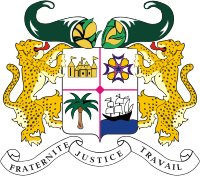
**Ministry of Health**



**Republic of Benin**

**National Agency for Vaccination and Primary Healthcare**

**(ANV-SSP)**

**```````````````**

ROTAVIRUS VACCINE INTRODUCTION PLAN OF THE EPI

**January 2017**

***Tables of contents***

*Acronyms ..................................................................................................................................4*

*List of figures .............................................................................................................................5*

*Executive summary....................................................................................................................6*

1. *General information on Benin ...............................................................................................8*
2. *Healthcare sector overview...................................................................................................10*
   1. Organisation of the healthcare system.............................................................................. 10
   2. Epidemiological profile in Benin............................................................................................. 12
   3. Situational analysis for the Expanded Programme on Immunisation (EPI)............................. 13
      1. Institutional and management framework ........................................................................................13
      2. Provision of vaccination services .......................................................................................................13
      3. Quality of vaccines and cold chain situation.......................................................................................15

2.3.3.1. Supply and quality of vaccines..........................................................................................................15

* + 1. Cold chain situation..............................................................................................................................15
    2. Communication ...................................................................................................................................17
    3. Data management................................................................................................................................17
    4. Human resources..................................................................................................................................18
    5. Funding .................................................................................................................................................18
  1. EPI Performance…………........................................................................................................ 18
     1. Vaccination coverage .............................................................................................................................18
     2. Monitoring of vaccine-preventable diseases and adverse event following immunisation (AEFI)..........19

2.4.2.4. Monitoring of AEFI ..............................................................................................................................21

2.4.4. Introductions of new vaccines and lessons learnt .................................................................................21

3.2.1. General objective...................................................................................................................................22

3.2.2. Specific objectives..................................................................................................................................22

* + 1. Choice of vaccine*...............................................................................................................22*
    2. Means of introduction*........................................................................................................3*

3.3. Information on the rotavirus vaccine and vaccination schedule ......................................................... 23 *IV.* Strategies and activities*.........................................................................................................*24

* + 1. Improving services delivery *...................................................................................................................*24
    2. Strengthening labour capacity *..............................................................................................................*.25
    3. Strengthening monitoring and assessment of the introduction process ................................................25
    4. Building cold chain storage capacity ......................................................................................................26
    5. Improving supply and management of vaccines.....................................................................................26
    6. Strengthening advocacy, social mobilisation and communication for behavioural change...................27
    7. Strengthening monitoring of rotavirus and AEFI....................................................................................28
       1. Improving monitoring of rotavirus infections....................................................................................28
       2. Monitoring of AEFI.............................................................................................................................29
    8. Strengthening of coordination and integration of interventions...........................................................29
    9. Financial sustainability...........................................................................................................................29
    10. Operational research.............................................................................................................................29

1. Timeframe of activities introducing RVV.........................................................................31
2. Budget for introducing rotavirus vaccine.........................................................................36

**Acronyms**

|  |  |
| --- | --- |
| ***BCG*** | : Bacille de Calmette et Guérin (immunisation against tuberculosis) |
| ***CCIA*** | : Inter-Agency Coordination Committee for EPI |
| ***CNHU-HKM*** | : Hubert Kutuku Maga National Teaching Hospital (Centre National Hospitalier Universitaire Hubert Kutuku Maga) |
| ***CNCV*** | : National Consultative Committee for Vaccination |
| ***ANV-SSP*** | : National Agency for Vaccination and Primary Healthcare |
| ***DTWC*** | : Diphtheria Tetanus Whooping Cough |
| ***GAVI*** | : Global Alliance for Vaccine and Immunisation |
| ***Hep B*** | : Viral Hepatitis B |
| ***Hib*** | : Haemophilus Influenzae Type B |
| ***IEC*** | : Information, Education and Communication |
| ***CF*** | : Cerebral Fluid |
| ***AEFI*** | : Monitoring of Adverse Post Immunisation Signs (AEFI) |
| ***WHO/AFRO*** | : World Health Organization for Africa |
| ***EPI*** | : Expanded Programme on Immunisation |
| ***AFP*** | : Acute flaccid paralysis |
| ***MPA*** | : Minimum Activity Package |
| ***MR*** | : Measles-Rubella |
| ***GCPH*** | : General Census of Population and Habitat |
| ***TI*** | : Trans Isolate |
| ***YFV*** | : Yellow Fever Vaccine |
| ***AMV*** | : Anti-Measles Vaccine |
| ***HIV/AIDS*** | : Human Immuno-Deficiency Syndrome/ Acquired Immune Deficiency Syndrome |
| ***IPV*** | : Inactivated Poliomyelitis Vaccine |
| ***OPV*** | : Oral Poliomyelitis Vaccine |

## LIST OF TABLES

[Table 1: Socio-demographic indicators of Benin 8](#_Toc474858255)

Table 2: National healthcare system in Benin................................................................................. 11

[Table 3: Distribution of vaccines used in the Benin EPI according to year of introduction 16](#_Toc474858256)

[Table 4: Positive vaccine storage capacity and costs for main facility 18](#_Toc474858257)

Table 5: Positive vaccine storage capacity and costs for intermediate storage ……………..... 14

Table 6: Rotavirus monitoring indicators, West African countries, 2015 ................................ 20

Table 7: Operational characteristics of Rotarix® and Rotateq® vaccines ................................. 23

Table 8: Vaccination schedule for infants in Benin ................................................................. 23

Table 9: Dosage, sites and means of administering infant vaccines in Benin ......................... 24

Table 10: Estimated needs for rotavirus vaccines in Benin in 2018 ........................................ 27

## LIST OF FIGURES

Figure 1: Administrative map of Benin .................................................................................... 9

Figure 2: Development of vaccination coverage from 1990 to 2015 in Benin ....................... 18

Figure 3: EPI performance indicators among children in Benin’s 85 municipalities

2014 (n= 17 789) ..............................................**Error! Bookmark not defined.**

Figure 4: supply circuit of vaccines and consumables in Benin in 2016 ...... **Error!**

**Bookmark not defined.**

Figure 5: Projection of resources requirements for vaccination in Benin until 2018

..............................................................................................**Error! Bookmark not defined.**

## EXECUTIVE SUMMARY

Benin is a West African countrywith an area of **114,763 km2** and an estimated population of 11,852,802 inhabitants[[1]](#footnote-1) in 2018 and a population growth rate of 3.5%. In 2015, Benin ranked 140th out of 198 countries[[2]](#footnote-2) in terms of revenue with GDP per capita of US$ 708.98, or CFAF 354,500[[3]](#footnote-3).

According to the general population and habitat census 2013 (RGPH -4), and the EDSB4, the infant mortality rate is **68.1 per 1,000**.  According to data published by the WHO/UNICEF in 2014 (in Benin), childhood diarrhoea was the third leading cause of death among children under five years after malaria and pneumonia.

Benin’s epidemiological profile is characterised by a predominance of endemo-epidemic conditions including: malaria, diarrhoea and other gastro-intestinal conditions, acute respiratory infections, and anemia. Certain vaccine-preventable diseases such as measles, rubella and rotavirus diarrhoea are still being recorded. Acute gastroenteritis (AG) in children under five years of age remains a public health problem and rotaviruses are one of the causes of such diarrhoea. Almost all children aged three months to five years are often infected in both urban and rural areas in developing countries, in Africa[[4]](#footnote-4) in particular.

The EPI, which began in Benin in 1982, aims to reduce morbidity and mortality in connection with vaccine-preventable diseases.

