from 2006 to 2011, the coverage exceeded the 100% (probably due to the unknown denominator). In 2011, *a* 3 round-campaign of HPV vaccination were conducted and targeted adolescent girls aged 9 -14 years. For each round of the campaign, more than 95% of the targeted population was reached with HPV dose. Table below shows HPV coverage rate by round in 2011.

Table 05: HPV vaccination coverage by round, administrative data, Rwanda, 2011

	HPV 1st dose	HPV 2nd dose	HPV 3rd dose
Target population	94,141	94,141	94,141
No of immunized girls	91,752	89,704	88,927
Percentage (%)			

2.2. Surveillance

Immunization surveillance system, in Rwanda, is integrated with other disease surveillance which report cases and deaths to the Epidemic and infectious diseases division (EIDD) / RBC. Despite the fact that the vaccine preventable diseases are reported though the EIDD, measles, polio and neonatal tetanus are reported directly to VPDD in order to avoid delay the decision making process in case of outbreak. Monthly coordination meetings are held between VPDD and others services (national reference laboratory, EIDD and lab of the University teaching hospital of Kigali).

Global initiatives: **polio** eradication (documentation on polio certification), **MNT** elimination since 2004 and **measles** control) are key areas where surveillance data is being collected routinely.

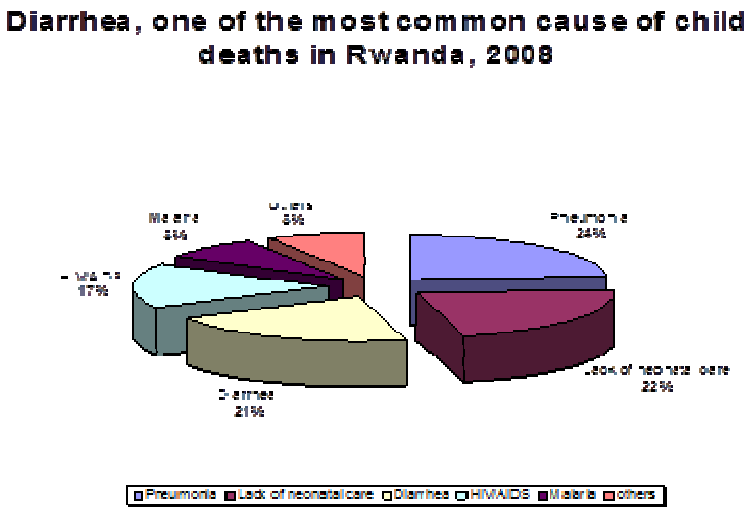
The following table shows the reported performance indicators for AFP, wild polio virus, suspected and confirmed measles cases, indicators for maternal neonatal tetanus (MNT), suspected and confirmed cases of severe gastroenteritis due to rotavirus and finally the paediatric bacterial meningitis.

Table 05: Surveillance indicators for Vaccine Preventable Diseases Division , Rwanda, 2005-2011

		Years						
Diseases	Indicators	2005	2006	2007	2008	2009	2010	2011
Polio	No polio AFP cases/100,000 people < 15yr	1.9	2.25	2.65	2.4	3.6	3.2	2.6
	WPV	0	0	0	0	0	0	0
Measles	% districts with suspected measles cases	50	93	90	80	93.3	100%	100%
	# lab confirmed cases reported	25	43	13	5	5	55	23
Rubella	Suspected cases	**NR**	**NR**	**147**	**186**	**254**	**517**	**318**
	Confirmed cases	**NR**	**NR**	**4**	**37**	**36**	**36**	**62**
	CRS	**NR**	**NR**	**NR**	**NR**	**NR**	**NR**	**NR**

Diseases	Indicators	Years						
		2005	2006	2007	2008	2009	2010	2011
MNT	# districts with suspected cases	4	2	1	1	0	0	1
	# cases/1000 live births	< 1	< 1	< 1	< 1	< 1	<1	<1
Diarrhoea[5]	Diarrhoea cases with stool samples						32	262
	Rotavirus +						10	133

Data from HMIS, in 2008, have shown that **diarrheal disease** is among the most leading causes of child deaths in Rwanda.



Since 2002, Rwanda initiated the paediatric bacterial meningitis surveillance system (PBMS) in one site (University teaching hospital of Kigali). The same year, the National Immunization Program introduced the Hib and HepB vaccines, combined to DTP vaccine (Pentavalent vaccine). In 2009, *S. pneumoniaë* surveillance was integrated to the PBMS. The following table gives figures from the sentinel site. Since pentavalent vaccination started in 2002 and pneumococcal conjugate vaccine was introduced in April 2009, the *Haemophilus influenzae*, type b and the *S. pneumoniae* figures after 2009 are post-introduction.

Table 06: Confirmed Meningitis cases by pathogen, CH Kigali, 2009- 2011

[5] Data from CHU of Kigali, March, 2012

	2002-Oct 2009		Nov-Dec 2009		2010		2011	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Hib	5	2					0	0
S. pneumoniae	29	14	0	0	0	0	0	0
N.meningitidis	17	4	0	0	0	0	0	0
Other pathogens	7	2	1	0	1	0	2	0
Negative	861	67	49	4	54	0	27	1
Total	902	89	50	4	55	5	29	1
% of positive cases	47%	20%	2%	0%	2%	0%	7%	0%

Source: Meningitis cases by pathogen, CH Kigali, 2002- 2011

Cervical cancer, the most common cancer among women in Rwanda, is an important national public health concern. The World Health Organization ranks Rwanda among the countries worldwide with the highest cervical cancer incidence*, estimated at 49.4/100,000.[6] This incidence estimate is consistent with cervical cancer incidence found in Eastern African overall (42.7/100,000 women/year).

Data from a population-based cancer registry in Butare which functioned during the early 1990s showed cervical cancer responsible for 22.5% of cancers among women[7] . In a retrospective study of cancer cases from two university teaching hospitals (Centre Hospitalier Universitaire de Kigali [CHUK] and Centre Hospitalier Universitaire de Butare [CHUB]) seen from 2000 through 2004, cervical cancer accounted for 27.3% of cancers among the women and was the most common malignancy encountered in all age groups.[8]

2.3. Vaccine supply, management and quality

Traditional vaccines are procured by the Government through UNICEF channel on basis of annual forecast estimates. Penta vaccine (introduced in 2002), PCV vaccine (introduced in 2009) and rotavirus vaccine are co-financed between Government and GAVI Alliance. For HPV vaccine, Rwanda signed a MOU with Merck, Co and received HPV vaccine donation for three years (2011-2013).

Vaccines are supplied to the national Program twice a year. Once every month, district hospitals using their own vehicles, come to the central level and collect vaccines upon their request and get the required amount. In case of emergency and during Supplemental immunization campaigns, central level distributes the needed amount of vaccines to the identified health districts using the VPDD's refrigerated truck. Health centres, using the same requisition system, collect vaccines from the district hospital cold stores using Health centre's motorbikes.

*age-standardized

[6] Castellsagué X, et al. HPV and Cervical Cancer in the World. 2007 Report. WHO/ICO Information Centre on HPV and Cervical Cancer (HPV Information Centre). [Accessed 24 March 2010]. Available at: www.who.int/hpvcentre

[7] Newton R, et al. Cancer in Rwanda. Int J Cancer. 1996 Mar 28;66(1):75-81.

[8] Ndahindwa V, et al. Cancer in 2 Teaching Hospitals of Rwanda (CHUK & CHUB). Presented at 11th Butare Medical Congress-BMC, Butare, Rwanda; 28–30 September 2006.

Vaccines are kept at the WHO required storage conditions in each level. Distribution, however, between each level in the supply chain, though effective, remains below target level[9].

At the national level, the NRA is not operational (exists but not well equipped) to monitor the vaccine security.

The table below summarized stocks of vaccines received, distributed and remaining stock at central level in 2011.

District hospitals and health centres record all vaccines and diluents separately at stock ledgers; central vaccine store, however, does not record any information about diluents.

Table 07: Vaccine supply and distribution, Central cold store, Rwanda, 2011

Vaccines	Stock on Jan 1st 2011	# doses received in 2011	Total stock in 2011	Distributed in 2011	Stock on Dec 31, 2011	% distributed in 2011	% in stock end 2011
BCG	375 300	600 000	975300	628 800	346 500	70	30
OPV	1 301 700	1 160 000	2461700	1 358 400	1 101 600	55	45
DPT-HepB-Hib	206 400	1 344 800	1551200	1 060 420	490 780	68	32
PCV	506 225	1 324 800	1831025	1002 200	828 825	55	45
Measles	274 360	443 900	718269	408 160	310 100	57	43
TT	156 700	530 000	686700	473 500	213 200	69	31
HPV	0	522420	522420	289720	232700	55	45

Source: National cold store, Rwanda, 2012

Looking at this table, except for BCG, Penta and TT vaccine which 70%, 68%, and 69% of available doses were distributed respectively during the year, the other vaccines, less than 60% of the available doses was distributed for each in 2011 (ranging from 55% to 57%) with the big amount of vaccine remaining at the central level. This situation might have a link with the fact that more than the needed vaccines were ordered; for this reason, vaccine forecasting approach might have played a negative role in vaccine management process (inappropriate vaccine wastage rates used, unknown target population used or inappropriate distribution approach used in the country). A functional computerized stock management system is needed for the central store with the definition of Min, Max and Alert stock level and their monitoring.

