Republic of Senegal

One People - One Goal - One Faith

MINISTRY OF PUBLIC HEALTH AND PREVENTION

DEPARTMENT OF MEDICAL PREVENTION

EPI Comprehensive Multiyear Plan 2012-2016

Complete Multi-Year EPI Plan

2012-2016

Preface

In Senegal, as in other Sub-Saharan countries in Africa, vaccine preventable diseases are the leading cause of mortality for children under 5. Senegal's vaccination policy is derived from the National Health Development Plan (NHDP) which itself is based on strategies proposed in the Economic and Social Policy Document (DPES), representing a unique framework for action by all participants in Senegal's development.

Since 2001, the Expanded Program for Immunisation in Senegal has been a dynamic and effective program tackling 9 diseases. In 2004, Senegal introduced into the routine EPI the Hepatitis B vaccine, and in 2005, introduced the pentavalent vaccine against HIB. DTC3 coverage (penta3 since 2005) went from 45% in 2001 to 87% in 2009; for the measles vaccine, coverage when from 42% in 2001 to 80% in 2009. Senegal was declared free from the circulation of the indigenous wild Polio virus in 2004. Since 2004, there have been no cases of death from measles reported; in contrast, the country reported more than 1,000 cases in 2001. In 2009, all the districts reached their goal of less than one case of Neonatal Tetanus per 1,000 live births, making progress toward eradicating MNT in Senegal. All the districts organised follow-up and preventive campaigns against yellow fever between 2002 and 2007. The incidences of bacterial Hib meningitis in infants less than 1 year old dropped from 21.5 cases per 100,000 in 2003 to 1.4 cases per 100,000 in 2007, following the introduction of the vaccine in 2005.

For the period 20012-2016 in the current multi-year plan, the objectives predict a contribution to the reduction of infant and juvenile mortality and the improvement of maternal health by vaccination and by surveillance of targeted EPI diseases and potentially epidemic diseases. This multi-year plan report was drafted based on a strong situational analysis, with a particular emphasis placed efficient vaccine management in 2009, a logistical inventory and an external review in 2010. This situational analysis has allowed EPI performance to be summarized and to formulate relevant recommendations so it can be improved. This plan establishes priorities, develops strategies, determines the main activities involved, and evaluates the costs as well as the sources of financing for the 2012 to 2016 period. This plan is notable for its introduction of 2 new vaccines, the pneumococcus vaccine in 2012 and the rotavirus vaccine in 2013. Also, a vaccination campaign against meningitis is planned, using the XXX [sic] vaccine. The cost of the EPI for the period from 2012 to 2016 is $207,012,833 (CFAF 96,407,946,456) and it is 99% funded if the country of Senegal covers its responsibilities and if its partners confirm their intentions (assured and likely funding).

This plan is the outcome of participation among all those involved in the vaccination field in Senegal. The Ministry of Health and Prevention considers it the national document of reference and recommends it be adopted by all participants to encourage a greater synergy of action for the implementation of diverse projects, programs and other approaches.

The Ministry of Health and Prevention

Modou DIAGNE FADA

LIST OF ABBREVIATIONS

NRA	Autorité Nationale de Réglementation [National Regulatory Authority]
BCG	Bacille de Calmette et Guérin (immunisation against tuberculosis)
CIB	Consolidated Investment Budget
BRISE	Bureau Régional de L'immunisation et de la Surveillance Epidémiologique [Regional Office for Immunisation and Epidemiological Monitoring]
BS	Sharps Box
CASES	Communication for Changing Behaviour
ICC	Inter-Agency Co-ordination Committee
CC	Cold Chain
CDT	Medium-Term Expenditure Framework
MTEF	Medium-Term Expenditure Framework (MTEF)
IPC	interpersonal Communication
CNCPEV	Comité National de Coordination du Programme Elargi de Vaccination [National Committee for Coordinating the Program in Expanded Immunisation]
PNC	Prenatal Consultation
VC	Vaccination Coverage
DGAE	Department of General Administration and Equipment
DANSE	Division de l'Alimentation, de la Nutrition et de la Survie de l'enfant [Food, Nutrition and Infant Survival Division]
ID	Immunisation Division
DPES	Economic and Social Policy Document
DPL	Direction de La Pharmacie et des Laboratoires [Pharmacy and Laboratories Department]
DPM	Direction de la Prévention Médicale [Medical Prevention Department]
DPS	Department of Planning and Statistics
DREAT	Delegation for Reform of the State and Technical Assistance
HD	Direction de la Santé [Health Department]
DSE	Division de la Surveillance Epidémiologique [Epidemiological Monitoring Division]
PRSP:	Each District Approach
DTP	Diphtérie Tétanos Coqueluche (immunisation against diphtheria, tetanus and pertussis)
DMT	District Management Team
RMT	Equipe Cadre de District [Regional Management Team]
EDS	Enquête Démographique et de Santé [Demographic and Health Survey]
ESIS	Enquête Sénégalaise sur les Indicateurs de Santé [Senegal Health Indicators Survey]
GAVI	Global Alliance for Vaccines and Immunisation
GIVS	Global immunization: vision and strategies
IEC	Information Education Communication
NMD	National Micronutrient Days
NVD	National Vaccination Days
JSE	Days of child's survival
LUXDEV	Luxembourg Agency for Development Cooperation
APVS	Manifestations Adverse Post Immunisation [Adverse Post-Immunisation Symptoms]
MCA	Millenium Challenge Account
MCD	Senior District Physician
MCR	Senior District Physician
MII	Promotion of sprayed mosquito nets:
MLM	Mid Level Management
OCB	Organisation Communautaire de Base [Basic Community Organisation]