Immunisation services are offered in 855 HCs throughout the country, indicating that access to immunisation services is satisfactory, as evidenced by 86% pentavalent 1 immunisation coverage. On the other hand, continuity raises some problems because the drop-out rate between the first and third dose of pentavalent was 9.4% in 2014 and the drop-out rate between BCG and AMV was very high (19%)[[5]](#footnote-5).

To reduce infant mortality from acute diarrhoea due to rotavirus on the horizon in 2025, the WHO, with the support of UNICEF, recommends the introduction of the rotavirus vaccine in all national immunisation programmes. This vaccine should be considered a priority in countries with high gastroenteritis mortality rates, in this case those in sub-Saharan Africa.

In view of the magnitude and consequences of the phenomenon and pursuant to international recommendations (of the WHO), Benin has submitted the matter for assessment by CNCV-Benin.

As CNCV-Benin has taken into account the international and national context (diarrhoea developing into

Rotavirus in 2013-2016) and the opportunity to offer the GAVI vaccine, it has recommended introducing the anti-MR vaccine in the routine EPI.

Two oral vaccines are marketed internationally: Rotarix® and RotaTeq®. In Benin, Rotarix® will be used on the basis of its operational characteristics.

Every child should receive two doses of the vaccine four weeks apart in order to be protected. The first dose is administered at six weeks old. The coverage objective is 50% in 2018.

Fixed and advanced strategies have been selected. The various documents prepared have made it possible to take into account the preconditions which comprise evaluation of need for vaccines and consumables as well as their storage volume, evaluation and readjustment of storage capacities at all levels and training of stakeholders. Information, education and communication to support the introduction of this vaccine are an important component and shall form the basis of a communication plan.

This present vaccine introduction plan against rotavirus infections analyses the current status of the country’s immunisation programme, its purpose and its objectives, and identifies introductory strategies and key activities to facilitate the process of successfully introducing vaccines. Therefore, a comprehensive analysis of the cold chain and other programmatic aspects and services has been conducted. This plan was developed based upon the information contained within the following documents:

* Comprehensive multi-year plan for immunization (cMYP 2015-2018)
* PCV13 post introduction assessment in 2012
* External EPI 2014 review
* Logistical assessment of the cold chain, carried out in 2012
* Review of the AFP, rubella and rotavirus monitoring data using monitoring sites.

In order to contribute to the control objectives for diarrhoeal diseases, the EPI will develop strategies for resolving priority problems observed during post-introduction evaluations of new vaccines. The main implementation strategies have been advocated for the successful introduction of the vaccine against rotavirus infections. In addition to prevention (vaccination), the EPI will work with other health sectors to integrate other high-impact interventions (hand washing with soap, breast-feeding and sanitation) and management of diarrhoea cases (TRO, zinc and vitamin A).

The overall cost for the introduction of the vaccine is US$ 1,892,942 and GAVI’s requested share is estimated at USD$ 1,549,023 of which US$ 1,346,237 is for the vaccine and US$ 202,786 as cash support.

### I. GENERAL INFORMATION ON BENIN

Benin is a country in West Africa that stretches from Niger in the north and the Atlantic Ocean to the south. It is bordered in the northwest by Burkina Faso, to the west by Togo and to the east by Nigeria. Its surface area is 114,763 km2.

The relief consists of crystalline plains and plateaux in the southern region of the country that gradually rise northwards to reach altitudes of 641m (the Atacora Range). From north to south, three climatic zones can be distinguished:

* The dry tropical climate in the north with a dry season and a rainy season.
* The Guineo-Sudanese type climate at the centre characterised by a semi-humid tropical climate.
* The humid tropical climate in the south with two rainy seasons (from April to June and from September to October) and two dry seasons from July to August and from November to March.

The population of Benin is estimated to reach 11,852,8027 inhabitants7 in 2018. Children younger than one year old are estimated to number 506,963, i.e. 4.3% of the total population, with survivors estimated at numbering 3.6% of the total population. Women of reproductive age comprise 24% of the population (2,844,672).

The table below presents the main socio-demographic indicators:

# **Table 1:** Socio-demographic indicators of Benin

|  |  |
| --- | --- |
| **Indicators** | **Value** |
| Crude birth rate (CBR) | 36.4‰8 |
| Crude death rate (CDR) | 8.5‰ |
| Infant death rate (IDR) | 68.1‰ |
| Juvenile infant death rate (JIDR) | 41‰ |
| Maternal mortality rate (MMR) | 335.5 deaths for 100,000 live births |
| Life expectancy at birth | 63.84 years |
| Life expectancy at birth for men | 59 years9 |
| Life expectancy at birth for women | 61.59 years |
| Composite fertility index (CFI) | 4.8 children per women |
| Growth rate | 3.5% |

**Sources: GCPH-4, 2013 ; EDS4, 2012-2013** (for life expectancy at birth)

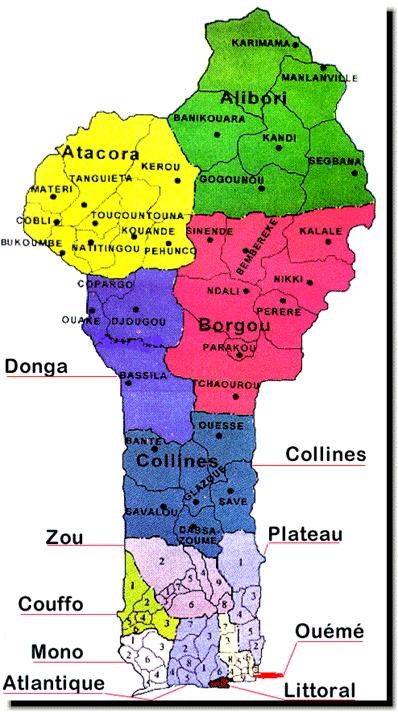
6National Geographical Institute, 1998 estimate.

7 Population projection based upon GCPH-4, INSAE, 2014 data.

#### 8GCPH-4, 2013

9EDS4, 2012-2013

Benin is subdivided into 12 departments comprising Atakora, Donga, Borgou, Albori, Zou, Collines, Mono, Couffo, Atlantique, Littoral, Ouémé and Plateau. It comprises of 77 municipalities, 546 arrondissements and 5,290 villages or city districts10.



**Figure 1:** Administrative map of Benin

In 2015, Benin ranked 140th out of 198 countries11 in terms of domestic revenue and GDP per capita was US$ 708.98, or CFAF 354,500. 12.

State allocations for the health sector increased from 71.757 billion in 2013 to 69.582 billion in 2016. However, the budget for 2017 provides for an allocation of 81 billion for the health sector.

1. Law on the creation, organisation, allocation and funding of local administrative units in the Republic of Benin.
2. Income classification by country, International Monetary Fund, nominal GDP by country 2014
3. http//www.journaldunet.com.

### II. HEALTHCARE SECTOR OVERVIEW

#### 2.1. Organisation of the healthcare system

The national healthcare system is organised into a pyramid-style structure with three levels, as indicated in the table below:

**Table 2:** *National healthcare system in Benin*

|  |  |  |
| --- | --- | --- |
| **Levels** | **Structures** | **Hospital and socio-sanitary institutions** |
| Central or national | Ministry of Health | * National hospital and university centre (CNHU-HKM) * National centre of pneumo-phtisiology * National centre of psychiatry * National Center for Gerontology |
| Intermediary or departmental | Departmental health  directorate  (DHD) | * Hôpital de la Mère et de l'Enfant Lagune (HOMEL) * Departmental hospital centre (DHC) * Centre for Information, prospective studies, counselling and consultation (CIFLC) - Anti-leprosy treatment centre (ALTC) * Centre for Buruli ulcer treatment (Allada, Lallo and Pobè) * Centre for Pneumo-phtisiology of Akron |
| Boundary | Health zone (zone office) | * Zone hospital (ZH) * Healthcare centre (HC) * Private healthcare training   - Centre for detection and treatment of tuberculosis (CTST)  - Village healthcare unit (VHU) |

**Source:** MS/DPP/SSD

In addition to public structures, Benin has a large number of private facilities offering both modern and traditional healthcare.