Cold chain equipment at central level (cold rooms) does not have automatic continuous temperature recorders. Temperatures are being monitored manually, twice a day and during the weekend and holidays. At district and health facility levels, temperatures are monitored by health workers, twice a day, unfortunately temperatures data are not

[9] EVM conducted in 2011

analyzed. Most often, icepack are not conditioned before distribution of liquid vaccines at the lower level.

2.4. Cold chain and Logistics

In 2011, Rwandan EPI, with technical support from partners, conducted Effective Vaccine Management survey (EVM) to assess vaccine management, cold chain situation and logistics issues. Findings from this assessment were used to develop an improvement plan which the program started to implement immediately as the Program was getting ready to introduce rotavirus vaccine.

EVM identified the following areas of improvement: (a) temperature monitoring, (b) cold and dry storage, (c capacity, (d) cold chain building, (e) stock management, (f) distribution and vaccine management. The following activities were carried out as part of improvement plan after the EVM.

- The multilog devices was procured awaiting to be installed
- Non function fridge tag replacement was initiated

- Additional shelves in the cold rooms is in the tendering process
- The UNICEF accepted to procure three cold units for cold rooms

- A functional computerized stock management system has been put in place, training on SMT done and put in use at central level.

- Vaccine package for transportation is now done according to WHO guidelines with proper ice pack conditioned during transportation

2.4.1. Cold and Dry stores

At central level, vaccines are kept in 4 positive walk-in cold rooms and one freezer room. Additionally there is one chest freezer to keep returning campaign OPV vials.

In October 2007, WHO Consultant and the MOH/EPI staff conducted a cold chain & logistics assessment (VMA and Rapid Assessment Tool were used) and identified the gaps for new vaccine introduction (PCV7). In order to accommodate the PCV7 vaccine, MOH and one of its partners (USAID) procured additional cold chain equipment for all levels. One additional walk-in-cold room of 15m3 was purchased and installed bringing the total up to 4 cold rooms – 3 positive and 1 negative – and hundreds of refrigerators, cold boxes, vaccine carriers and spare parts and distributed to district hospitals and health centres. Current net capacity of the cold rooms can be improved with additional shelves. All cold rooms and freezer rooms at central cold store should be fitted with dual refrigeration units.

Continuous temperature monitoring devices should be used at all levels. 30 day temperature monitors (Fridge-Tag) should be procured for all refrigerators used at district hospitals and health centres. The Multilog devices provided by UNICEF should be installed at the central cold store (CS) as soon as possible.

The Rwandan's VPDD doesn't have regional cold store for vaccines. All vaccines are directly collected from national cold store and stored at district hospital cold stores. Each district hospital received additional cold chain equipment to accommodate new vaccines.

VPDD, in addition to HPV vaccine, introduced rotavirus vaccine in May 2012 and plans to introduce measles-rubella vaccine (MR vaccine) as a second dose for measles vaccination in 2013. Before the introduction of HPV and rotavirus vaccines, districts and central level received new equipment to accommodate these new vaccines. Based on the findings from updated cold chain inventory, information was analysed using the WHO Logistics Forecasting Tool and estimated the additional equipment needed for MR vaccine accommodation. Based on these assessments, the following cold chain equipment needs were identified:

Table 08: Additional cold chain equipment needed and received, EPI Rwanda, 2013-2014

Level	Cold chain equipment	2013	2014	Total needed	Total received	Partners
Central	Cold room	1	0	1		
	Electric refrigerators	4	0	4		
	Icepacks	4000	0	4000		
Districts	TCW 3000	24	22	46		
	CB/INO/B3/90	40	40	80		
Health facilities	Sibir V170 EK	50	81	131		
	Vaccine carriers	250	250	500		

Table 8.1: Capacity and cost (for positive storage)

National vaccine store

		Formula	2013	2014	2015	2016	2017	2018
A	Annual positive volume requirement, including new vaccine (specify:_____) (litres)	*Sum-product of total vaccine doses multiplied by packed volume per dose*	114,096 ltr	117296 litr	125,576 litr	131383 litr	137601 litr	141,317 litr
B	Existing net positive cold chain capacity (liters)	*#*	55,100 litr	55,100 litr	55,100 litr	55,100 litr	55,100 litr	55,100 litr
C	Estimated minimum number of shipments per year required for the actual cold chain capacity	*A/B*	2.07	2.13	2.28	2.38	2.50	2.56
D	Number of consignments / shipments per year	*Based on national vaccine shipment plan*	4	4	4	4	4	4
E	Gap in liters	*((A/D) - B)*	**-26,576 litr**	**- 25,776 litr**	**- 23,706 litr**	**- 22,254 litr**	**- 20,700 litr**	**- 19,771 litr**
F	Estimated additional cost of cold chain	*US $*	$0	$0	$39,584	$46,389	$39,584	$39,584

Table 8.2: Capacity and cost (for negative storage)

National vaccine store

		Formula	2013	2014	2015	2016	2017	2018
A	Annual negative volume requirement, including new vaccine (specify:_____) (litres)	*Sum-product of total vaccine doses multiplied by packed volume per dose*	1,973 litr	2,025 litr	2,170 litr	2,273 litr	2,381 litr	2,443 litr
B	Existing net negative cold chain capacity (litres)	*#*	7,100 litr	7,100 litr	7,100 litr	7,100 litr	7,100 litr	7,100 litr
C	Estimated minimum number of shipments per year required for the actual cold chain capacity	*A/B*	0.28	0.29	0.31	0.32	0.34	0.34
D	Number of consignments / shipments per year	*Based on national vaccine shipment plan*	2	2	2	2	2	2
E	Gap in litres	*((A/D) - B)*	**- 6,114 litr**	**- 6,088 litr**	**- 6,015 litr**	**- 5,964 litr**	**- 5,910 litr**	**- 5,879 litr**
F	Estimated additional cost of cold chain	*US $*	$0	$0	$0	$0	$0	$0

2.4.2 Transport (national and district levels)

At the national level, refrigerator's truck is available for vaccine distribution in case of emergency and two 4WD vehicles for supportive supervision activities with two drivers. (A second driver just hired in 2012). The program needs one more vehicle and one additional drivers in order to cover effectively its needs.

In most of the cases, staff from district hospitals comes to collect vaccines and other medical supplies once every month. At this level, an ambulance and a 4WD vehicle are available for vaccine, drug distribution, and for supervision activities.

At the health facility level, motorcycles are available and bicycles for community health workers. Staff from health facility level goes to collect vaccines, other medical supplies and bring reports, once every month, at the district hospital level.

2.4.3. Maintenance

Contracts of maintenance were signed with private companies for all equipments of the division at the national level. At district level, some staffs were trained for preventive maintenance of cold chain equipments and spare parts are provided as needed.

2.5. Advocacy, Communication / Social Mobilization

There is a Communication Center for Health Sector in Rwanda (RHCC). The Center was created in 2002 and since then, provides technical support to all health programs / services. VPDD provide technical and relevant information to RHCC, Concerning the routine immunization program; however the efforts have to be amplified like the accent is made mostly for Supplementary Immunization Activities (SIAs).
The Center works with the following different organizations:

- Red Cross works with community, especially during the mass campaigns.
- URUNANA Development which works with BBC and European Union
- PROFEMME TWESE HAMWE which sensitizes population at the community level

There is no communication plan for immunization found at the national level (EPI). However, at the community level, about 13,000 community volunteers are working at the peripheral level with health workers, tracking defaulters and promoting immunization activities.

During the preparation of pneumococcal conjugate vaccine introduction, a communication subcommittee was put in place and addressed the main concerns of parents and of the health workers for the introduction of this vaccine. The subcommittee developed and pre tested key messages for parents before and immediately after immunization session.

2.6. New and Underutilized vaccine introduction

a) Rotavirus vaccine

Given the prevalence of diarrheal diseases in Rwanda, the availability of effective rotavirus vaccines and the WHO recommendation to all countries of all regions, to introduce this life-saving vaccine into the routine EPI programs, Government of Rwanda just introduced successfully rotavirus vaccine in its routine immunization program. On May 25, 2012, a 3-dose rotavirus vaccine (Rota Teq vaccine) was introduced. Focus for the country now is the intensification of supportive supervision to make sure that more eligible children are being vaccinated and the monitoring of AEFI related to the new vaccine is effective.

b) Measles second dose (MSD) and rubella containing vaccine (RCV) introduction

In 2011, EPI Rwanda reported administrative measles vaccination coverage of 77%, nationwide. Because of the theoretical measles vaccine efficacy of 85%, only 65% would be protected among the immunized children; about 35% of immunized children failed to seroconvert and remained at risk of being infected by measles virus. In addition to the non-protected vaccinated children, the unreached children with measles vaccine (about 23%) were also at risk of getting measles. The accumulation of this susceptible population for measles virus can explain the occurrence of measles outbreaks observed in some health districts.

VPDD Rwanda conducted measles vaccination campaign in districts where the outbreak occurred, targeting all children 0-59 months of age, and vaccinated most of children who already received first dose of measles vaccine (MCV1). Unfortunately, for some unknown reasons, some were not protected. In addition, EPI team reached some other who missed the first dose of measles vaccine. Based on the experience of measles campaign and of the WHO recommendation, EPI Rwanda decided to introduce a second dose of measles vaccine into its routine EPI system.