MDG	Millennium Development Objectives
WHO	World Health Organization
NGO	Nongovernmental Organization
PC	Complete package
IPT	Prise en Charge Intégrée des Maladies de l'enfant [All-inclusive Child Disease Care]
VVM	Vaccine Vial Monitor
PDV	No longer tracked
EPI	Expanded Program on Immunisation
AFP	Paralysie Flasque Aigue [Acute Flaccid Paralysis]
PM	Minimum package
PNA	Pharmacie Nationale d'Approvisionnement [National Provisioning Pharmacy]
MISPCL	Plan Départemental de Développement Sanitaire [National Health Development Plan]
PNLP	National Program to Combat Malaria
PNT	National Program to Combat Tuberculosis
PPS	Point de Prestation de Services [Services Delivery Point]
HIPC	Highly Indebted Poor Countries
PRA	Pharmacie Nationale d'Approvisionnement [Regional Provisioning Pharmacy]
PRONALIN	Programme National de Lutte Contre les Infections Nosocomiales [National Program to Combat Nosocomial Infections]
PTA	Annual work plan
WPV	Wild Polio Virus
RED	Reach Every District
NRA	National Regulatory Authority
HSS	Health system reinforcement
ADS	Seringue Autobloquante [AD (non-reusable) Syringe]
SASDE	Stratégie Accélérée pour la Survie et le Développement de L'enfant [Accelerated Strategy for Child Survival and Development]
SD	Seringue de dilution [Dilution Syringe]
IDRM	Integrated Disease Surveillance and Response
SNEIPS	National Health Education and Information Service
TNM	Neonatal and Maternal Tetanus
TPIn	Intermittent Preventive Treatment for Infants
TT	Toxine Tétanique [Tetanic Toxoid]
UNICEF	UNICEF : United Nations Children's Fund
USAID	United States Agency for International Development
YFV	Vaccin Anti Amaril (against Yellow Fever)
MV	Vaccin Anti Rougeoleux [Measles Vaccine]
VAT	Vaccin Antitétanique [Anti-Tetanus Vaccine]
OPV	Oral Polio Vaccine
VVM	Vaccine vial monitor

List of Tables

List of Figures

SUMMARY:

I INTRODUCTION

Vaccinations have occupied a very important place in Senegal's national health policy since the adoption of primary health services with the integration of expandecd program for immunisation (EPI) for vaccine preventable diseases.

Senegal became involved in 2000 with relaunching EPI following a difficult period marked by reduced immunisation coverage and the resurgence of diseases such as measles. Following the EPI review of 2000 and the creation of the strategic plans for 2001-2005 and 2007-2011, a certain number of actions and measures were taken, including:

- Strengthening the Program's coordination at the central level by creating the Immunisation Division that is housed within the Department of Medical Prevention;
- Creation of a national coordination committee for EPI (called "ICC") that regroups the Ministry of Health and its partners;
- Inclusion of, and increases to, a budget line item devoted to the purchase of vaccines and supplies which has improved vaccine availability;
- Improvements to logistics on wheels and the cold chain;
- Strengthening health care personnel management capacities at all levels;
- Strengthening vaccination-related activities and injection safety, with GAVI's support;
- Regular monitoring of EPI progress.

This commitment has translated into clearly improved management of the program at all levels, even though there are still challenges left to be overcome. The following results may be emphasized:

- An increase in and stabilization of immunisation coverage
- Efficient and competent management of all immunisations at all levels
- An efficient system of surveillance and immunisation safety
- Allocation of adequate financial resources along with access to them so as to ensure ongoing funding for the national immunisation program.

The majority of constraints and obstacles preventing desired results with regard to immunisations are linked to the health system. Strengthening this system is crucial to guaranteeing long-term success for EPI.
In 2010, an external review of EPI was implemented, at the request of the Ministry of Health, due to a noticeable drop in the program's successes after 2008.
The main conclusions and recommendations of this external review have been integrated into the CYMP.

In April 2005, the 58th World Health Assembly adopted a project called "Immunising the World: Vision and Strategy" with resolution WHA 53.12 which recognizes immunisations as an important factor in promoting health among children. This new vision for immunisation throughout the world (GIVS) is fully in line with the strategy to reduce poverty, one crucial part of which is the health component. Additional resources taken from the PPTE initiative will be focused on targeting the most vulnerable groups to attain OMDs.

The implementation of the health policy has allowed for significant advances such as the reduction of the infant-juvenile mortality rate, which decreased from 139% to 121% between EDS III (1997) and EDS IV (2005). The EPI has strongly contributed to this reduction which was affected by the implementation of accelerated strategies, combating, in particular, diseases such as polio, measles, and also by the introduction of new vaccines (Hepatitis B and Hib).

The current strategic EPI plan and monitoring, which takes the position outlined above, shows the solidifying of a national political will and partner participation. It defines the major axes of intervention for the 2012-2016 time period so as to leverage synergy with other maternal and child health programs targeted at significantly reducing the morbidity levels and mortality linked to preventable diseases through immunisation, improved health and improved quality of life for the population in general.