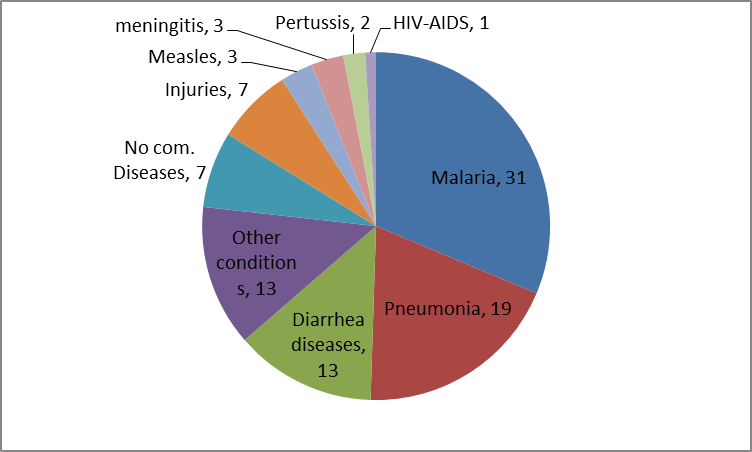
The health zone represents the operational unit for the planning, management and operation of the health system. Benin has 34 health zones. There are 855 HCs offering the Minimum Package of Activities; these include preventive, curative and promotional actions, including vaccination.

In 2015, Benin had 1,617 doctors, 5,079 nurses and 1,451 midwives in the public sector, a total of 8,147 qualified staff. The ratio of qualified staff to inhabitants is 8 per 10,000 inhabitants (WHO standards 25 per 10,000 inhabitants). However, this estimate does not take into account qualified staff working in the private sector.

For the 2009-2018 decade, Benin has developed a national health development plan (PNDS) which focuses on five priority areas, namely:

* prevention and control of disease and improvement of quality of care;
* Enhancing human resources;
* strengthening partnerships in the sector and promoting ethics and medical responsibility;
* improving the sector’s funding mechanism;
* strengthening management of the sector.

#### 2.2. Epidemiological profile in Benin



**Figure 2:** *Causes of post-neo-natal deaths, children aged 1-59 months, Benin13, 2013*

Benin’s epidemiological profile is characterised by a predominance of endemo-epidemic conditions including: malaria, diarrhoea and other gastro-intestinal conditions, acute respiratory infections, and anemia. Causes of death among newborns and children under age 5 (1–59 months of age) reported in 2013 and published by the WHO/UNICEF (Lancet 2014) have shown that diarrhoeal diseases were the third cause of death among these children, after malaria and pneumonia.

Certain vaccine-preventable diseases such as measles, rubella and rotavirus diarrhoea are still being recorded.

Rotavirus is an RNA virus belonging to the reoviridae family of viruses. The reservoir is human.

Contamination is direct or indirect fecal-oral. Rotavirus infections are one of the biggest causes of severe acute diarrhoea among infants and children under five years of age. Globally, rotaviruses are responsible for 125 million cases of infantile gastroenteritis each year and virtually all children aged three to five years are infected. In the USA, the number of annual episodes is estimated at 2.7 million including 70,000 hospitalisations. In France, rotavirus infections are believed to be responsible for 182,000 episodes of diarrhoea among children under three years of age, including 97,000 cases of severe diarrhoea. In a prospective, multi-centre study carried out in three hospitals in the city of Accra in Ghana with different levels of care for children under five years, the authors reported a high prevalence (50%) of rotavirus infection among children hospitalised for AG. This infection was detected in one in 15 children (6.4%) hospitalised during the same period, whatever the reason. The study concludes that rotavirus is responsible for more than 50% of acute severe diarrhoea among children aged three to 18 months.

In Benin, in the absence of published data, records from the 2013 to 2016 reports of the WHO-supported epidemiological monitoring site for rotavirus (Hôpital de Zone de Suru–Lere) reported 281 suspected cases of rotavirus diarrhoea among which 123 positive cases (43.7%).

#### 2.3. Situational analysis for the EPI

##### 2.3.1. Institutional and management framework

At the level of Ministry, management of the EPI is carried out by the ANV-SSP by Ministerial Decree No. 2011-413 of 28 May 2011. Its mission is to implement national health policy in the areas of vaccination and primary healthcare. At the level of the departments and municipalities, the Agency relies on several persons including the heads of departmental services, chief medical officers, EPI managers, heads of posts and their collaborators. For the coordination and implementation of these activities in addition to the Agency’s technical directorates, technical committees have been set up. These include the ICC, the national committee of experts for the eradication of poliomyelitis (CNEP), the national certification committee (CNC), the national consultative committee for vaccines and immunisation (CNCN-Benin) and the AEFI management committee. Furthermore, the NAV-PHcollaborates with all technical directorates of the Ministry of Health. The programme does not have any national regulatory authorities (NRA). For questions on this subject, the EPI addresses the National Directorate of Pharmacy and Medicines (DPMED) through its National Committee for the Supply of Health Products (CNAPS).

##### 2.3.2. Provision of vaccination services

The EPI, which began in Benin in 1982, aims to reduce morbidity and mortality in connection with vaccine-preventable diseases. Initially, the EPI focused on six diseases. Given the epidemiological context and availability, Benin has gradually introduced new vaccines into the EPI. Five new antigens were introduced (YFV, Hep B, Hib, PCV13 et IPV). Currently, the EPI can be used to fight ten (10) target diseases.

The antigens selected in the programme are administered to children aged 0-11 months, and to pregnant women. The following table presents the vaccines used in the EPI in Benin and the years in which they were introduced.

13 WHO/UNICEF/Causes of post-natal deaths among children under 5 years, Lancet 2014

# **Table 3:** Distribution of vaccines used in the Benin EPI according to year of introduction

|  |  |  |
| --- | --- | --- |
| **No.** | **Vaccine** | **Year of introduction** |
| **1** | BCG | 1982 |
| **2** | OPV | 1982 |
| **3** | DTP | 1982 |
| **4** | MCV | 1982 |
| **5** | VAT | 1982 |
| **6** | YFV | 2002 |
| **7** | Hepatitis B | 2002 |
| **8** | Hib (pentavalent) | 2005 |
| **9** | PCV13 | 2011 |
| **10** | IPV | 2015 |

Immunisation services are offered in 855 HCs throughout the country, indicating that access to immunisation services is satisfactory, as evidenced by 86% pentavalent 1 immunisation coverage. On the other hand, continuity raises some problems because the drop-out rate between the first and third dose of pentavalent is 9.4% in 2014 and the drop-out rate between BCG and AMV is very high (19%)[[6]](#footnote-6).

It is recommended that immunisation be conducted daily in all vaccination units. However, in reality daily vaccination is done in 40% of HCs and all antigens are offered at each immunisation session in 35% of HCs.

Vaccination of target groups is implemented as a fixed strategy and as an advanced strategy. These two strategies will both by complemented by other ad hoc approaches, such as the active search for individuals out of touch, sweep operations, etc. Moreover, in Benin, in addition to the introduction of a rotavirus vaccine, it is proposed that the routine EPI vaccine against MR be introduced in its routine vaccination programme.