Based on global burden of rubella infection, of the congenital rubella syndrome (CRS) and of the proven efficacy and safety of RCVs, WHO recommends that countries take the available opportunity to accelerate measles control or elimination activities by introducing the rubella containing vaccine (RCVs). For this reason, EPI Rwanda plans to introduce a second dose of measles vaccine (MSD/RCV) in its routine immunization system.

c) Human papilloma virus vaccine (HPV)

In April 2011, VPDD Rwanda received a donation of HPV vaccine from a manufacturer (Merck, Co) for a three year-period (2011-2013). According to the MOU signed between Merck and GOR, Merck was supposed to provide the vaccine for a period of 3 years and Government of Rwanda to pay for injection material and all the operational costs. HPV vaccine received from Merck as a donation will end in 2013. Given the opportunity provided by GAVI for this vaccine, Rwanda would like to take the available opportunity, develop and submit a proposal to GAVI to continue the use of this vaccine in the routine beyond 2013.

As for the previous introduced vaccines (Pentavalent vaccine, pneumococcal vaccine, rotavirus vaccine and HPV), EPI team with support from partners have already updated the cold chain inventory and assessed for additional cold chain equipment needs to accommodate new vaccines, HPV vaccine and MR vaccine for an initial catch-up campaign and as a second dose (MSD/RCV) based on the WHO recommendation. MSD/RCV and HPV vaccine introduction plans were developed in order to identify the relevant and specific key activities for the introduction process.

Among the planned activities are the following:

(a) For MSD/RCV:

   a. Review epidemiology of rubella, including susceptibility profile of the population,
   b. Establish a system to collect and assess the burden of CRS in Rwanda,
   c. Advocate for a strong political commitment to the elimination of rubella and CRS and sustainable financing for vaccination and surveillance activities

(b) For HPV vaccine:

   a. Revise the current plan (developed in 2011) in order to continue with HPV immunization of adolescent girls beyond 2013

(c) For both of them, reinforce the coordination with EPI partners, address the remaining issues related to technical, financial and logistics.

(d) Organize and identify technical, logistics and social mobilization needs as the country is getting ready to introduce these new and under used vaccines (training of health workers, revision of all EPI data collection and management tools, development of key messages, dissemination of key information in community, etc.

2.7. Program management

2.7.1. Planning process

Planning process is conducted by each health program. Developed plans are sent to the MOH for consolidation. MOH integrates different plans received from health programs/services and come up with the national health plan. EPI is part of this plan which comes from the cMYP (where all the objectives and strategies were defined for every specific year of the life cycle of the cMYP).

2.7.2. Human resource management

VPDD staff comprises a small team which works with the districts to implement immunization activities. In most of the time, VPDD team relays on external support to carry out some key activities. National VPDD develops policy and strategies and helps districts to implement immunization activities.

2.7.3. Administration and Coordination

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 Permanent Secretary of health and meets on a quarterly basis.

2.7.4. Monitoring, Supervision and Evaluation

Several monitoring meetings are being held, at the district level, between staff from VPDD and those from districts, district hospitals and health centres. Districts also hold the same review meetings once every semester and reports to the community representatives. Once every quarter, national VPDD sends a feedback to all districts

Supervision visits are planned by the central level to districts quarterly. At the end of each supervision visit, a verbal feedback is provided to the visited district followed by a written feedback. District hospitals supervise the health facilities.

2.8. Capacity building

In 2005, two staff from national EPI and two professors from University were trained for MLM course, unfortunately no follow-up action was taken to continue with this training at the country level (adaptation of training modules at the country level, training of health workers at all levels and integration of immunization course in the cursus of medical student training program). In 2011, the MLM training modules were revised by WHO/AFRO and partners and tested. Two staff from the country attended this important training and will need to adapt the modules and train more staff within the country. About 80 staff from districts were trained for RED approach and 60 staff (2 by district) trained for data quality self-assessment (DQS). During the pneumococcal conjugate vaccine, HPV and rotavirus vaccine introduction process, training covering all technical areas of the EPI was organized (2009, 2011 and 2012) at all levels (training of trainers at central and district levels and training of health workers at the very operational level. In addition to these training sessions, supportive supervisions are being carried out at lower levels.

2.9. Financing

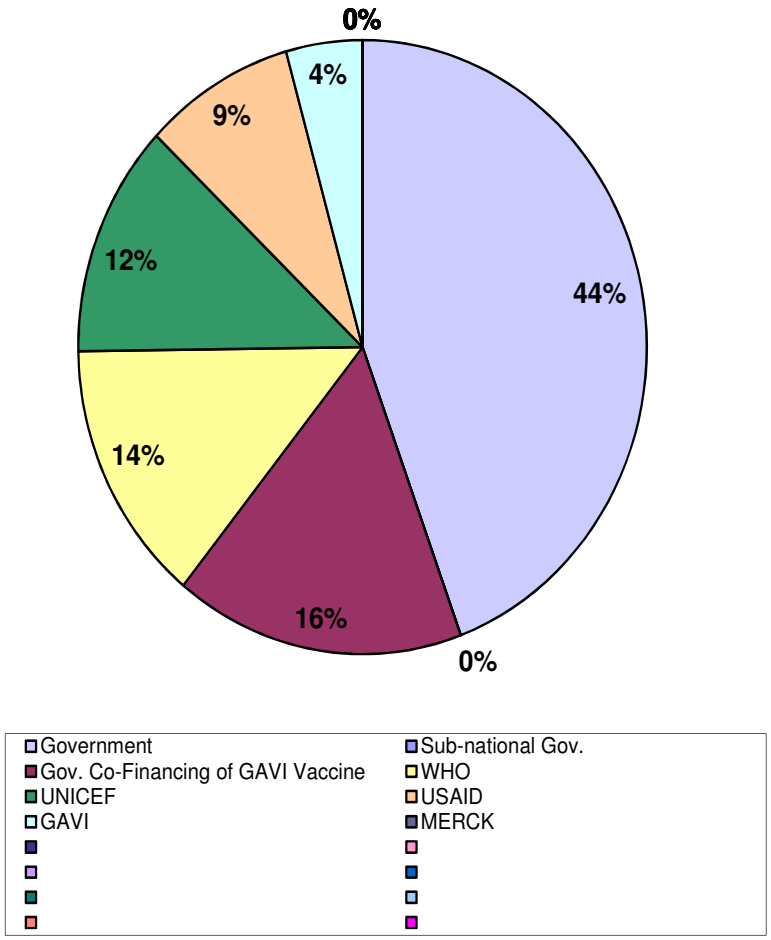
Rwandan national EPI is financed by the Government and its partners (GAVI, WHO, UNICEF, USAID). The Government already pays all the traditional vaccines and co-finances the new and under used vaccines.

The table bellow shows the baseline indicators related to immunization specific costs in 2011.

Baseline Indicators	2011
Total Immunization Expenditures	$4,098,345
Campaigns	$68,591
Routine Immunization only	$4,029,754
per capita	$0.4
per DTP3 child	$12.8
% Vaccines and supplies	37.1%
% Government funding	44.4%
% Total health expenditures	0.8%
% Gov. health expenditures	5.1%
% GDP	0.03%
Total Shared Costs	
% Shared health systems cost	
TOTAL	$4,098,345

The graph bellow shows the baseline financing profile of the program by partners and the Government role in 2011.

Baseline Financing Profile (Routine Only)*



2.10. Strengths and Weaknesses

Based on the above situation analysis, following strengths, weaknesses, opportunities and threats were identified:

STRENGTHS	WEAKNESSES
Service delivery	
1. Vaccination coverage which started to decline since 2008, started to increase in 2011. 2. High coverage achieved for most of antigens of the program and	1. Unknown denominator makes it very difficult to assess the key indicators of the program with accuracy. There is a need to conduct an EPI review to assess performance of the program

STRENGTHS	WEAKNESSES
maintained over the time (> 80%). 3. High coverage achieved during the SIAs in 2003, in 2006, in 2009, 2010 and in 2011 4. From 2007-2011, all districts were well performing with respect to drop-out indicator (Penta1-Penta3 <10%) 5. HPV vaccine introduced successfully in 2011 (donation from Merck), using both school-based and health center-based approach and reached the overall coverage of more than 95%	2. Reported TT2+ coverage for pregnant women is low; the reporting system in place doesn't allow to document TT3 or TT4, or TT5 3. Low measles coverage data in 2011 (<80%) at a level that can't prevent measles outbreaks. There is a need to introduce a second opportunity of this vaccine in routine 4. Number of unvaccinated children with Penta3 remained high in 2011
Vaccine supply management and quality	
1. No vaccine stock-out was reported 2. All the traditional vaccines are purchased by the Government through UNICEF channel 3. PCV and Penta vaccines are effectively co-financed by Government and GAVI Alliance 4. Vaccines are kept at WHO required storage conditions 5. Health districts (district hospitals) and health facilities collect vaccines actively from the higher level (pull system) 6. Availability of computerized vaccine and supply stock management tools (SMT Tool)	1. NRA not yet operational to assess vaccine security in the country 2. Vaccine over stock at the central level (Low rate of vaccine distribution at all level) 3. Vaccine forecasting system poses some problems at lower level
Cold chain and Logistics	
1. Correct application of MDV policy 2. Implementation of wastage monitoring principle 3. Use of VVM as a management tool 4. Correct distribution of vaccine and diluent based on the bundling principle 5. Temperature monitoring and follow up done	1. Insufficient cold storage capacity at all levels to accommodate new vaccines (HPV and MR vaccine for catch-up campaign and for second dose of measles vaccine in routine) 2. Continuous temperature monitoring devices are missing at all levels. 30 day temperature monitors (Fridge-Tag) should be procured for all refrigerators used at district hospitals and health centers. The Multilog devices provided by UNICEF should be installed at Central store as soon as possible. 3. Insufficient vaccine stock follow-up at district and health facility levels 4. Insufficient vaccine wastage reporting and follow-up