II CONTEXT

II.1 GENERALITIES

Located in the western region of the African continent (between 12.5 et 16.5 degrees latitude north), Senegal covers 196,722 km², bordered to the north by Mauritania, to the east by Mali, to the south by Guinea as well as Guinea Bissau. The country is divided into regions, 45 departments, 121 arrondissments, 113 communes, 46 arrondissement communes and 370 rural communities containing villages. It has a Sudano-Sahelian climate, with a dry season extending From November to June and a rainy season From June to October. The annual rainfall exceeds 300 mm in the north of the country, which is semi-desert, and 1200 mm in the south. The 2011 population is estimated at 12,862,587 with an annual growth rate of 2.7 % (RGPH 2002). The birth rate is 39% (EDS IV) and the synthetic fertility rate index is estimated at 5.3 children per woman. Senegal has the highest urbanisation rate in black Africa (DPS 2005). The population is young with around 50% being younger than 16 years old. Children age 0 to 5 represent 19.4% of the total population.

Poverty is considered in Senegal to be related to the lack of income, food, clothing, decent housing, and access to education, healthcare and potable water. The empirical approach for this definition of poverty translates to a basket of food and non-food goods that are indispensable to each individual, or group of individuals, so that they may exist in decent conditions. The level of poverty, therefore, indicates the proportion of individuals who do not have access to this defined minimum basket.

According to the results of the study on poverty, Chronicle 16, in 2008-2009, the poverty profile in Senegal revealed that 6 out of 10 individuals are either considered to be living in poverty or vulnerable. Out of the 6 individuals who are classified as living at the poverty level, 4 are poor and 2 are vulnerable to a shock (economic, health and ecological) which can rapidly cause them to descend into poverty. In Senegal, 54% of those living in poverty reside in rural areas, 29% in Dakar and its surrounding areas, and 17% are found in other cities. The conditions leading to vulnerability are especially present in rural areas where 94% of those considered vulnerable reside, in contrast to the only 4% found in other cities, and the 2% found in Dakar. The principal health indicators of EDS IV, noted in 2005, show that progress has been made but that child and maternal health remains a primary concern.

- Maternal mortality rate: 434 per 100,000 live births (309 in the urban areas versus 472 in the rural areas)

- Infant mortality rate: 61% (52 in the urban areas versus 82 in rural areas);
- Rate of infant and juvenile mortality: 121% (91 in the urban areas versus 160 in the rural areas)

It emerges From these indicators that the rural areas, which are poor and often isolated, pay the heaviest tribute in morbidity and mortality among the groups that are the most vulnerable, women and infants.

II. 2 HEALTH DOCUMENTS AND POLICIES

II.2.1 DPES 2011-2015

Toward the goal of inclusiveness, the country of Senegal has, since the middle of the 1990s, implemented policies, strategies and programs that have a common and fundamental objective to efficiently combat poverty and encourage an economic resurgence. The decade of the 2000s—and in particular, since the year 2003—has been marked by implementation of the Poverty Reduction Strategy Document [Document de Stratégie de Réduction de la Pauvreté] (DSRP-I, 2003-2005), which was reactivated in 2006 to apply to the 2006-2010 period (DSRP-II). The DSRP serves as a framework and reference with regard to economic and social policy, as well as for growth and the reduction of poverty within the general context of the pursuit of the Millennium Development Goals (MDG).

For the five-year period from 2011-2015, all participants have agreed on the necessity of defining a national strategy that is marked by both realism and innovation: the Economic and Social Policy Document [Document de Politique Economique et Sociale - (DPES)]. The current strategy, a unique interventionist approach involving all development participants, subscribes to a long-term vision that is against social exclusion and which calls upon the policies of the central and local governments to be engaged in the medium-term goal of accomplishing the MDGs by 2015. This document also serves as a reference point for Senegal's social and economic policy and analyses the fundamental situation using the diagnostic report DSRP-II. This document defines vision and strategic orientation and the most important action items, as well as describing the mechanisms by which the document's goals will be implemented.

The sub-sector of healthcare experienced positive results between 2006 and 2007. However, certain indicators fluctuated negatively, specifically those related to the MDGs. Therefore, to better address maternal and child health issues and the fight against the most threatening diseases, the following goals and policies have been targeted for the 2011- 2015 period so as to ensure success within the health care services sector:

- Reduce the rate of maternal and infant-juvenile morbidity and mortality through actions and measures that encourage childbirth in healthcare centres staffed by qualified personnel, along with increased attendance at postnatal visits, and promotion of childhood survival through vaccination and better nutrition;
- Increase healthcare sector's success with regard to the prevention and the combat of the most deadly diseases by encouraging screening and strengthening the system of medical monitoring;
- Long-term strengthening of the healthcare system by ensuring the maintenance and replacement of equipment as well as improved quality of care;
- Strengthening of governmental oversight over the healthcare sector by ensuring efficiency as well as appropriate healthcare-related purchases along with more financial involvement in health matters at the locale (collective) level, and through developing a community-based approach and cross-sector partnerships.

II.2.2 PNDS 2009-2018

The items described in the DPES below from the DSRPII have served as the basis for defining the 2009-2018 National Health Development Plan [Plan National de Développement Sanitaire]. This Plan is founded on a vision of Senegal where all individuals, all households, and all collectives benefit from universal access to high-quality educational, preventive, curative and rehabilitative health services, without exclusion and where all are guaranteed a productive level of economic and social health. This plan targets the attainment of national and international objectives with regard to healthcare, and, in particular, the DPES and OMG goals.

Intervention strategies for the next ten years will be specifically focused on attaining the well-being of Senegalese families by improving the quality of services offered. This major focus will be achieved through a health system accessible to all, with local collectives and representatives who will be responsible and accountable, an organized population which participates and monitors, and technical and financial partners who are in tune with national priorities. The guiding principles for the implementation of PNDS 2009-2018 are participation, cross-sector partnerships, transparency, solidarity, equity and gender.