##### 2.3.3. Quality of vaccines and cold chain situation

###### 2.3.3.1. Supply and quality of vaccines

The State of Benin and its partners contribute to the purchase of traditional vaccines and the co-financing of new vaccines (existence of a budget line, etc.). As part of the vaccination independence initiative, Benin has been buying all the traditional vaccines (BCG, OPV, VAT and MCV) since 1996 and contributes to the acquisition of new vaccines and underused vaccines through co-financing with GAVI. Depending on how funding for EPI vaccines evolved from 2012 to 2015, Benin remains heavily dependent on GAVI subsidies (about 90%) for the supply of underused vaccines or new vaccines.

Attention is paid to strengthening the supply chain at all levels, in particular by increasing CDF equipment coverage in HCs and the reliability of equipment, and by maintaining rolling stock and CDF equipment in good working order at all levels to ensure a steady supply of vaccines and other inputs.

With respect to the vaccine against rotavirus infections, the current cMYP will end in 2018 and will not allow the demand for support to go beyond this year, and the country will, in 2018, develop another cMYP, an introductory report of the rotavirus vaccine and estimate the rotavirus vaccine requirements for the remaining four years to submit to GAVI.

##### 2.3.4. Cold chain situation

The analysis of forecasts for storage capacity requirements (cold chain equipment coupled with physical inventory of cold chain equipment) by level gave the following results:

The cold chain across the country comprises:

* At central level: For the total net positive current capacity for cold chain, it is 54,000 litres whereas the required capacity is 28,034 litres for 2018. There is therefore no additional need for equipment required at this level.
* At intermediate level: Storage capacity of central and intermediary facilities are presented as follows

# **Table 4:** Positive vaccine storage capacity and costs for main facility

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | **2013** | **2014** | **2015** | **2016** | **2017** | **2018** |
| **A** | Net storage capacity required for CDF  (litres) | *Capacity required* | 22,064 litres | 21,192 litres | 18,880 litres | 21,013 litres | 22,287 litres | 28,034 litres |
| **B** | Existing net total positive capacity for cold chain | *Current net capacity* | 54,000 litres | 54,000 litres | 54,000 litres | 54,000 litres | 54,000 litres | 54,000 litres |
| **C** | Additional net capacity installed | *Additional capacity expected* | 0 litres | 0 litres | 0 litres | 0 litres | 0 litres | 0 litres |
| **D.** | Existing net total positive capacity | *Total capacity*  *made available* | 54,000 litres | 54,000 litres | 54,000 litres | 54,000 litres | 54,000 litres | 54,000 litres |
| **E** | Difference (where applicable) | *A-D* | - 31,936  litre | - 32,808 litres | 35,120 litres | 32,987 litres | - 31,713 litres | - 25,966 litres |

The central storage facility has sufficient capacity for the introduction of the rotavirus vaccine.

**Table 5:** *Positive vaccine storage capacity and costs for intermediate storage in 2017*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Forms** | **Atocora** | **Atlantique** | **Borgou** | **Mono** | **Ouémé** | **Zou** |
| **A** | Annual total volume of vaccines in positive storage | *Figure obtained by multiplying the*  *total number of*  *vaccine doses per volume per dose* | 3,057 litres | 4,826 litres | 4,836 litres | 3,108 litres | 4,309 litres | 3,645 litres |
| **B** | Existing net total positive capacity for cold chain | *#* | 5,000 litres | 6,000 litres | 5,500 litres | 634 litres | 591 litres | 5,300 litres |
| **C** | Estimated minimum number of annual shipments required for actual cold chain capacity | *A/B* | 0.61 | 0.80 | 0.88 | 4.90 | 7.29 | 0.69 |
| **D.** | Annual number of shipments | *Based on the national vaccine*  *distribution plan* | 4 | 4 | 4 | 6 | 6 | 4 |
| **E** | Difference (where applicable) | *((A\*(1/D+Reserve/1*  *2) - B)* | **-3726.2868** | **3,989 litres** | **3,485 litres** | **143 litres** | **486 litres** | **3,781 litres** |

For the departments, only the repositories of Mono and Ouémé which have a deficit for a quarterly supply. To avoid this insufficiency, one month of refuelling will be done until the installation of its cold room (30,000 litres gross), the acquisition process of which is ongoing.

The majority of the municipalities have sufficient capacity to maintain all vaccine requirements of their health areas and to freeze accumulators.

The supply and storage chain of vaccines and vaccine consumables is modeled on the health pyramid and comprises three levels: the central level (Ministry), the intermediate level (department) and the peripheral level. The central level and four of the six departmental repositories are equipped with cold rooms. The other facilities use refrigerators and freezers for the storage of vaccines. The vaccine supply system is well defined and complied with throughout the country (ordering period and storage level compliance). Inventory management of vaccines and consumables is computerised (SMT tool) up to intermediate level. However, the bases are not updated whenever products are moved. Syringes used for vaccination and healthcare are destroyed by incineration. In terms of logistics, efforts remain to be made in terms of equipment maintenance, the development of a cold chain and rolling stock depreciation plan and the development of standard operating procedures (SOPs) for logistics.

##### 2.3.5. Communication

Communication supporting the EPI employs the following main strategies:

* advocacy,
* social mobilisation,
* communication for development (C4D).

The external EPI 2014 review revealed several shortcomings in the implementation of EPI development communication activities. Among these weaknesses are:

* lack of communication plan for the routine EPI at all levels;
* lack of financial indicators for EPI communication activities;

(Lack of a permanent contract with the media for routine vaccination);

* leaders hardly involved in EPI activities;
* NGOs hardly involved in raising awareness about the EPI.

To address these shortcomings, a draft communication plan for routine vaccination was prepared and UNICEF provided an expert for its finalisation.

##### 2.3.5. Data management

EPI data is collected at all vaccination units using SNIGS media and sent to the Agency at a specific frequency. There are still problems relating to promptness and data quality.

Availability of EPI management tools (tools for data collection, reporting and HBR tools) are updated by taking into account new vaccines to be included in the routine EPI.

##### 2.3.6. Human resources

At the level of Ministry, the EPI has its own staff for the ANV-SNP. At intermediary and peripheral level, EPI activities are integrated into the MPA and rely on human resources available. Trained and sufficient staff are available at all levels.

##### 2.3.7. Funding

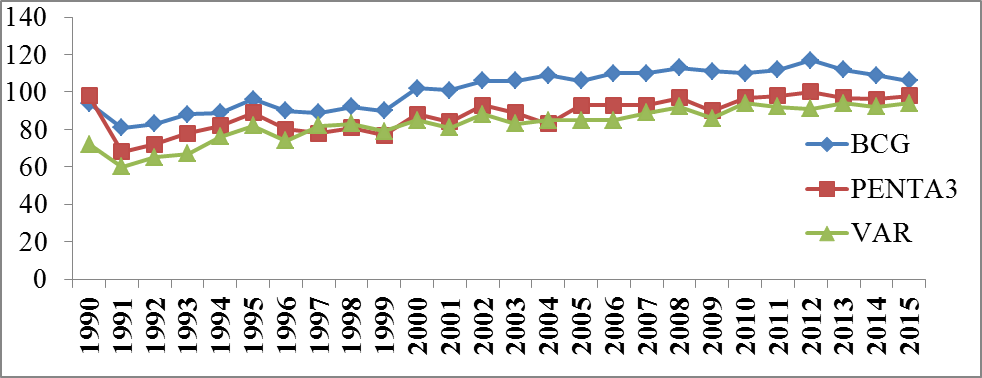
In the context of the vaccination independence initiative, Benin has been buying all traditional vaccines (BCG, OPV, ATV and MCV) since 1996 and contributes to the acquisition of all new vaccines and underused vaccines through co-financing with GAVI. Depending on how funding for EPI vaccines evolved from 2012 to 2015, Benin remains heavily dependent on GAVI subsidies (about 90%) for the supply of underused vaccines or new vaccines.