STRENGTHS	WEAKNESSES
Surveillance	
1. Polio eradication indicators satisfactory 2. MNT elimination goal achieved and sustained since 2004 3. 100% of health districts reported suspected measles cases in 2006, in 2010 and in 2011 4. 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) 5. Coordination meetings are held between VPDD and others services dealing with surveillance activities 6. Country initiated paediatric bacterial meningitis surveillance since 2002 and continues to function in two sites today 7. Rotavirus surveillance has been integrated into PBMS system 8. Rotavirus surveillance is now integrated in 5 sentinel sites	1. There is no system of zero reporting if no AEFI cases are seen during a reporting period 2. Weak syndromic surveillance system in place for pneumococcal related sicknesses with standard case definitions 3. Heavy burden of rotavirus diseases in the country 4. No system in place to collect CRS and establish burden of the disease
Communication	
1. Existence of national health Centre which assists health programs with communication/social mobilization activities 2. Existence of NGOs working with communities 3. About 13,000 community volunteers work at the peripheral level with health workers and promote immunization activities 4. Existence of communication subcommittee which developed key messages to address concerns of parents for new vaccine introduction 5. Communication focal person now hired and is available in VPDD	1. No Communication plan found for immunization activities at the VPDD 2.
Management	
1. Existence of a national planning process within the MOH 2. Existence of micro planning process at the health district level 3. Existence of operational ICC for immunization at the national level 4. Four new staff recruited within the EPI	Newly hired staff are not yet trained for program's activities

STRENGTHS	WEAKNESSES
program	
Capacity building	
1. Two VPDD staff and two professors from University trained for MLM course (2005). New VPDD staff and partners participated at a second MLM course using the revised modules 2. Training of health professionals, at all levels, was conducted prior to pneumococcal, HPV and rotavirus vaccine introduction was conducted 3. Training took into account major technical areas of immunization (vaccine management included) 4. Supportive supervision visits are being conducted at all levels of health system	1. No continuation of MLM course within the country (adaptation of training modules, integration of immunization course for the medical student training)
Finance	
1. VPDD is fully financed by the Government and partners (GAVI and ICC partners) 2. Government has a budget line available for vaccine procurement and other immunization supplies / services	

2.11. Opportunities and Threats

OPPORTUNITIES	THREATS
1. Government commitment and involvement in achieving MDGs (for MDG 4,5,6) 2. Presence of engaged traditional for VPDD (GAVI, WHO, UNICEF, USAID, etc.) 3. Donation of HPV vaccine from MERCK Company for three years 4. Opportunity offered by GAVI to support countries with more new and underused vaccines (HPV vaccine, MSD/RCVs)	1. Global economic crisis and waning support from donors 2. Frequent natural disasters across the world affect some donors 3. End of support from Merck related to HPV vaccine donation in 2013. If not approved by GAVI, this may compromise the likelihood for the country to continue the use of HPV vaccine as scheduled.

2.12. Identified Problems

1) Unknown target population and difficulty to calculate and measure the key core VPDD indicators with accuracy
2) High number of unimmunized children: Need to increase and maintain the vaccination coverage at a higher level and reach the unreached children
3) Absence of appropriate reporting system for TT vaccination doses for pregnant women which allows the documentation of TT3, TT4 and TT5 doses
4) Measles outbreaks reported in some districts
5) Diarrhoeal disease ranked the 3rd leading cause of death among under five children in Rwanda (2008): high incidence of gastroenteritis due to rotavirus (2011)
6) High incidence of cervical cancer due to human papilloma virus in Rwanda
7) Vaccine management problem: forecasting, stock management (at district and health facility levels) and distribution at all levels
8) Poor vaccine wastage reporting system and follow-up
9) Lack of continuous temperature monitoring devices at all levels to monitor the quality of vaccines
10) Cold chain material gaps reported at all levels to accommodate new vaccines in 2013
11) NRA not yet operational to assure the vaccine safety
12) Absence of communication plan at the national EPI level
13) No communication focal point at the VPDD

III. PRIORITIES

The priorities in the multi-year plan address the following main challenges

1) Pockets of the unreached children and the high number of unimmunized children
2) Heavy burden of severe diarrheal diseases with dehydration and pneumococcal diseases in the country
3) High incidence of cervical cancer among women in the country
4) Low measles vaccination coverage (<80%) combined with pockets of measles outbreaks reported in the country (2011)
5) Insufficient TT vaccination recording system for the pregnant women and coverage requirement compared to the GIVS objectives
6) Vaccine forecasting, stock management, quality and distribution
7) Inadequate cold storage capacity at all levels with respect to the needs for 2013
8) New hired VPDD staff not yet trained

IV. OBJECTIVES

The following key objectives and priorities are highlighted in the table below;

Priorities and points to improve	Objective	Milestones	Global goals	Order of priority
Severe diarrheal disease associated with rotavirus	By 2017, 100% of under 1 children will be vaccinated with 3 doses of rotavirus vaccine	2013: Reach eligible children with rota vaccine in May 2013 2013: 90% 2014: 90% 2015: 94% 2016: 96% 2017: 98%	By 2015, reduce the mortality and morbidity due to rotavirus infection among the under five year children	**1**
High incidence of cervical cancer among women	By 2013, HPV vaccine donated by Merck will end. From 2014, HPV vaccine will continue with GAVI support	By 2012: Develop and submit a proposal to GAVI for HPV vaccine introduction: 2013: 95% 2014: 95% 2015: 97% 2016: 97% 2017: 98%	By 2015 reduce the incidence of cervical cancer among women	1
Measles outbreaks reported in poor covered areas	By 2013, Introduce MR vaccine as a 2nd dose of measles vaccine in routine vaccination	2012: Develop and submit a proposal to GAVI for MR as 2nd dose of measles vaccine: 2013: 90% 2014: 90% 2015: 94% 2016: 96% 2017: 98%	By 2015, accelerate measles control / elimination activities to introduce RCVs	1
Pockets of the unreached children and existence of the high number of unimmunized children	By 2013, increase access to immunization services with all antigens used in program	By 2013, - Use data from Demographic census (2012) and identify true denominator - Intensify RED approach and reach at least 90% coverage for all antigens	By 2015, Reach the unreached population with immunization services and address the equity issue	**1**
Poor TT dose recording system & coverage TT2+ remains low compared to GIVS objectives	By 2015, improve the TT dose recording system & report 80% of pregnant women with at least TT2+ coverage	By 2013, put in place a system that help to record all TT doses received and report high TT2+ coverage 2013: 70% 2014: 75% 2015: 80% 2016: 80% 2017: 85%	By 2017, maintain the status of NNT elimination.	2
Poor vaccine management (forecasting, stock management, quality and distribution) especially at	By 2015, a well performing vaccine management system will be in place within 100% of health	By 2013, all districts will be able to estimate vaccine needs, control the vaccine quality, monitor vaccine waste, and stock management, 2013: 80%	By 2015, improve and maintain good vaccine management in order to minimize the waste (improve vaccine forecasting, quality control, better stock	2

Priorities and points to improve	Objective	Milestones	Global goals	Order of priority
intermediate and health facility levels	districts	2014: 90% 2015: 100% 2016: 100% 2017: 100%	management system and distribution)	
NRA non-operational to ensure vaccine security	By 2014, NRA is operational and used to ensure the vaccine security	2013: Meeting with the appropriate directorate and discuss the operational issues for NRA and make recommendations	Ensure the vaccine security	3
Insufficient human resources within the EPI program (qualitatively and quantitatively)	By 2015, reinforce the capacity of the EPI staff (quantitatively and qualitatively)	2013: proposed posts for EPI is fulfilled and trained		4

4.1. Objective 1: Vaccination coverage and vaccine wastage rates

	Coverage Objectives					Wastage Objectives				
Type of Vaccine	**2013**	**2014**	**2015**	**2016**	**2017**	**2013**	**2014**	**2015**	**2016**	**2017**
Routine Immunization	**(%)**	**(%)**	**(%)**	**(%)**	**(%)**	**(%)**	**(%)**	**(%)**	**(%)**	**(%)**
Traditional Vaccines										
BCG	95%	95%	97%	98%	98%	40%	40%	40%	40%	40%
TT – Pregnant women	70%	75%	80%	80%	85%	15%	15%	15%	15%	15%
MR 1st dose of measles	90%	90%	94%	96%	98%	25%	25%	25%	25%	25%
Measles 2nd dose	90%	90%	94%	96%	98%	25%	25%	25%	25%	25%
OPV(3)	90%	90%	94%	96%	98%	15%	15%	15%	15%	15%
Underused and New Vaccines										
DTP-Hep B-Hib(1)	90%	90%	94%	96%	98%	5%	5%	5%	5%	5%
DTP-Hep B-Hib(3)	90%	90%	94%	96%	98%	5%	5%	5%	5%	5%
PCV-13 (3)	90%	90%	94%	96%	98%	5%	5%	5%	5%	5%
Rota vaccine (3)		80%	96%	98%	98%	5%	5%	5%	5%	5%
Campaigns	**(%)**	**(%)**	**(%)**	**(%)**	**(%)**	**(%)**	**(%)**	**(%)**	**(%)**	**(%)**
MR catch-up campaign (9 months to 14 years of age)	95%									
HPV	95%	95%	97%	97%	98%	5%	5%	5%	5%	5%

4.2. Other objectives:

By 2013, reach and maintain the polio eradication initiative goal
By 2015, maintain the MNT elimination goal

By 2015, reach and maintain the measles elimination level

V. STRATEGIES AND PRIORITY ACTIVITIES

The program shall focus on strategies and activities relating to the following operational components of immunization program:

1. Vaccination service delivery
2. Advocacy / Communication / Social Mobilization
3. Surveillance for vaccine preventable diseases (VPD)
4. Vaccine supply, cold chain, and logistics (CCL) management
5. Program management and capacity building

Strategies and activities to be implemented for each of these technical areas are highlighted in the table below.