The strategic orientation for PNDS II is described in the following points:

- Acceleration of the struggle against maternal, neonatal, and infant mortality and morbidity
- Improvement of health education
- Better disease treatment
- Increased integrated surveillance and combat of diseases as well as follow-up care
- Development of human resources
- Strengthening of Infrastructures, Equipment and Maintenance,
- Increased availability of medication and medi-surgical products,
- Strengthening the system of information and research within the healthcare system
- Promotion of results-oriented management,
- Strengthening the sector's capacities with regard to administrative and financial planning management,
- Reinforcement of disease risk coverage with emphasis on vulnerable groups
- Integration of new vaccines.

II.2.3 NATIONAL IMMUNISATION POLICY

The focus of the CMYP informs that of the PNDS. The EPI, begun in Senegal in 1979, envisages using vaccination for the reduction of morbidity and mortality connected to preventable target diseases. Routine vaccination has been made a fixed strategy, both advanced and mobile; all the antigens are to be administered to infants before their first birthday as well as pregnant women.

With the introduction of the pentavalent vaccine in 2005, nine antigens are offered through the EPI in all the country's localities. Particular attention is paid to the how vaccines are preserved, to the safety of the injections by using one-time injection material, and to the management of solid human waste. The major strategic directions of EPI are:

- Strengthening the immunisation system;
- Improvement of management capacities at all levels;
- Sufficient supplies of high-quality vaccines;
- Maintenance and updating of logistics;
- Reinforcement of communication and social mobilisation for EPI;
- Adequate and long-term financing for EPI.

II.2.2 THE HEALTHCARE SYSTEM

1.3.1 System organisation

Senegal's healthcare system is organized into a pyramid-style structure with three levels: the central and intermediate levels are made up of Medical and Outlying Regions called health districts. The State envisages a reform of the healthcare system and the work to develop that has been assigned to the DREAT, which is currently being finalized.

Central level

In addition to the Ministry, the central level includes the Secretary General and related Departments and Services. Three specific issues cause difficulties within the way services function at the institutional level: (i) the large number of services included, (ii) the overlapping responsibilities of central services sharing the same mission, (iii) the lack of precision in missions due to the absence of directives for implementation.

Intermediary level: Medical Region (MR)

Senegal has 14 medical regions. Medical regions, which correspond in coverage area to that of the country's administrative regions, ensure coordination, supervision, and inspection and monitoring of the public and private healthcare structures within the region. The medical regions organize technical cooperation between all regional healthcare entities and assist them in their administrative, management and planning tasks. Yet, the Medical Regions have difficulties playing this role due to insufficient capacity, human resource and logistical issues.

Peripheral level: Health District (HD)

Senegal has 75 health districts which provide a healthcare unit that near to the population. The district is the operational unit at the outermost boundaries of the healthcare pyramid. At this level, medicine is practiced in four-dimensional fashion: curative, preventive, social and educational. The district is made up of one or more health centres and encompasses a network of healthcare stations which, in turn, supervise healthcare needs and rural pregnancies. The districts, as with the medical regions, lack capacity. This situation explains the weakness of the executive teams.

II.2.2.2 Health System Strengthening

Strengthening the healthcare system in Senegal means increasing the use of healthcare services, as well as increasing the number of quality services offered, including immunisations. This is in line with reaching the goals needed to implement the second phase of the National Health Development Plan [Programme National de Développement Sanitaire - PNDS] - 2004-2008, the Midterm Sector Expenditures (FMSE) [Cadre de Dépenses Sectorielles à Moyen Terme – CDSMT] - 2008-2010, and the strategic plan for child monitoring strategy (2008-2015). The HSS goal is to reinforce the healthcare system's capacities so as to improve mother and child healthcare program success. The principle objectives targeted by strengthening the system are:

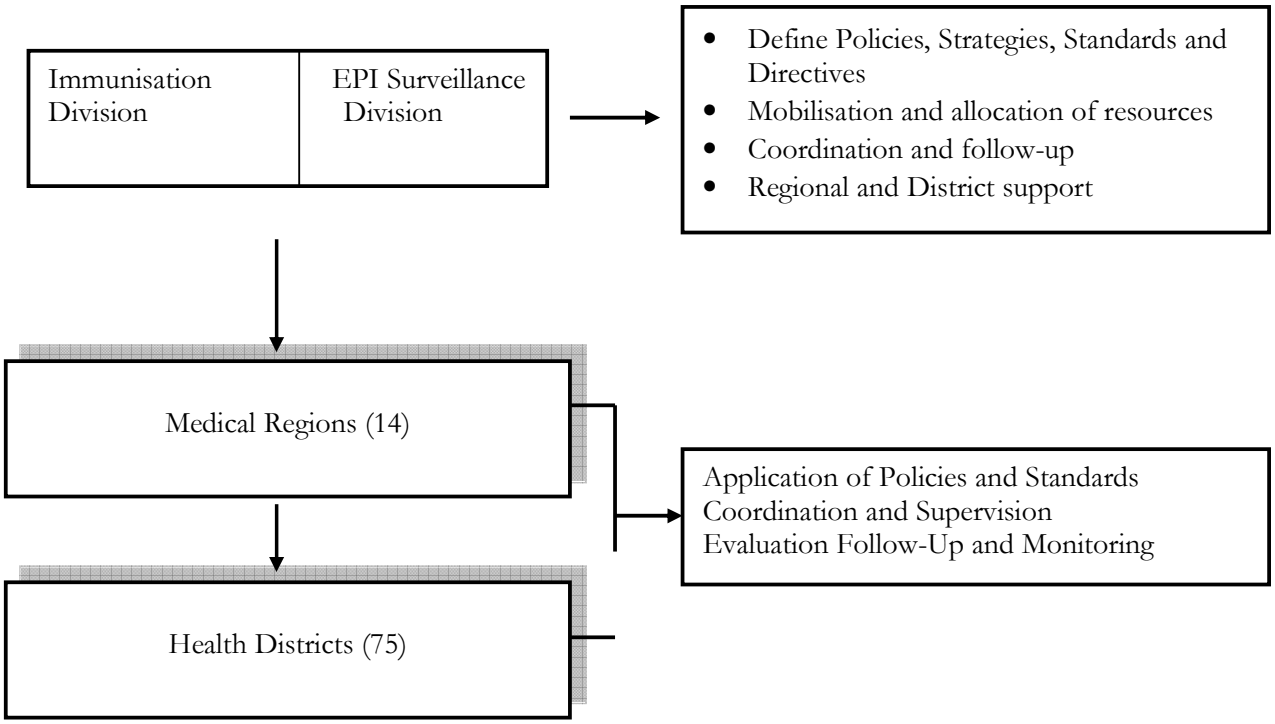
1. Reinforce health agents' expertise of program management as it applies to maternal, infant and child health
2. Increase district operational capacity
3. Improve the follow-up/evaluation system applied to healthcare programs