For 2015, the total cost of routine EPI and additional immunisation , chain cold and logistics activities amounted to 3,745,884,619 CFA francs, including 1,776,922,000 CFA francs financed by GAVI, 914,111,000 francs CFA by other partners and 1,054,851,619 by the Government of Benin.

#### 2.4. EPI performance

##### 2.4.1. Vaccination coverage

The evolution of antigen-based administrative vaccination coverage is presented in the graph below:



### Source: ANV-SSP

**Figure 3:** *Development of vaccination coverage from 1990 to 2015 in Benin*

Whatever the antigen in question, vaccination coverage has remained relatively stable over the past ten years.

Contrary to the good performance revealed based by administrative data, WHO-Unicef ​​estimates place DTP-Hib-HepB3 coverage at less than 85% (75% in 2014 and 79% in 2015).

The external EPI 2014 review revealed a BCG coverage of 98% (scar) and showed 76% of children were fully vaccinated (notebook + history).

* However, the survey also revealed that efforts must be made for:
* the storage of vaccination documents by parents,
* compliance with the vaccination schedule (35% of valid ECV).

#### 2.4.2. Monitoring of vaccine-preventable diseases and AEFI

The monitoring system takes into account all levels of the healthcare pyramid. Like most countries in the sub region, Benin has put in place an integrated disease surveillance and response system in all healthcare training programmes. This system allows data to be collected concerning monitored diseases and other health events (AEFI).

In the surveillance of vaccine-preventable diseases, special attention has been given to the surveillance of AFP and measles cases. Performance indicators for these two conditions have evolved within satisfactory limits. For polio (AFP surveillance), between 2005 and 2015, the rate of non-polio AFP fluctuated between 1.9 and 4.3 per 100,000 children under the age of 15 years. The indicator “AFP cases with stool samples collected within 14 days” ranged from 81% to 99% for the same period.

For the same period (2005 to 2015), surveillance indicators for measles evolved as follows:

* the rate of non-measles eruption per 100,000 inhabitants varied from 0.5 to 3 (this indicator fell within standards (> = 2 cases per 100,000 inhabitants) for just four years out of 11.
* The proportion of cases notified and collected between 28% and 98%. Standards 80% at least. This standard was reached for just three years out of 11.
* The proportion of municipalities which reported a blood sample went from 44% to 92% (standard: 80% at least). This standard was reached for just five years out of 11 in the period.

### Improving monitoring of rotavirus infections

The situation concerning rotavirus infections remains a public health problem in West Africa and Benin in particular. Indeed, WHO rotavirus surveillance data in the sub region show that by 2015, 31% of the samples collected were positive for rotavirus (see table below).

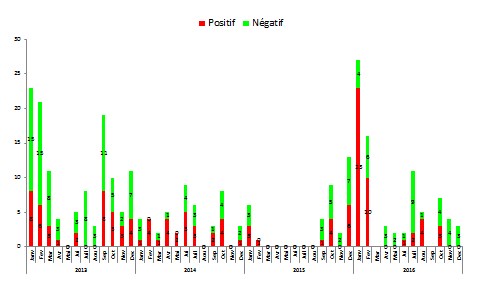
**Table 6** *Rotavirus monitoring indicators, West African countries, 2015*

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Country code** | **Total number of acute**  **diarrhoea**  **cases** | **Total**  **number eligible acute**  **diarrhoea**  **cases** | **% eligible acute**  **diarrhoea cases**  **(T=80%)** | **cases with stool**  **specimen collected within two days** | **% cases**  **with stool specimen collected within two days**  **(T=90%)** | **Stool specimens**  **that arrive at**  **lab for ELISA testing** | **% stool specimens**  **that arrive at**  **lab for ELISA testing**  **(T=95%)** | **Received specimens that are tested** | **% received specimens that are tested**  **(T=80%)** | **Tested positive for rotavirus** | **% tested positive for**  **rotavirus**  **(T=30%)** |
| BEN | 35 | 35 | 100 | 32 | 91 | 35 | 100 | 35 | 100 | 15 | 43 |
| BFA\_CHRG | 188 | 188 | 100 | 156 | 83 | 174 | 93 | 174 | 100 | 52 | 30 |
| BFA\_CHUC | 124 | 124 | 100 | 89 | 72 | 124 | 100 | 124 | 100 | 21 | 17 |
| BFA\_CHUY | 118 | 118 | 100 | 90 | 76 | 107 | 91 | 107 | 100 | 7 | 7 |
| BFA\_CMA | 154 | 154 | 100 | 99 | 64 | 148 | 96 | 148 | 100 | 23 | 16 |
| CIV | 325 | 325 | 100 | 274 | 84 | 325 | 100 | 325 | 100 | 118 | 36 |
| GAM | 83 | 83 | 100 | 82 | 99 | 83 | 100 | 83 | 100 | 9 | 11 |
| GHA\_ACCRA | 385 | 385 | 100 | 304 | 79 | 345 | 90 | 344 | 100 | 85 | 25 |
| GHA\_KUM | 103 | 103 | 100 | 75 | 73 | 44 | 43 | 44 | 100 | 10 | 23 |
| LIB |  |  |  |  |  |  |  |  |  |  |  |
| NIE\_UITH | 233 | 233 | 100 | 186 | 80 | 233 | 100 | 233 | 100 | 62 | 27 |
| NIE\_UNTH | 494 | 494 | 100 | 469 | 95 | 494 | 100 | 494 | 100 | 254 | 51 |
| NIG | 131 | 131 | 100 | 129 | 98 | 131 | 100 | 130 | 99 | 50 | 38 |
| SEN | 123 | 123 | 100 | 111 | 90 | 121 | 98 | 120 | 99 | 17 | 14 |
| SIL |  |  |  |  |  |  |  |  |  |  |  |
| TOG\_BE | 119 | 119 | 100 | 108 | 91 | 116 | 97 | 115 | 99 | 41 | 36 |
| TOG\_CHU | 69 | 69 | 100 | 59 | 86 | 61 | 88 | 61 | 100 | 19 | 31 |
| West Africa Network | 2,684 | 2,684 | 100 | 2,263 | 84 | 2,541 | 95 | 2,538 | 100 | 783 | 31 |

*Source: WHO, overview of Rotavirus Surveillance in West Africa in 2015*

In Benin, AG remains a public health problem despite basic hygiene and environmental sanitation measures and the promotion of breastfeeding. In Benin, in the absence of published data, records from the 2013 to 2016 report of the epidemiological monitoring site for rotavirus (Hôpital de Zone de Suru–Lere) reported 281 cases of children under five years having suspected rotavirus diarrhoea among which 123 positive cases (43.7%).

The graph below shows how cases of tested, positive AG evolved in Benin from 2013 to 2016.



**Figure 4:** *Evolution of cases of tested, positive AG in Benin from 2013 to 2016.*

*.*

*Source:* *WHO Benin, data from monitoring sites for rotavirus diarrhoea from 2013 to 2016*

#### 2.4.3. Monitoring of AEFI

Surveillance of AEFI is not routine at the level of healthcare training. Data transmission is the same as that of diseases with epidemic potential.

A policy/guidelines on conduct in the event of AEFI is available, but health workers are not always trained in these measures. A national committee of AEFI experts

was established during the organisation of the meningitis A campaign (MenAfrivac) and continues to coordinate case management of AEFI.

According to the external EPI 2014 review, cases of AEFI were observed during the last six months in 15% of HCs. Recording of AEFI cases was consistent in only 20% of HCs. Similarly, documentation of these cases in the form of a report, a notice or an investigation was effective in less than 15% of the HCs.