5.1. Vaccination service delivery

Objectives	**Strategies**	**Priority activities**
By 2015, immunize under 1 children and reach the following coverage: BCG 97% Penta3: 94% PCV-3: 94% OPV3: 94% Rota-3: 94% Measles 1: 94% Measles 2: 94%	Implement / reinforce Reaching Every District (RED) approach in all districts	- Implement the five RED components in all districts - Organize workshops on micro planning in all districts (by health catchment area) - Strengthen the outreach services in hard-to-reach areas
Immunize adolescent girls with HPV vaccine and reach the coverage of: 97%	Target school-based and health-based approaches to maximize the chance to reach majority of adolescent girls	- Conduct HPV vaccination campaign and administer 3 doses of HPV vaccine using both school based and health center-based approaches and reach more girls aged 9-14 years with HPV vaccine - Give special attention to the out-of school girls by targeting the health center-based approach with support from community health workers -
By 2015, reach and maintain the measles / rubella elimination level and the polio eradication status	Reinforce the measles case-based surveillance in all districts with involvement of the community	- Strengthen outreach services where needed - Provide all health centres with motorbikes - Provide incentives to health workers and community health workers

	Establish rubella and CRS prevention as a public health priority	- Conduct a study to assess burden of congenital rubella syndrome (CRS)
	Introduce MR vaccine as a second opportunity for measles vaccination and also an opportunity for rubella elimination	- Conduct a catch-up campaign for children aged 9 months to 14 years with MR vaccine and reach a coverage of more than 95% - Immediately after campaign, introduce MR vaccine in the routine, in addition to measles vaccine
	Polio eradication activities	- Maintain high level of AFP surveillance indicators - Identify high risk areas and be ready for reactive campaign in case of WPV importation - Maintain high OPV3 coverage (above 90%)

5.2. Advocacy, communication, and social mobilization

Objectives	**Strategies**	**Priority activities**
By 2015, immunize under 1 children and reach the following target coverage: BCG 97% Penta3: 94% PCV-3: 94% OPV3: 94% Rota-3: 94% Measles 1: 94% Measles 2: 94%Immunize pregnant women and reach the following coverage: TT2+: 80%	Strengthen ICC partners' collaboration around immunization program	- Advocate and engage additional partners to support VPD Division - Hold the strategically ICC meetings quarterly - Hold, on monthly basis, technical ICC meetings with ICC technical partners
	Reinforce communication/social mobilization working sub committee	- Conduct focus groups and develop key messages for rotavirus vaccine introduction - Pre test the developed key messages for new vaccine (rotavirus vaccine) - Develop BCC materials for routine immunization
	Development of integrated plan of communication	- Conduct a planning workshop with other programs and develop an integrated plan of communication - Implement , monitor and evaluate the developed plan
By 2012, NRA is operational and used to ensure the vaccine security	Advocacy with respect to decision makers	- Plan and hold advocacy meeting with Pharmacy directorate of MOH for NRA reinforcement
By 2013, reinforce the capacity of the EPI team (quantitatively and qualitatively)	Advocacy with respect to ICC partners in order to orient and train the recruited staff	- Plan, orient and train the newly recruited staff at national EPI level
	Training and BCC reference materials dissemination	- Develop BCC materials for new vaccines. - Explore conducting training for joint interventions - Train 2 EPI personnel in surveillance - Train 2 central level EPI personnel in VPD Division management - Arrange for the participation of two EPI health personnel in international meetings on immunization - Train district and health centre level in vaccine management

5.3. Surveillance for VPD Division target diseases

Objectives	Strategies	Priority Activities
By 2015, maintain polio eradication goal and integrated surveillance	Integrated disease surveillance and response	- Strengthen active surveillance in AFP, in all districts - Convene monthly meetings with focal points for AFP surveillance - Establish a database on integrated surveillance of diseases
		- Integrate rotavirus surveillance within the PBMS sentinel sites
	Reinforce links with laboratories for different conditions (polio, measles, diarrhoea and meningitis)	- Strengthen collaboration between the laboratories for polio and measles - Provide sufficient reagents to referral lab - Reinforce the capacity of lab workers
	Use of standard case definition for pneumococcal and severe diarrheal disease surveillance	- Train health workers for case definition of pneumococcal disease and severe diarrheal disease to be reported - Update the reporting tools which include pneumococcal and diarrheal diseases and train them on how to complete the tools
Reach and maintain the measles / rubella elimination level	Active case-based surveillance for measles by the way of integrated surveillance for vaccine-preventable diseases	- Strengthen active surveillance for measles in all districts - Conduct monthly meetings for surveillance focal points - Develop district level emergency preparedness and prevention plans - Strengthen analysis and use of data at all levels - -
	Capacity-building for AEFI	- Train new district focal points on AEFI - Conduct regular monitoring of AEFI - Report zero case of AEFI if there is no case of AEFI during the reporting period
Maintain the maternal neonatal tetanus (MNT) elimination level during the timeframe of this plan and thereafter	- Active surveillance for MNT by the way of integrated surveillance for vaccine-preventable diseases	- Strengthen active surveillance of AFP, measles, and MNT in all districts - Implement the plan for maintaining the elimination of MNT

5. 4. Vaccine supply, cold chain, and logistics management

Objectives	Strategies	Priority Activities
By 2015, immunize under 1 children and reach the following coverage: BCG 97% Penta3: 94% PCV-3: 94% OPV3: 94% Rota-3: 94% Measles 1: 94%	Regular high quality vaccine supply at all levels	- Order and supply vaccines to all districts - Procure more cold chain equipment to accommodate new vaccines (HPV, MR vaccine) at identified district hospitals and health facilities - Provide HFs with growth monitoring cards
	Regular auto-disable (AD) and reconstitution syringes supply to all districts	- Implement the policy of providing AD syringes for all injectable vaccines in all districts using the bundling principle

Measles 2: 94% Immunize pregnant women & adolescent girls and reach the following coverage: TT2+: 80% HPV: 97%		- Build one incinerator per health facility without incinerator « per district »,
	Best practices of AD syringes in all districts	- Supportive supervision in vaccinating health facilities
	Improvement of means of transportation at the central level	- Provide one additional 4x4 vehicle to national EPI
By 2015, a well performing vaccine management system will be in place within 100% of districts	Vaccine management improvement	- Train health workers in vaccine forecasting, vaccine stock management and vaccine wastage monitoring - Provide appropriate management tools at district and health facility levels - Supervise teams at district and health facility levels - Monitor vaccine wastage

5.5. Program Management and capacity building

Objectives	**Strategies**	**Priority Activities**
By 2015, immunize under 1 children and reach the following coverage: BCG 97% Penta3: 94% PCV-3: 94% OPV3: 94% Rota-3: 94% Measles 1: 94% Measles 2: 94% Immunize pregnant women & adolescent girls and reach the following coverage: TT2+: 80% HPV: 97%	EPI management improvement at all levels	- Hold technical ICC meeting on a monthly basis - Develop on job-training plan and implement it for all the district health workers - Supervise districts and health facilities - Train health workers in EPI management - Improve the management of data through continuing education, monitoring, and feedback to all levels
	Analyze to improve efficiency, effectiveness, access, and use of services	- Conduct operational researches (OR) on integrating other health interventions with immunization - Conduct operational research (OR) to determine effective and efficient ways to reach the hard-to-reach populations - Conduct OR on new technologies
	Maintaining existing links and exploring integration with other health interventions	- Include vitamin A in 2015 measles campaign - Integrate vitamin A supplementation into routine vaccination - Support implementation of IMCI through routine vaccination - Monitor performance with integrated interventions - Collaborate with Integrated Disease Surveillance and Response and with emergency humanitarian activities to assure that required vaccines are available during emergencies
By 2013, reinforce the capacity of the EPI staff (quantitatively and	Current staffing review and adjustment in EPI Program	- Conduct meeting to review and advocate for additional staffing as needed - Train all VPDD staff using the national MLM

Objectives	Strategies	Priority Activities
qualitatively		course (mostly the newly recruited)