III SITUATION ANALYSIS

III.1 PROGRAM ORGANISATION AND MANAGEMENT

On the institutional level, EPI organisation and management have profited from the restructuring of the Ministry of Health in 2005, including the creation of a Department for Medical Prevention, which houses the Division of Immunisation and the Division of Epidemiological Surveillance. This restructuring has been accompanied by reinforcement of human resources centrally; it has allowed significant improvement of program management. However, the program still lacks independence, and, in particular, financial independence.

Figure 1: DPM organizational chart and location of EPI



III.1.1 Planning

The country has defined a complete multi-year plan for EPI for 2007/2011 with scheduled annual updates. In 2010, 83% of the districts visited for the review had an annual work plan (AWP) for immunisation activities.

III.1.2 Coordination

The coordination of immunisation activities is performed at all levels:

- The ICC meeting is planned to bring all partners together, and is presided over by the Ministry of Health, and scheduled quarterly. The purpose of this meeting is to validate the decisions proposed by the technical ICC and ensure that resources are mobilized. However, the ICC does not actually meet regularly.
- The technical ICC that brings together technical partners and DPM staff does meet regularly. It also does not include all the involved parties.
- The various status, monitoring and coordination meetings at the regional medical and district levels are not held on a regular basis

III.1.3 Supervision

Supervisory meetings are to be scheduled every six months at the central level to oversee the regions, as well as similar meetings for the regions to oversee the districts to be scheduled every three 3 months, and the districts to oversee the healthcare stations, to be scheduled every month. However, these meetings do not regularly take place.

In 92% of the districts, a supervisory grid was available. Only 42% of the districts visited had a supervisory plan for 2010.

Supervision that takes place is not always documented. Written feedback to healthcare stations was only found in 17% of the districts visited and supervisory logs at healthcare stations were rarely found.

III.2 PROVISION AND CONSERVATION OF VACCINES AND SUPPLIES

III.2.1 Estimates of vaccines and supplies needed

Since 2001 a plan for providing vaccines and supplies has been defined every year so that vaccines are always available at the central and intermediate levels. The standard procedures for receiving vaccinations and supplies, and for transport from air and sea to the central warehouse, are generally respected.

The method of estimating vaccine needs is based on the target population at each level. Due to incorrect forecasts, certain districts and vaccinations units adjust their forecasted needs using past consumption.

How the supply chain works at each level is as follows:

- The central level is supplied every 6 months
- The regional level is supplied every 6 months
- The district level is supplied every 2 months
- The health stations are supplied every month.

Due to weak storage capacity, certain regions and districts may increase their supply frequency.

Important progress has been made in maintaining vaccine supply levels for the central, regional, and district levels. Vaccine availability rates at all levels have clearly improved. Except for the interruption in access to antigens noted in 2009 after 2008 supply chain non-mobilization for immunisations and supplies, the country's supply has been regularly maintained. In 2010, the line was fully available as of the first quarter and no interruptions occurred.

III.2.2 Conservation of vaccines

Those responsible for the vaccines preserve them in accordance with WHO recommendations. However, as at the central level, capacity needs to be strengthened, in

particular with regard to the condition of ice packs when distribution and vaccine agitation tests are taking place.

The cold rooms are not equipped with a system that automatically records temperature, and, as a result, recordings are taken manually.

At the district and regional warehouse levels, only 50% of those who are responsible for doing so perform a manual check of the twice-a-day manual temperature check, and the archiving of records needs to be improved (external review 2010). The majority of stations perform daily manual temperature checks which are not systematically archived. These records are practically never reviewed at the end of the month to evaluate the quality of the inventory. A monthly physical inventory of vaccines and supplies is rarely performed and/or documented.

Currently, according to national regulation, it is forbidden to freeze vaccinations at the peripheral or intermediary levels, no matter how they were conserved elsewhere. The implementation of automatic temperature recording for all warehouses throughout the country has been scheduled to take place before the end of 2011.

III.2.3 Use of the vaccines

As shown in Figure 2, there has been a steady decrease in the vaccine loss rate since 2001. The vaccine loss rates have been well controlled for liquid vaccines (less than 10%) and acceptable for vaccines (<25%).