#### 2.4.4. Introduction of new vaccines and lessons learned

Since 2002, Benin has been involved in the process of introducing new vaccines, which have contributed to the expansion of the national immunisation schedule and to the strengthening of the routine EPI (YFV in 2002, vaccine against viral hepatitis B (Hep B) in 2002, vaccine against haemophilus influenzae type b (Hib) infections in 2005, vaccine against pneumococcal infections in 2011, inactivated polio vaccine (IPV) in 2015).

From these experiences, the following main lessons have been learned and will be used for the introduction of the vaccine against rotavirus infections in the country:

* Effective and timely implementation of preparatory activities (at least 8–12 months) improves the quality of the new vaccine’s introduction;
* The introduction of new vaccines still requires additional storage capacity to accommodate new vaccines: prior assessment

of the cold chain makes it possible to identify needs and define the necessary gap.

* Specific training of health workers involved in vaccination activities at all levels for operational components improves the quality of services;
* Taking into account the development of appropriate communication messages serves to address health workers’ and parents’ concerns in relation to the new vaccine;
* Taking into account the high cost and co-financing of the new vaccines, good advocacy should be conducted before the political authorities and donors.
* Training on AEFI should be incorporated into the Health Staff Training Package to minimise parental concerns about the occurrence of phenomena wrongly or wrongly attributed to the new vaccine.

#### 3.2. OBJECTIVES

**3.2.1. General objective**

Contribute to the reduction of mortality linked to rotavirus.

##### 3.2.2. Specific objectives

* Prepare EPI managers and health workers to introduce the rotavirus vaccine in Benin (adapt generic WHO training modules, train health workers at all levels, revise EPI management tools, etc.).
* Encourage populations (decision-makers, the media, populations and other influential people) to accept the introduction of the rotavirus vaccine (prepare them to introduce and accept this new vaccine).
* Increase vaccine storage capacity at all levels.
* Improve storage and vaccine distribution measures at all levels.
* Achieve at least 50% vaccination coverage of the rotavirus vaccine in the affected areas during the first year of introduction.
* Improve the system for monitoring rotavirus infections and cases of

AEFI

##### 3.2.3. Choice of vaccine

Following the CNCV’s recommendations, the Ministry of Health, in coordination with the technical partners, has decided to introduce the rotavirus vaccine in 2018. Two types of rotavirus vaccines are currently available (Rotarix® - manufactured by GSK and

Rotateq® – manufactured by Merck). Both vaccines are administered orally, and are effective and safe. Both vaccines differ mainly in their operational characteristics (vaccination schedule, existence of vaccine control vials and in keeping with packaging volume for storage in refrigerators and shipment).

**Table 7:** *Operational characteristics of Rotarix® and Rotateq® vaccines*

|  |  |  |
| --- | --- | --- |
| **Operational characteristics** | **Rotarix** | **Rotateq** |
| Packaging volume | 17.1 ml / 50 doses | 46. 3 ml / 25 doses |
| Dosage and administration method | 1.5 ml orally | 2 ml orally |
| Vaccine vial monitor | Available | Unavailable |
| Doses required | 2 | 3 |
| Vaccine cost per dose | $2,248 | $2,248 |

On the basis of these characteristics, the Benin CNCV has recommended that the Benin EPI use the Rotarix® vaccine in its routine vaccination programme.

##### 3.2.4. Means of introduction

Drawing lessons from previous experiences on the introduction of new vaccines, including PCV13 in 2011 and IPV in 2015, Benin has chosen national introduction throughout the country.

#### 3.3. Information on the rotavirus vaccine and vaccination schedule

Vaccines currently available contain live, attenuated, human and/or animal-derived, oral and replicating strains in the small intestine.

In Benin, it is the monovalent vaccine Rotarix® which will be used. This is a live vaccine prepared with an isolated strain from a case of infantile gastroenteritis. It should be stored between + 2 °C and + 8 °C, away from light. It should not be frozen and its shelf life is three years.

Every child should receive two doses of Rotarix® four weeks apart in order to be protected. The first dose is administered at six weeks old at the same time as the DTP-Hib-HepB1.

NB: It is preferable that both doses be administered before 24 weeks of age.

**Table 8:** *Vaccination schedule for infants in Benin*

|  |  |  |
| --- | --- | --- |
|  | **Vaccines** | **Age of administration** |
| BCG | OPV 0 | At birth |
| OPV 1 | Pentavalent 1 (DTP-HepB-Hib1), PCV13\_1, RV1\_1 | At the sixth week |
| OPV 2 | Pentavalent 2 (DTP-HepB-Hib2), PCV13\_2, RV1\_2 | At the tenth week |
| OPV 3 | Pentavalent 3 (DTP-HepB-Hib3),  PCV13\_3  IPV | At the fourteenth week |
| MR | YFV | At nine months |

The table below shows the doses, sites and administration means for antigens on the vaccination schedule in force in Benin.

**Table 9:** *Dosage, sites and means of administration of infant vaccines in Benin*

|  |  |  |  |
| --- | --- | --- | --- |
| **Antigens** | **Doses** | **Sites** | **Administration**  **Means** |
| BCG | 0.05 ml | External surface 1/3 upper left forearm | Intra dermal |
| OPV | Two drops | Mouth | Oral |
| Pentavalent  (DTP-HepB- Hib) | 0.5 ml | Deltoid left arm | Deep intramuscular injection |
| Rotavirus 1 | 1.5 ml | Mouth | Oral |
| IPV | 0.5 ml | Anterior surface right thigh | Deep intramuscular injection |
| PCV13 | 0.5 ml | Anterior surface left thigh | Deep intramuscular injection |
| MR | 0.5 ml | Right arm | Subcutaneous |
| YFV | 0.5 ml | Right thigh | Subcutaneous |

### IV. STRATEGIES AND ACTIVITIES

The strategy to introduce the vaccine against rotavirus infections in Benin will consist of identifying factors that may jeopardize the introduction process to address them and of integrating strategies currently available in the national EPI to improve the routine vaccination system.

In order to achieve these objectives defined in the cMYP, the Benin EPI will implement the following strategies.

#### 4.1.1. Improving services delivery

Strategies to improve immunisation coverage and reduce drop-outs will be linked to the implementation of vaccination strategies in fixed and advanced sites, the increase in the number of HCs providing immunisation services and the increase of immunisation sessions. The following activities may be offered: Micro-planning (orientation workshops for departments); Micro planning of health zones.

Integration of immunisation services into HCs without vaccination; increased immunisation sessions in fixed and advanced sites.

#### 4.1.2.Strengthening labour capacity

The introduction of the vaccine against rotavirus infections will be a perfect opportunity to train staff for the specific aspects of this vaccine. This training will take place at two levels: training of trainers and training of staff at operational level. The training will help to improve health workers’ skills at all levels and will cover the technical areas of vaccination service (characteristics of rotavirus vaccine, administration of this vaccine, stock management, maintenance of CDF equipment, safety of injections, AEFI, management and disposal of sharp waste, supervision, management of diarrhoea cases, etc.).

In order to strengthen staff capacity, the following activities will be undertaken:

* Prepare/adapt generic WHO training modules on the rotavirus vaccine in collaboration with partners (EPI and technical partners);
* Train approximately 24 trainers (two per department) in collaboration with technical partners (pool of trainers); These trainers will be used to train professional in health zones;
* Train management teams and nurse vaccinators from the 34 health zones;
* Train community stakeholders from 855 health areas.

Peripheral-level use of management tools such as vaccine loss monitoring sheets, wastage monitoring sheets, EPI data collection sheets (vaccine procedures, surveillance, AEFI) will be strengthened.