VI. TIMELINE ACTIVITIES

Components	Strategies	Priority Activities	2013	2014	2015	2016	2017
Vaccination service delivery	Implement / reinforce / sustain Reaching Every District (RED) approach in all districts	- Implement the five components of RED in all districts	X	X	X	X	X
		- Organize workshops on micro planning with districts	X	X	X	X	X
	Monitor correct administration of rotavirus vaccine and immunize all eligible infants	- Assist the health workers to plan and immunize the eligible children both at fixed and outreach sessions	X				
		- Intensify the supervision visits at operational level	X	X	X	X	X
		- Conduct rota vaccine post introduction evaluation	X				
	HPV vaccine introduction	- Conduct micro planning for HPV campaign using school based campaign		X	X	X	X
		- Identify out-of school girls and plan to immunize them using the health center-based approach		X	X	X	X
		- Document vaccination and report		X	X	X	X
	Measles / rubella elimination activities	- Conduct a catch-up MR campaign 2013	X				
		- Introduce MR vaccine as a second dose of measles vaccine in routine vaccination	X	X	X	X	X
	Strengthening of the ICC	- Advocate and engage additional potential partners in ICC	X				
		- Hold, on a monthly basis, technical ICC meetings	X	X	X	X	X
		- Hold strategic ICC meetings on quarterly basis	X	X	X	X	X
	Development of integrated communication plan	- Develop, with other programs, an integrated plan of communication	X	X	X	X	X
		- Implement communication activities within the VPDD	X	X	X	X	X
		- Implement the developed plan	X	X	X	X	X

Components	Strategies	Priority Activities	2013	2014	2015	2016	2017
Advocacy, Communication / Social mobilization	Implementation of communication plan for routine, supplementation and surveillance activities.	- Develop the communication plan for measles - Organize meeting with NGOs and associations, including community health workers, to discuss their participation in immunization activities .	X X	X X	X X	X X	X X
	Advocacy with respect to decision makers	- Plan and hold meeting with Pharmacy directorate of MOH for NRA reinforcement	X	X			
Surveillance of the VPDD targeted diseases	Integrated disease surveillance and response	- Strengthen active surveillance for AFP, in all districts - Establish a database on integrated disease surveillance - Convene monthly meetings with focal points for AFP surveillance	X X	X X	X X	X X	X X
	Reinforce links between laboratories for different conditions (polio and measles)	- Strengthen collaboration between the laboratories for polio and measles - Provide sufficient reagents - Reinforce the capacity of lab workers	X X X	X X	X X	X X	X X
	Case definition for pneumococcal and severe rotavirus diseases	- Train health workers for case definition of pneumococcal diseases and severe diarrheal to be reported - Update the reporting tools which include rotavirus diseases and train them on how to complete the tools	X X	X			
	Active case-based surveillance for measles / rubella by the way of integrated surveillance for vaccine-preventable diseases	- Strengthen active surveillance for measles and rubella in all districts - Conduct monthly meetings for surveillance focal points - Develop district level emergency preparedness and prevention plans - Strengthen analysis and use of data at all levels - Train health facility managers in surveillance for AFP, measles, rubella NNT, pneumococcal and rotavirus disease	X X X X X	X X	X X	X X	X X
	Capacity-building for AEFI	- Train new district VPDD focal points in AEFI - Conduct regular monitoring and reporting of AEFI	X X	X X	X X	X X	X X

Components	Strategies	Priority Activities	2013	2014	2015	2016	2017
Vaccine supply, cold chain, logistics management	Regular high quality vaccine supply at all levels	- Forecast, order and supply vaccines to all districts	X	X	X	X	X
		- Assess cold chains & logistics and procure additional cold chain equipment for rotavirus vaccine introduction	X				
		- Provide health centres with revised growth monitoring cards	X	X	X	X	X
	Regular auto-disable (AD) syringes supply to all districts and health centres	- Implement the policy of providing AD syringes for all vaccines in all districts	X	X	X	X	X
		- Build one incinerator per health facility « per district »,	X	X	X	X	X
	Vaccine management improvement	- Train health workers on vaccine forecast, stock management and vaccine wastage monitoring	X	X	X	X	X
		- Provide appropriate revised management tools at district level	X	X	X	X	X
		- Supervise teams at district and health facility levels	X	X	X	X	X
		- Monitor vaccine wastage	X	X	X	X	X
Program management and Capacity building	EPI management improvement at all levels	- Hold technical ICC meeting on a monthly basis	X	X	X	X	X
		- Develop on job-training plan and implement it for all the district health workers	X	X	X	X	X
		- Supervise districts and health facilities	X	X	X	X	X
		- Train health workers in EPI management	X		X	X	
		- Improve the management of data through continuing education, monitoring, and feedback at all levels	X	X	X	X	X
	Analyses to improve efficiency, effectiveness, access, and use of services	- Conduct operational researches (OR) on integrating other health interventions with immunization	X	X			
		- Conduct OR to determine effective and efficient ways to reach the hard-to-reach populations		X			
		- Conduct OR on new technologies		X	X		
	Maintain existing links and explore integration with other health interventions	- Include vitamin A in 2012 measles campaign		X		X	
		- Integrate vitamin A supplementation into routine vaccination		X	X	X	X
		- Support implementation of IMCI through routine vaccination	X	X	X	X	X

Components	Strategies	Priority Activities	2013	2014	2015	2016	2017
		- Monitor performance with integrated interventions - Collaborate with Integrated Disease Surveillance and Response and with emergency humanitarian activities to assure that required vaccines are available during emergencies		X X	X	X	X

VII. IMPLEMENTATION, MONITORING AND EVALUATION MECHANISMS

7.1. Implementation

The cMYP, once developed and approved by all ICC members, will need to be printed and largely disseminated to all partners and to the implementers at district level. The cMYP will serve both as a management and advocacy tool for the Ministry of Health / VPDD and help partners to better understand their involvement while making decision to support the immunization program.

Develop an operational plan for the first year of implementation. This will be done every year, with much attention focused on the year's objectives and strategies as developed in cMYP. Detailed activities and key indicators will be defined.

Support to health districts for micro planning sessions with particular attention to a very detailed situation analysis and to the objective definition. Planned activities will need to be concrete and those which address the planned objectives.

7. 2. Monitoring and Evaluation

Country will be required to develop a monitoring and evaluation plan. The plan will define and list key indicators to be followed on a regular basis. Periodic follow-up meetings will be organized at all levels. Annual and mid-annual reviews will also be planned and carried-out in order to assess progress made toward the planned objectives, identify the weaknesses and update the plan as needed. A feedback will always be provided to VPDD focal points at all levels.

The following table shows some key indicators that will be followed by Program:

Strategy	Key indicators
Polio	OPV3 coverage
	Non-polio AFP rated >2 per 100,000< 15 years
MR / Measles	Routine first dose measles coverage

Strategy	Key indicators
	Routine second dose measles coverage
	% of districts that report at least one suspected case
MNT	TT2+ coverage
	Number of districts reporting at least 1 case per 1000 live births
Vaccination coverage and drop-outs	BCG coverage
	DTP-HepB+Hib1
	DTP-HepB+Hib3
	PCV1
	PCC3
	Rota-1
	Rota-3
	HPV1
	HPV2
	HPV3
	MCV1
	MCV2
	% of districts >80% DTP-HepB-Hib3 coverage
	DTP1-measles drop-out rate
	Penta1-Penta3 drop-out rate
	% of districts with Penta1-Penta3 drop-out rate >10%
	% of districts with Penta1-Penta3 drop-out rate <10
	% of districts with DTP1-measles drop-out rate >10%
	% of districts with DTP1-measles drop-out rate < 10
VPD surveillance	% Completeness of reports
	% Timeliness of reports
Cold chain and logistics	% of districts with functioning cold chain equipment
Injection safety	% of districts with sufficient supply of AD syringes
	% districts using AD syringes
Supply of vaccines and injection supplies	Stock-outs of vaccines
	Stock-outs of syringes
	Stock-outs of diluents
Communication/social mobilization	Existence of annual plan
Integration with other health interventions	Integrated interventions
Human resources	Number of vaccinators per 100,000 population
Sharps waste management	% of health facilities with functioning incinerator per districts?
	% of health facilities with safety boxes
Interagency Coordinating Committee	Number of meetings held per year
Financial sustainability	Proportion of coming 5-year's total program costs secured (trend indicator)
	Proportion of EPI routine costs funded through Govt own resources
	Proportion of Govt funding to routine program costs, (minus pentavalent vaccine)

VIII. BUDGET, FINANCING AND FINANCING GAPS FOR cMYP

8.1. Methodology and inputs into program costing

This section presents the budget, financing and financing gap analysis for the program, based on the expected activities to be carried out. The methodology is based on deriving costs of different program inputs (such as vehicles needed, or vaccines), and activities to be carried out (such as trainings, etc). Information is collected in a pre-designed costing, financing and gap analysis tool for cMYP, supplied by WHO.

The following is a brief summary of the information incorporated.

8.1.1. Health sector analysis

The country Gross Domestic Products (GDP), which was estimated to US$ 259 per capita in 2006, increased during the last 4 years and reached US$ 536 per capita in 2009. In 2011, it increased and reached US$ 1,137 per capita. The total health expenditure is estimated at US$ 48 per capita, with the Government expenditure at 47% of this. The 1US= 600 FRW as of in October 2011.

Regarding key demographic indicators, the most recent census, conducted in 2002 has estimated the population to 8,128,553 inhabitants. Using the population grow rate of 2.6%, the estimated population for 2010 was estimated to 9,981,415 inhabitants. In 2011, this population was estimated to 10,240,932 inhabitants. The births represented 4.1% of the total population and surviving infant 3.8%. Women of child bearing age represent 23.6% of the total population. The infant mortality which was estimated at 107/1000 up to 2005, down to 86/1000 in 2006 is now estimated to 50/1000 live births (2010).