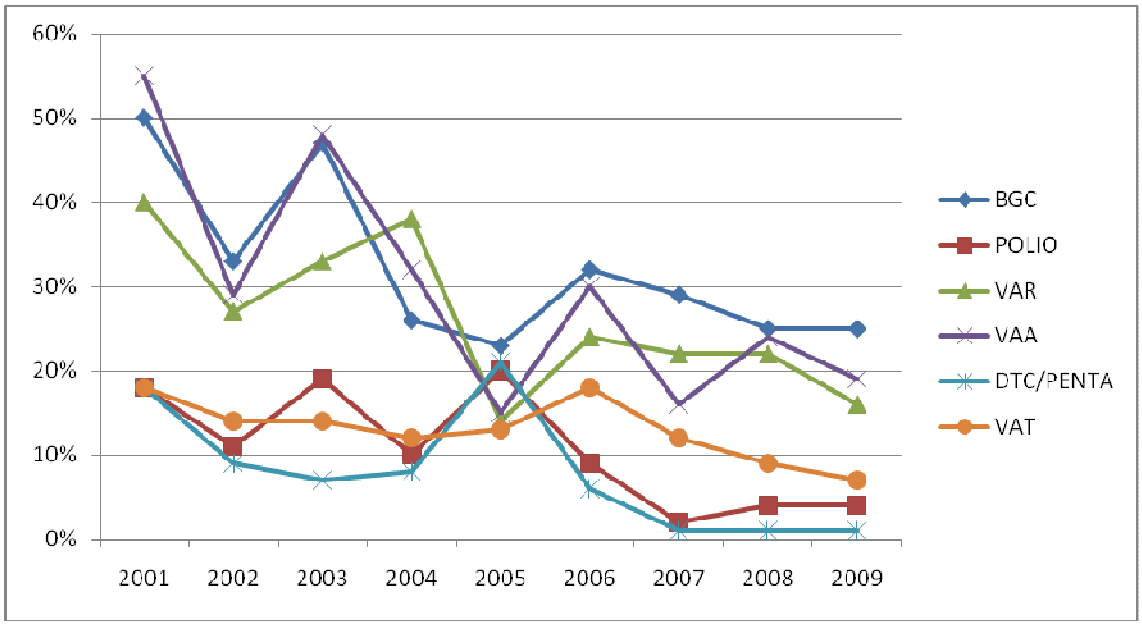


Figure 2: Change in loss rate for antigens from 2001 to 2009

III.2 COLD CHAIN LOGISTICS AND TRANSPORT

III.2.1 Cold Chain

At the central level, three positive cold rooms with a net total capacity of 31.25 m^3 and one negative room with 6.25 m^3 are available. All cold rooms are equipped with two cold generators as required. There is a backup generator group of 107 KVA. With the introduction of the pneumonia vaccine, the requirement at the central level will be 35.9 m^3 positive. With the introduction of the rotavirus vaccine in 2013, the requirement at the central level will be 48.8 m^3 positive. The gap will be 4.67 m^3 in 2012, 17.56 m^3 in 2013, and 21.6 m^3 in 2016. The rehabilitation plan is scheduled to implement three cold rooms of 12,5 m^3 net capacity each.

At the regional level, the implementation of 17 TCW 3000 refrigerators in 2010 allowed for requirements to be met through 2016.

At the district level, there is need over the next five years for 79 TCW 3000 refrigerators if the replacement of amortized equipment is addressed. However, there are 13 districts which do not have access to functional CDF equipment. This gap could largely be taken care of with the acquisitions forecast in the HSS and by UNICEF (13 TCW 2000) in 2011.

- At the vaccination unit level, after the acquisition of 350 RCW50 refrigerators in 2011, through the support of various partners (LUXDEV, UNICEF, GAVI), inventory capacity will be sufficient through 2016. However, it must be noted that progressive replacement of amortized refrigerators (638 of them) must take place between 2011 and 2016

Table I: Estimate of storage capacity needs for 2012 to 2013 at central level

APPENDIX	Required capacity		Available capacity		Additional capacity	
	+2°C to +8°C	-20°C	+2°C to +8°C	-20°C	+2°C to +8°C	-20°C
2012 + Pneumonia	35,924	3,422	31,250	6,250	4,674	-2,828
2013 + Rota	48,817	3,525	31,250	6,250	17,567	-2,725
2014	50,135	3,620	31,250	6,250	18,885	-2,630
2015	51,489	3,718	31,250	6,250	20,239	-2,532
2016	52,879	3,818	31,250	6,250	21,629	-2,432

III.2. 2 Logistics on wheels

The DPM has 5 vehicles available, 4 of which are more than five years old. The transport of vaccines and supplies was ensured by DPM which rented trucks for this purpose. Since January 2011, an agreement links DPM and PNA, which is now charged with the transport of vaccines and supplies from the national level to the regions. The 2010 inventory showed that 28 districts did not have access to a vehicle and that 700 vaccination units were without motorcycles. In 2011, 24 vehicles and 160 motorcycles were acquired through partner support (UNICEF 10 vehicles and 100 motorcycles, GAVI HSS 2 vehicles and 60 motorcycles, Luxdev 12 vehicles), which contributed toward reducing the gap.

III.3 COMMUNICATION

A strategic EPI communication plan was drafted for 2003-2008; tools for integrating vaccinations were developed to communicate information about child health: displays, advice cards, aide mémoire, etc.

There are social mobilization committees at all levels with good vaccination participation from the public. However, some areas that need improvement have been noted:

- Lack of human resources and equipment at the DPM's Communication Bureau
- Unsatisfactory collaboration between DPM and SNEIPS
- Unsatisfactory support and other communication materials for the routine EPI
- Social mobilization for special events, specifically mass vaccination campaigns, to the detriment of routine vaccinations
- Weakness in the evaluation of communication activities for the EPI

However, there does exist a dense network of basic community organisations (BCO) and contacts that promote health promotional activities by interpersonal communication and by social mobilisation. In addition, public, private, and community radio stations are well distributed throughout the entire country.