#### 4.1.3.Strengthening monitoring and assessment of the introduction process

The periodic evaluation of the introduction process will assist in identifying problems that may jeopardize the process of introducing the rotavirus vaccine into the routine vaccination system. Thematic working groups will be set up with specific terms of reference and checklists of preparatory activities. All EPI management tools will be revised to incorporate specific new vaccine information (rotavirus), printed, reproduced and distributed at all levels. These tools will include:

* Data collection and reporting forms (tally sheets, vaccination registers, monthly report cards, children’s vaccination cards, etc.);
* Different disease monitoring reports and AEFI;
* Programme resource management tools (registries for vaccine management and other forms, etc.);

All old tools will be removed and replaced with revised tools; all healthcare professionals will be trained to use new tools. The database will also be updated centrally.

For a better understanding of the use of services after the introduction of the new vaccine, the following actions will be implemented:

* Establish sub-working groups centrally for different areas where the rotavirus vaccine is introduced with terms of reference (cold chain and logistics, technology, social mobilisation and advocacy, surveillance);
* Develop a checklist with specific activities for each area to be monitored;
* Subgroups should meet monthly to monitor the implementation of the introduction process;
* Implement PIE recommendations for vaccines introduced in the past, including PCV13.
* Revise EPI management tools and update the EPI database by including rotavirus vaccine information.
* 6–12 months after the introduction of the rotavirus vaccine, an evaluation will be conducted.

**4.1.4. Building cold chain storage capacity**

Analysis and forecasting tools for storage capacities and physical inventories of cold chain equipment have shown that the storage capacity at the central depot is sufficient to accommodate both old and new vaccines. At the intermediate level, the Mono and Ouémé depots still have additional needs. The following activities may be offered:

* Purchase of a cold room for the Mono and Ouémé depots.
* Maintenance of cold chain equipment at all levels.

**4.1.5. Improving supply and management of vaccines**

The purchase of traditional vaccines and new and underused EPI vaccines by the government and partners will continue. Plan for gradually managing new vaccines by the State through a co-financing mechanism in line with the new GAVI policy is reflected in the multiannual plan 2015–2018. The stocking rate of the rotavirus vaccine will be integrated with the existing system which takes into account the approach to introducing this vaccine. Such stocking will be done centrally through the UNICEF procurement assistance system and vaccines will be released after release of batches based on a distribution plan developed for this purpose.

Estimated needs for this vaccine (anti-rotavirus) have been calculated using the logistical supply tool and the following parameters:

* Average growth rate of 3.2% of the population for previous year.
* Each target will receive two doses of Rotarix; this is a liquid vaccine in a one-dose vial.
* Wastage rate: 5% for vaccine.

Benin has used the target population method to estimate rotavirus vaccine requirements.

* Formula = Targetpop x Vcv x Ndose x Lossfac
* Targetpop = target population
* Vcv= vaccination coverage (objective)
* Ndose = number of doses
* Lossfac = loss factor

For the first year of introduction of the Rotarix vaccine (2018), estimated needs must take into account a reserve stock of 25%. With the current cMYP ending in 2018 (cMYP 2014-2018), current demand for support of the rotavirus vaccine cannot be extended beyond 2018 but can be renewed after revision of the cMYP (cMYP 2019–2023 and presentation of additional requirements for the four remaining years).

Benin will prepare an evaluation report for the first year of introduction and submit it to GAVI, together with the new cMYP and additional requirements for the remaining years.

Rotavirus requirements are summarised in the table below:

**Table 10:** *Estimated needs for rotavirus vaccines in Benin in 2018*

|  |  |  |  |
| --- | --- | --- | --- |
| ***Benin*** | ***Total population in 2018*** | ***Target population***  ***0–11 months*** | ***Number of rotavirus doses*** |
| Requirements for 6 months vaccination | 11,852,802 inhabitants | 253,482 | 532,320 doses |
| Safety stock (25%) |  |  | 133,080 doses |
| **Total** |  |  | **665,400 doses** |

To improve the supply and quality of vaccines (including the rotavirus vaccine), the following activities will be programmed:

* Correctly estimate rotavirus vaccine requirements for the first year (2018, beginning in February),
* Begin the preparation of a new cMYP and, at the same time, the progress report in the implementation of this plan,
* Prepare Rotarix vaccine requirements for the next four years to be submitted to GAVI to avoid vaccine stock shortage,
* Training of vaccine depot managers at all levels,
* Monitoring of stock and quality of vaccines (temperature, freezing, etc.),
* Monitoring of vaccine wastage.

#### 4.1.6. Strengthening advocacy, social mobilisation and communication for changing behaviour

The process of implementing the rotavirus introduction plan must be supported by effective communication. This is a new vaccine that requires the implementation of a communication plan that takes into account appropriate strategies. In this perspective, all previous experiences related to the introduction of new vaccines will be capitalised on and strengthened. This aspect of the EPI is crucial to retain parents’ interest, especially in a country like Benin where there is increasing evidence of reluctance following repeated vaccination campaigns.

Specific emphasis will be placed on interpersonal communication, which is a key strategy in reducing drop-out rates, especially since communication has been recognised by several assessments as a weak link in the EPI in Benin. Advocacy will be conducted with decision-makers and opinion leaders, health staff, and the general public (including parents) to gain their support and involvement in the monitoring of AEFI. Policy makers, EPI staff at all levels, medical staff of educational institutions, hospital staff and even the national media will need to be well informed about rotavirus and the side effects of the vaccine.

In view of the evidence and the situational analysis, to better achieve targets, the following activities have been proposed:

* Prepare a communication and awareness plan for populations and key stakeholders (parents of children, etc.) before the introduction of the vaccine.
* Conduct advocacy before decision-makers and influential people to support the rotavirus vaccine introduction project.

The planning document should include the following operations as a priority:

1. Strengthening a framework for exchanges between health workers, parents, communities and opinion leaders on vaccination.
2. Use of appropriate outreach channels to inform the population about vaccination and the rotavirus vaccine.
3. Use of tools provided by social networks/GSM and mass vaccination campaigns to inform and educate parents about the rotavirus vaccine.
4. Increased involvement of civil society organisations (CSO) and the private sector in vaccination activities.
5. Reinforcement of community advocacy capacity.
6. Research in the field of communication to improve dialogue between communities concerning vaccination.
7. The mobilisation of resources for EPI communication activities and for the introduction of the rotavirus vaccine at all levels of the healthcare pyramid (national, departmental and operational levels).

All such operations will help to address the lack of communication concerning vaccination. However, it is only by implementing and following up these strategies that individuals and communities will understand the value of vaccines, particularly the rotavirus vaccine.

#### 4.1.7. Strengthening monitoring of rotavirus and AEFI

**4.1.7.1. Improving monitoring of rotavirus infections**

Monitoring of rotavirus infections may be improved by considering the following activities:

* Improve monitoring of rotavirus infections (definition of cases, confirmation of cases and reporting).
* Train agents of monitoring and surveillance sites.
* Supervise rotavirus monitoring sites.
* Provision of lab kits.

##### 4.1.7.2. Monitoring of AEFI

To date, there is no data related to invaginations. It is important to initiate surveillance of invaginations, if possible before the introduction of the vaccine. To this end, the following activities may be offered:

* Train newly recruited providers on AEFI (including case definitions for invaginations) covering data collection, notification and investigation of AEFI.
* Put in place different guidelines and mediums for AEFI,
* Integrate AEFI supervision into other supervision and,
* Involve the community in AEFI monitoring through relays.

#### 4.1.8. Strengthening of coordination and integration of interventions

National coordination of operations is ensured by the ICC chaired by the Minister of Health. This decision-making body is made up of most EPI partners, the Ministry of Finance and the Budget as well as some Ministry of Health executives.

The ICC will be responsible for coordinating the activities of partners, and monitoring the process of introducing, validating and endorsing the application prior to submission to GAVI. In addition to the process of introducing the children’s AG vaccine, other aspects of integrating prevention, protection and management of childhood diarrhoea will be discussed within this body. The main activities will include:

* regular meetings for monitoring the proposal process;
* identification of prevention, protection and management activities in the context of combatting diarrhoeal diseases;
* validation and endorsement of the proposal as well as its submission to GAVI;
* If the proposal is approved, the ICC will follow the introduction preparation level.