8.1.2. Vaccines and injection supplies costs

The country uses surviving infants for forecasting for all antigens, apart from BCG and TT. The estimated number of surviving infants in 2011 is 398,884. Antigens used in the country, with the coverage and wastage targets for the period of the multi-year plan, are already highlighted in section IV. Key cost related highlights include:

- Costs for respective doses of antigens, and supplies are based on current contracts between manufacturers and UNICEF. Prices are updated as per 19 Apr 2010. AD syringes validity is 31/8/2011; Safety boxes price validity is 30/9/2011.
- The country is carrying out preventive polio campaign in 2011 and in 2014 and a follow-up measles campaign in 2012 and in 2015.

8.1.3. VPDD personnel

The personnel for VPDD at the national level are: 1 VPDD Head of Division, 1 Epidemiology specialist, 1 Monitoring/Evaluation officer, 2 Surveillance officers, 1 Logistician, 1 Cold chain officer, 1 International vaccination officer, 1 Accountant,

Administrative Assistant, 1 Driver, 2 messengers and 1 cleaner. These all spend 100% of their time on VPDD and some spend on average 2 days per month on supervision, apart from the International vaccination officer, messengers and cleaner.

Program will add 3 more staffs this year in order to effectively fit the needs of the program (Logistics Assistant, Dry store keeper and a second Driver). Attempt will be made through strategic ICC team and see if the additional staff can be added in 2013.

At the district level, the District and Hospital health officers are estimated to spend 20% of their time on VPD, while the selected VPD focal point spends 40% of time on EPI.

At the health facilities, the health officer spends an estimated 20% of their time on VPDD, while the selected VPDD focal point spends 40% of their time. The community volunteers also spend 20% of their time on VPDD related activities. These volunteers don't get salaries, as with all the other staff associated with EPI, but get allowances when they provide outreach activities.

8.1.4. Vehicles and transport costs

Fuel price is US$ 1.7, with the maintenance expenses estimated at 15% of the fuel expenses. Vehicles useful life is estimated at 5 years. The program uses 4WD vehicles, and motorcycles. The 4WD vehicles are used at the central level (100% for VPDD) and district level (20% for VPDD). Motorcycles are used at district (20% for VPDD) and health facility (20% for VPDD) levels. Cold room truck available at the central level for vaccine distribution in case of emergency

There are 2-4WD vehicles at the central level for VPDD and a third is planned for 2012. On the other hand, each district has on average 1 vehicle and 1 motorcycle.

8.1.5. Cold chain equipment

Cold chain storage capacity was increased in 2008 with the introduction of pneumococcal vaccine. Additional walk-in-cold room, hundreds of refrigerators, cold boxes, vaccine carriers and spare parts were procured and distributed to all levels (central, district hospitals and health centers). However, in order to accommodate HPV and rotavirus vaccines, more cold chain equipment were procured and distributed. With respect to MR vaccine introduction (wide campaign and its introduction in the routine), more cold chain equipment are needed at central level, at some district hospitals and to some extend at some health facility levels.

8.1.6. Campaign operational costs

Measles and rubella (MR) catch-up campaign are to be carried out in 2013. Measles-rubella campaign will target all children aged 9 moths to adolescent up to t14 years of age, probably integrated campaign with other public health interventions such as (ITN distribution, mebendazol, and Vitamin A supplementation).

8.1.7. Costs of activities

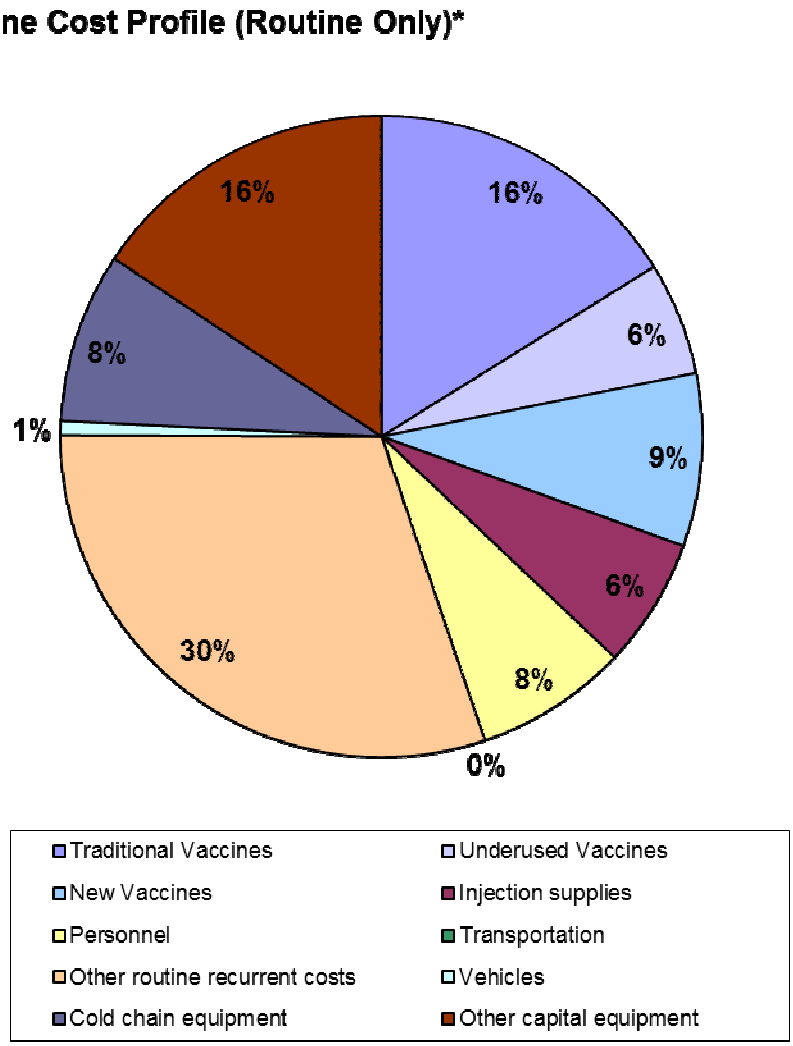
The table below illustrates the estimated costs of the different program activities to be carried out in the period of the multi year plan.

8.2. Cost Analysis and Financing

Under this section, we are going to analyze costs and financing as follows:

- Cost and financing for the baseline year (2011)
- Cost and financing for the life cycle of cMYP
- Gaps analysis
- Strategies for Finance sustainability

8.2.1. Cost and financing for the baseline year (2011)



OD PLAN FOR 2013

							Available funding per partner					Gap
ies	**Priority Activities**	**Qtr 1**	**Qtr 2**	**Qtr 3**	**Qtr 4**	**Cost estimates**	**Gov**	**USAID**	**GAVI**	**WHO**	**UNICEF**	
ent / reinforce Reaching District (RED) h in all	- Organize micro planning workshops for health districts	X				20,000	10,000			10,000		0.0
		X	X	X	X	35,000	15,000			25,000		
	- Supervise	X	X	X	X	250.000			250.000			
	- Reinforce outreach	X	X	X	X							
	- Strengthen monitoring and use of data for action	X	X	X	X	14,500	9,000			5,500		
	- Reinforce link with the community	X	X	X	X	120,000						120,000
	- Provide incentives to health workers and community health workers (volunteers)											

								Available funding per partner					Gap
Components	**Strategies**	**Priority Activities**	**Qtr 1**	**Qtr 2**	**Qtr 3**	**Qtr 4**	**Cost estimates**	**Gov**	**USAID**	**GAVI**	**WHO**	**UNICEF**	
	Preparedness and implementation of MR vaccine catch-up campaign	- Operational costs for MR campaign: planning, training of health workers, per diem, distribution of vaccine, management tools, supervision, cold chain, monitoring and evaluation)	X	X			5,000 674,520	5,000 357,778		 116,742	 200,000		
	Preparedness for introduction of MR vaccine in routine system	- Advocacy for MR introduction support (GoR, Partners and community) - Assessment of CRS - Technical, logistics and communication preparation) - Introduction of MR vaccine -	X X X	X X X	 X X								
	HPV vaccine campaign from MERCK stock	- Conduct 3 round campaign - AD syringes and safety boxes - Per diem	X X X	X X X		X X X							

								Available funding per partner					Gap
Components	**Strategies**	**Priority Activities**	**Qtr 1**	**Qtr 2**	**Qtr 3**	**Qtr 4**	**Cost estimates**	**Gov**	**USAID**	**GAVI**	**WHO**	**UNICEF**	
Advocacy, Communication / Social mobilization	ICC strengthening	- Engage additional potential partners - Hold, on a monthly basis, technical ICC meetings	X X	X X	X X	X X	0 0	0 0		0 0	0 0	0 0	
	Development and implementation of integrated plan of communication including routine, supplementation and surveillance activities .	- Develop and implement, with other programs, communication integrated plan - Reinforce communication activities within the VPDD - Organize meeting with NGOs and associations, including community health workers, to discuss their participation in immunization activities .	 X X	X X X	X X X	 X X	25.850 5,000 15,800	12.350 5,000 15,800		10.000			3.500
	Advocacy with respect to decision makers	Plan and hold meeting with Pharmacy directorate of MOH for NRA reinforcement			X	X	0						

								Available funding per partner					Gap
Components	**Strategies**	**Priority Activities**	**Qtr 1**	**Qtr 2**	**Qtr 3**	**Qtr 4**	**Cost estimates**	**Gov**	**USAID**	**GAVI**	**WHO**	**UNICEF**	
	Advocacy with respect to ICC partners in order to influence the MOH	Plan and hold meetings with MOH for human resource reinforcement at central VPDD level			X	X	0						
		Plan to support new vaccine introduction	X	X									
Surveillance of the VPDD targeted diseases	Integrated disease surveillance and response	- Strengthen active surveillance in AFP, measles, TMN, Hib and pneumococcal infections in all districts	X	X	X	X	91.600			30.000	61.600		
		- Convene monthly meetings with focal points for AFP surveillance	X	X	X	X	0						
	Reinforce links between laboratories for different conditions (polio and measles) and immunization program	- Strengthen collaboration between the laboratories for polio and measles	X	X	X	X	0						
		- Provide sufficient reagents	X	X	X	X	22.500			22.500			
		- Reinforce the capacity of lab workers	X	X	X	X	0						