The introduction of the pentavalent vaccine was an opportunity which enabled communication plans to be revised and to conduct communication activities promoting the EPI intensively throughout the entire country.

III.4 REINFORCEMENT OF QUALIFICATIONS

III.4.1 Initial training

Instructors at the Faculty of Medicine and at the National School of Health Development have received training in EPI with the goal of integrating it into the initial training of doctors, nurses, and midwives. However, the introduction of the EPI into the curricula has not yet taken place. This is why within the HSS there is support for training instructors and those graduating from training schools.

There is a national training centre that offers courses in hospital maintenance and which trains advanced technicians. Including maintenance of CDF and EPI equipment in their curricula will allow it to become a focus of the program.

III.4.2 Continuing education

The national EPI guide, which provides clear information about the way in which immunisation activities must be conducted throughout the country was developed at the national level and made available to the healthcare districts. This guide is currently being updated and will take into account new information about the introduction of new vaccines.

According to the external review of 2010, 58% of district service providers visited had benefited from formal EPI routine training during the last three years, and 17% of the MCDs from management training.

III.5 PROVIDING SERVICES

Routine vaccination at the point of service delivery is done via fixed, advanced, and mobile strategies. The hepatitis B vaccine was included in the EPI in 2004 and the vaccine against hæmophilus influenzae type B (Hib), in July 2005. The current immunisation schedule is set out in Table 2. There is no national directive about catch-up activities for children aged more than one year. This activity is the responsibility of the healthcare districts.

The country has organised several mass campaign against polio, yellow fever, tetanus, measles and meningitis (cf chapter III.12.2).

Table II: Vaccination timetable in effect in Senegal

Infants 0-11 months	**Vaccines**
• Birth	BCG, VPO 0
• 6 weeks	Pentavalent1, VPO1
• 10 weeks	Pentavalent 2, VPO2
• 14 weeks	Pentavalent 3, VPO3
• 9-11 months	Measles, yellow fever
Pregnant women	VAT
• At first contact	VAT1
• 4 weeks later	VAT2
• 6 months later	VAT3
• 12 months later	VAT4
• 12 months	VAT5

The external review made the following observations possible:

- All the units vaccinate dependably at least one time per month, but advanced and mobile strategies are implemented in only 33% of the districts visited.
- Cartography exists in the majority of the healthcare districts, however, zones that are difficult to access only show up in 33% of cases.
- Specific plans to reach populations in difficult-to-access areas do not exist in 17% of the districts visited.
- An up-to-date self-monitoring performance curve was found in 36% of the units visited.
- A plan to locate those who slipped through the cracks (PDV) involving the community exists in most of the districts visited, even if no evaluations of these plans are available.
- Direct observations have shown good organisation of immunisation sessions at the stations visited. Some areas that need improvement have been noted at certain units (recapping needles, errors in record keeping, needle cutting, running out of vaccine during sessions, etc.).
- Lack of inter-personnel communication (IPC) during vaccination sessions has also been noted in all observations.

III.6 SAFETY OF INJECTIONS

The external review showed mastery of the vaccination technique by healthcare agents and also showed the use of vaccines with manufactures' diluents. The exclusive use of SAB and sharps boxes has been systematic since 2004. There has never been an issue with getting access to these products.

The national directives about disposal of sharps boxes are clear. All boxes must be incinerated according to a plan drafted at district level. Management of the sharps boxes is well-documented according to the records included with the monthly reports. During the mass campaigns, local companies and hospitals which have large capacity are called upon to help with sharps box incineration. During the review it was noted that there were distressed sharps boxes at certain structures. There is an estimated need of 46 incinerators at the national level per the 2010 inventory conducted for the Optimize project. UNICEF intends to build 20 incinerators before the end of 2011. While waiting to fill this remaining gap, the strategies currently in place will continue: to use hospital and industry incinerators.

According to the 2010 external EPI review, AEFI management tools are available at the unit level but rarely used (36% of visited units). The PDM is involved in surveillance of AEFI and in the collection of data that show such effects. It shares its information with the DLP which transmits it to the anti-poison centre responsible for the link between observed symptoms and immunisation. Against a background of routine immunisation, AEFI monitoring performance remained low despite some progress. All AEFI cases (major or minor) must be recorded. There has been a change (increase) in the number of cases of AEFI recorded; this uptick accelerated after the introduction of the pentavalent vaccine.

Figure 3: Change in number of AEFI cases (major and minor) recorded from 2001 to 2009

III.7 SURVEILLANCE OF DISEASES AND FOLLOW-UP

The healthcare district is at the core of the surveillance system and has specific surveillance focal points for which training is provided (83% of districts visited during the external review) through support of the national network of laboratories, regional and hospital focal points. In the districts visited during the review, all of the staff questioned knew the case definitions for PFA and measles, as well as sample collection procedures for stools and blood. In half of the districts visited, the focal points involve at least one visit per month for healthcare training. A warning surveillance system for paediatric meningitis was set up with the Albert Royer Children's Hospital Site. After the introduction of the vaccine against hemophilus influenzae type B infections (part of the pentavalent vaccine), this surveillance was reinforced by its extension to seven regional sites.

A weekly epidemiologic surveillance bulletin is regularly published and includes all diseases under surveillance. The surveillance results are generally satisfactory, with required performance levels being attainted for major indicators.