#### 4.1.9. Financial sustainability

Benin is firmly committed to funding vaccine costs (purchase of traditional vaccines and co-financing of new vaccines). Advocacy must continue in order for this effort to be maintained.

#### 4.1.10. Operational research

Given the lack of basic data on invaginations, the country will conduct a retrospective or prospective study on the prevalence of invaginations in healthcare facilities.

### V. Timeframe of activities introducing RVV

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Fields / Activities** | **Agents** |  | **2016** | | | |  | **2017** | | | | | | | | | | |  | **2018** | | | | | |
|  | **A** | **S** | **O** | **N** | **D** | **J** | **F** | **M** | **A** | **M** | **J** | **J** | **A** | **S** | **O** | **N** | **D** |  | **J** | **F** | **M** | **A** | **M** | **J** |
| Develop a plan for introducing rotavirus vaccine | DNPEV,  partner of ICC and RAVIB |  |  | X | X | X | X |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Develop a proposal to support GAVI for rotavirus vaccine | DNPEV,  partner of ICC and RAVIB |  |  |  |  | X | X |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Submit the support request for the introduction of the rotavirus vaccine | ANV-SSP/MoH |  |  |  |  |  | X |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Lead the orientation workshop to guide healthcare zones in identifying needs for rotavirus vaccine | ANV-SSP/MS  with technical partners  (WHO/UNICEF) |  |  |  |  |  |  | X | X | X |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Organise microplanning of RVV introduction activities in healthcare zones to identify introduction needs | Healthcare zone agents |  |  |  |  |  |  |  |  |  | X | X | X |  |  |  |  |  |  |  |  |  |  |  |  |
| Prepare or adapt training modules | ANV-SSP/MoH and Partners |  |  |  |  |  |  |  | X | X |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Fields / Activities** | **Agents** |  | **2016** | | | | **2017** | | | | | | | | | | | | | **2018** | | | | | |
|  | **A** | **S** | **O** | **N** | **D** | **J** | **F** | **M** | **A** | **M** | **J** | **J** | **A** | **S** | **O** | **N** | **D** |  | **J** | **F** | **M** | **A** | **M** | **J** |
| Cascade training of central trainers, management teams of 34 zones,  nurses and community  relays | Central level trainers, healthcare zone managers |  |  |  |  |  |  |  |  |  |  |  |  | X |  |  | X | X | X |  |  |  |  |  |  |
| Establish sub-working groups for the different introduction areas with ToRs | ANV-SSP/MoH and  Partners (WHO,  UNICEF,  RAVIN) |  |  |  |  |  |  |  | X | X |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Develop a checklist for different areas to be monitored | ANV-SSP/MS and  Partners (WHO,  UNICEF,  RAVIN) |  |  |  |  |  |  |  | X | X | X |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Organise monthly monitoring meetings | Working groups |  |  |  |  |  |  |  |  | X | X | X | X | X | X | X | X | X | X | X |  |  |  |  |  |
| Implement PIE recommendations | ANV-SSP/MS &  Partners |  |  |  |  |  |  |  |  | X | X | X | X | X | X | X | X | X | X | X |  |  |  |  |  |
| Revise EPI management tools and the database, print and distribute them | Working groups |  |  |  |  |  |  |  |  | X | X | X | X |  |  |  |  |  |  |  |  |  |  |  |  |
| Conduct evaluation 6–12 months after introduction | ANV-SSP/MoH  & partners |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Acquire CDF equipment and set it up | ANV-SSP/MoH  Management |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Fields / Activities** | **Agents** |  | **2016** | | | | **2017** | | | | | | | | | | | | | **2018** | | | | | |
|  | **A** | **S** | **O** | **N** | **D** | **J** | **F** | **M** | **A** | **M** | **J** | **J** | **A** | **S** | **O** | **N** | **D** |  | **J** | **F** | **M** | **A** | **M** | **J** |
|  | Logistics |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Set up cold room in  Couffo/  Mono department | ANV-SSP/MoH  /Management  Logistics |  |  |  |  |  |  | X | X |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Preventive maintenance (training? maintenance monitoring?) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Correctly estimate rotavirus vaccine requirements during first year (2018) | ANV-SSP/MoH & Partners |  |  |  |  |  | X |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| During the same year, begin preparing the cMYP  and rotavirus vaccine user  report | ANV-SSP/MoH & Partners |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | X |
| Correctly estimate requirements for next four years | ANV-SSP/MoH & Partners |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | X |
| Train vaccine depot managers | ANV-SSP/MS &  Logistics |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | X |  |  |  |  |  |  |
| Regularly monitor vaccine stocks | Depot agents |  |  |  |  |  | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| Regularly monitor vaccine wastage | Depot agents |  |  |  |  |  | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| Monitor vaccine losses | Depot agents |  |  |  |  |  | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Fields / Activities** | **Agents** |  | **2016** | | | | **2017** | | | | | | | | | | | | | **2018** | | | | | |
|  | **A** | **S** | **O** | **N** | **D** | **J** | **F** | **M** | **A** | **M** | **J** | **J** | **A** | **S** | **O** | **N** | **D** |  | **J** | **F** | **M** | **A** | **M** | **J** |
| Conduct advocacy sessions? | Moso working groups |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Prepare key messages which take into account parents’ concerns | Moso working group |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | X | X | X |  |  |  |  |  |  |
| Collaborate with the media in the context of introducing rotavirus vaccine (TV, radio, etc.)? | Moso working group |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Design and print IEC materials? | Moso working group |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Organise the vaccine launch ceremony | Moso working group |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | X |  |  |  |  |
| Improve monitoring of rotavirus infections (definition of cases,  confirmation and reporting of cases); | Working group  Surveillance and  WHO |  |  |  |  |  |  | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| Introduce monitoring of invaginations before or upon the introduction of  rotavirus vaccine | Working group  Surveillance and  WHO |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | X | X | X |  |  |  |
| **Fields / Activities** | **Agents** |  |  | **2016** |  | | **2017** | | | | | | | | | | | | | **2018** | | | | | |
|  | **A** | **S** | **O** | **N** | **D** | **J** | **F** | **M** | **A** | **M** | **J** | **J** | **A** | **S** | **O** | **N** | **D** |  | **J** | **F** | **M** | **A** | **M** | **J** |
| Strengthen inter-agency coordination (regular meetings, programme monitoring, information exchange) | ANV-SSP/MoH |  |  |  |  |  |  | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| Conduct operational research (retrospective or prospective study) and invagination cases | ANV-SSP/MoH & Partners |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | X | X | X | X | X |
| Collaborate with other healthcare sectors to integrate other operations to combat diarrhoea (protection and case management) | ANV-SSP/MoH and paediatric services |  |  |  |  |  |  | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |

### VI. BUDGET FOR INTRODUCINT ROTAVIRUS VACCINE

See budget attached

1. Population projection based upon GPPH-4, INSAE data, January 2002. [↑](#footnote-ref-1)
2. Income classification by country, International Monetary Fund, Nominal GDP by country 2014 [↑](#footnote-ref-2)
3. http // www.journaldunet.com [↑](#footnote-ref-3)
4. Parashar UD, Gibson CJ, Bresee JS, Glass RI: Rotavirus and severe childhood diarrhoea. Emerg Infect Dis 2006; 12/2:304-306. [↑](#footnote-ref-4)
5. External EPI 2014 review. [↑](#footnote-ref-5)
6. External EPI 2014 review. [↑](#footnote-ref-6)