								Available funding per partner					Gap
Components	**Strategies**	**Priority Activities**	**Qtr 1**	**Qtr 2**	**Qtr 3**	**Qtr 4**	**Cost estimates**	**Gov**	**USAID**	**GAVI**	**WHO**	**UNICEF**	
	Reinforcement of Pediatric Bacterial disease surveillance (pneumococcus, Haemophilus b, meningococcus)	- Train health workers for case definition of pneumococcal disease to be reported	X	X			71.960	20.000		40.000	11.960		
		- Increase the sentinel sites for pneumococcal disease surveillance (1 by province)	X	X	X	X	22.450			22.450			
		- Provide reagents to additional identified lab	X	X	X	X	10.000				10.000		
		- Update the reporting tools which include pneumococcal disease and train them on how to complete the tools	X				10.000	10.000					

								Available funding per partner					Gap
Components	**Strategies**	**Priority Activities**	**Qtr 1**	**Qtr 2**	**Qtr 3**	**Qtr 4**	**Cost estimates**	**Gov**	**USAID**	**GAVI**	**WHO**	**UNICEF**	
	Active case-based surveillance for measles and rubella by the way of integrated surveillance for vaccine-preventable diseases	- Strengthen active surveillance for measles in all districts - Conduct monthly meetings for surveillance focal points - Develop district level emergency preparedness and prevention plans - Strengthen analysis and use of data at all levels	X X X X	X X X	X X X	X X X	14.500 0 5.000 5.000	9.000 5.000			5.500 5.000 		
	Capacity-building for VPDD surveillance and AEFI	- Train new district focal points in AEFI, AFP, measles, MNT and pneumococcocal disease	X	X	X	X	25.000	5.000		10.000			10.000
Vaccine supply, cold chain, logistics	Regular high quality vaccine supply at all levels	- Order and supply vaccines to all districts - Provide to all health centers with motorbikes - Provide country with growth monitoring cards	X X X	X X 	X X 	X X 	4.029.866 200.000 40.345	1.293.366 40.345		2.736.500 			 200.000

								Available funding per partner					Gap
Components	**Strategies**	**Priority Activities**	**Qtr 1**	**Qtr 2**	**Qtr 3**	**Qtr 4**	**Cost estimates**	**Gov**	**USAID**	**GAVI**	**WHO**	**UNICEF**	
management	Increase cold chain storage capacity to accommodate rotavirus vaccine	- Purchase additional refrigerators, cold boxes and vaccine carriers for districts and health centers	X	X			$431,378						
	Regular auto-disable (AD) syringes supply to all districts	- Provide AD syringes to all districts - Build 5 incinerators for 5 hospitals	X X	X X	X X	X X	197.873 20.000	197.873		20.000			
	Improvement of means of transportation at the central level	Provide 1 additional 4x4 vehicle to the national VPDD		X			35.000			35.000			
	Vaccine management improvement	- Train health workers in vaccine stock management - Provide appropriate management tools at district level - Supervise teams at district and health facility levels - Monitor vaccine wastage	X X X X	X X X X	X X X X	X X X X	60.000 23.540 60.000 10.500	 10.500		60.000 13.040 30.000	 30.000 10.500		

								Available funding per partner					Gap
Components	**Strategies**	**Priority Activities**	**Qtr 1**	**Qtr 2**	**Qtr 3**	**Qtr 4**	**Cost estimates**	**Gov**	**USAID**	**GAVI**	**WHO**	**UNICEF**	
Program management and Capacity building	VPDD management improvement at all levels	- Hold technical ICC meeting on a monthly basis	X	X	X	X	0						
		- Develop on job-training plan	X	X	X	X	0						
		- Implement the plan for all the district health workers	X	X	X	X	20.000			20.000			
		- Supervise districts and health facilities	X	X	X	X	22.500	22.500					
		- Train health workers in VPDD management	X	X	X	X	22.450			22.450			
		- Improve the management of data through continuing education, monitoring, and feedback to all levels	X	X	X	X	10.000				10.000		
	Analyses to improve efficiency, effectiveness, access, and use of services	- Conduct operational researches (OR) on integrating other health interventions with immunization	X	X	X	X	72.500			72.500			
	Maintain existing links and explore integration of immunization	- Integrate vitamin A supplementation into routine vaccination	X	X	X	X	0						
			X	X	X	X	0						

								Available funding per partner					Gap
Components	**Strategies**	**Priority Activities**	**Qtr 1**	**Qtr 2**	**Qtr 3**	**Qtr 4**	**Cost estimates**	**Gov**	**USAID**	**GAVI**	**WHO**	**UNICEF**	
	services with other high impact health interventions	- Collaborate in the implementation of IMCI through routine vaccination - Monitor performance with integrated interventions	X	X	X	X	31.990			31.990			

X. Multi-Year Plan Costing for RWANDA (in US$) - Summary Table

Multi-Year Plan Costing for RWANDA (in US$) - Summary Table

		Costs		
cMYP Component		**2011**	**2013**	
		US$	**US$**	
	Vaccine Supply and Logistics	$2,864,881	$21,267,661	$2
	Service Delivery	$310,840	$327,760	$
	Advocacy and Communication	$15,000	$225,418	$
	Monitoring and Disease Surveillance	$41,667	$450,836	$
	Programme Management	$797,366	$1,138,600	$1
	Supplemental Immunization Activities	$68,591	$6,137,182	
	Shared Health Systems Costs	$2,863,322	$2,920,588	$2
GRAND TOTAL		**$6,961,666**	**$32,468,045**	**$2**

Annualized capital costs ?

Y Select Y if you want annualized capital costs (by straight line depreciation).

		Costs		
Cost Category		**2011**	**2013**	
Routine Recurrent Costs		**US$**	**US$**	
	Vaccines (routine vaccines only)	$1,230,794	$16,708,682	$16
	Traditional	$649,794	$418,790	$
	Underused	$229,500	$3,367,054	$3
	New	$351,500	$12,922,839	$12
	Injection supplies	$263,699	$501,657	$

	Personnel	$310,840	$327,760	$
	Salaries of full-time NIP health workers (immunization specific)	$250,744	$264,406	$
	Per-diems for outreach vaccinators/mobile teams	$39,360	$40,147	$
	Per-diems for supervision and monitoring	$20,736	$23,207	$
	Transportation			
	Fix site strategy (incl. vaccine distribution)			
	Outreach strategy			
	Mobile strategy			
	Maintenance and overhead	$907,068	$829,840	$
	Cold chain maintenance and overheads	$207,888	$1,927	
	Maintenance of other capital equipment	$157,500	$275,400	$
	Building overheads (electricity, water…)	$541,680	$552,514	$
	Short-term training	$7,429	$180,334	$
	IEC/social mobilization	$15,000	$225,418	$
	Disease surveillance	$41,667	$450,836	$
	Programme management	$248,257	$405,752	$
	Other routine recurrent costs			
	Subtotal	**$3,024,754**	**$19,630,280**	**$2**
Routine Capital Costs				
	Vehicles	$29,000	$44,880	$
	Cold chain equipment	$346,000	$2,633,514	$2
	Other capital equipment	$630,000	$1,101,600	$1
	Subtotal	**$1,005,000**	**$3,779,994**	**$3**
Campaign Costs				
	Polio campaign (for 0-59 months old children in Table 0.0)	$68,591		
	Vaccines and Injection Supplies	$26,572		
	Operational costs	$42,019		
	Measles -Rubella (9 months - 14 years of age) Campaign in Table 0.0)		$6,137,182	
	Vaccines and Injection Supplies		$3,040,932	
	Operational costs		$3,096,251	
	Specify (Campaigns in Table 0.0)			
	Vaccines and Injection Supplies			

	Operational costs			
	Specify Campaign in Table 0.0			
	Vaccines and Injection Supplies			
	Operational costs			
	Specify Campaign in Table 0.0			
	Vaccines and Injection Supplies			
	Operational costs			
	Specify Campaign in Table 0.0			
	Vaccines and Injection Supplies			
	Operational costs			
	Specify Campaign in Table 0.0			
	Vaccines and Injection Supplies			
	Operational costs			
	Specify Campaign in Table 0.0			
	Vaccines and Injection Supplies			
	Operational costs			
	Specify Campaign in Table 0.0			
	Vaccines and Injection Supplies			
	Operational costs			
	Specify Campaign in Table 0.0			
	Vaccines and Injection Supplies			
	Operational costs			
	Subtotal	**$68,591**	**$6,137,182**	
Shared Health Systems Costs				
	Shared personnel costs	$2,850,322	$2,907,328	$2
	Shared transportation costs			
	Construction of new buildings	$13,000	$13,260	$
	Subtotal	**$2,863,322**	**$2,920,588**	**$2**
GRAND TOTAL		**$6,961,666**	**$32,468,045**	**$26**
	Routine Immunization	**$6,893,075**	**$26,330,862**	**$26**
	Supplemental Immunization Activities	**$68,591**	**$6,137,182**	