This system of surveillance for potentially epidemic diseases suffers from the weak diagnostic capacity of outside laboratories for the confirmation of bloody diarrhea, cholera, and cerebrospinal meningitis. The functioning of the national network of laboratories should help improve this situation.

Table III: Performance indicators, targeted disease surveillance 2006-2009

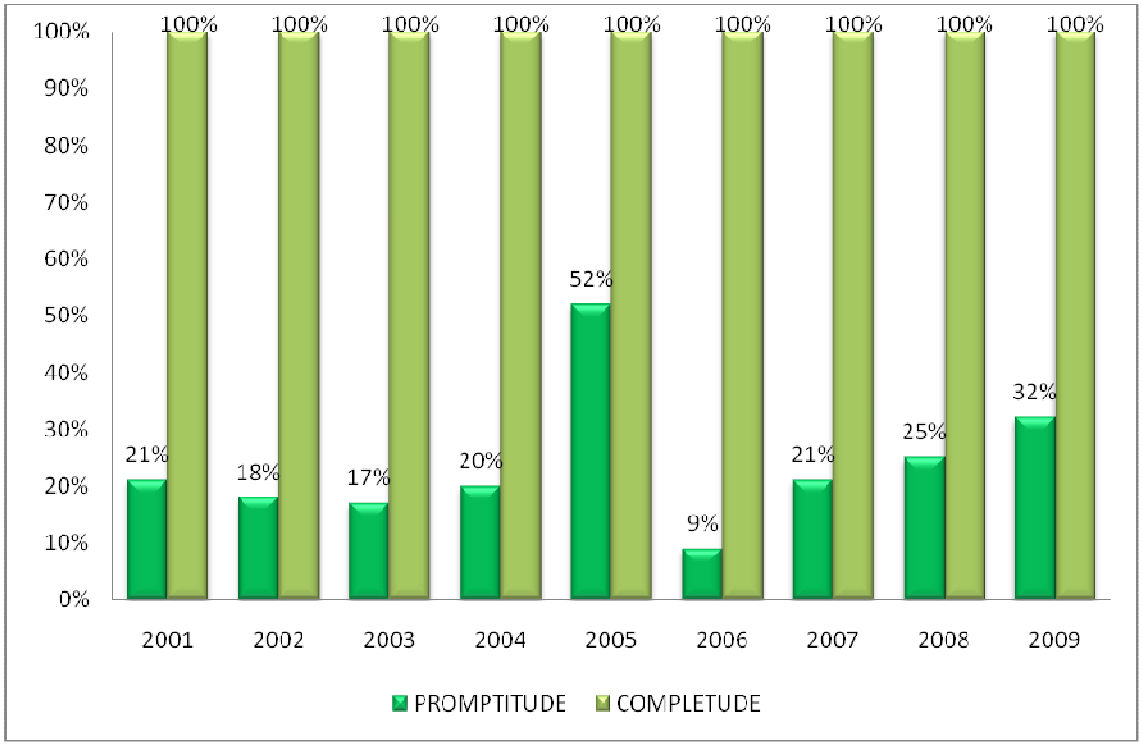
Indicators	2006	2007	2008	2009
Rate of non-polio AFP	2.8	4	3.9	3
Adequate stool samples (%)	90%	93%	93%	93%
Proportion of regions who have attained the standard of adequate stools and the rate of non-polio PFA	84%	91	85%	92%
Proportion of districts with less than one suspected case measles investigated with a blood sample	82%	89%	94%	98%
Proportion of TNN cases that were investigated	100%	100%	100%	100%
Proportion of TNN cases that were subject to follow-up	100%	100%	100%	100%

III.8 DATA MANAGEMENT

Vaccination data is collected at the vaccination unit level from the TACOJO and transmitted to the District in a monthly report. Computer input using the data management template is done at the district level and transmitted to both the medical region and national levels. A bulletin containing past information is published monthly at the national level after the data has been summarized and analyzed.

As shown in Figure 4, the completeness of district reports has been 100% since 2001 but, on the negative side, they were submitted punctually less than 50% of the time in 2005. The breakdown of vaccinated children by gender is not analysed because information on gender is not taken into account by the survey tools currently being used.

Since June 2010, a strike of healthcare agents—which involves them withholding information—has been taking place.



Note: Dark green = timeliness and light green = level of completeness

Figure 4: Change in the punctuality and completeness of data from 2001 to 2009

III.9 LESSONS LEARNED FROM THE INTRODUCTION OF NEW VACCINES

Having accepted GIVS, which dictates increasing the range of vaccines offered to protect against more diseases, Senegal successfully introduced into its routine EPI the Hepatitis B vaccine in 2004 and the vaccine for *Haemophilus influenzae* type b (Hib) in 2005, with the support of GAVI. These decisions had a significant effect on the involvement of healthcare authorities and on surveillance data. Senegal is committed to continuing to immunize after the end of funding provided by GAVI, and, to do so, has developed a funding plan to reach this objective. An evaluation of the introduction of the Hib vaccine shows the following:

- A detailed plan for the introduction of the vaccine was drafted. All the activities outlined in this plan were funded and implemented.
- The strategy was to introduce the vaccine to the entire country at the same time.
- Children who had begun their immunisation series with the DTC-Hep continued it with the penta. There was no system for catching up children who only received one or two doses of penta;

- There were no problems with inventory capacity because an inventory was performed to identify the gaps and to then fill them.
- To prevent the risk of the penta vaccine freezing, a new directive was made that forbade freezing all types of vaccines at the intermediary and peripheral levels. The implementation of automatic temperature recording for all warehouses throughout the country has been planned for before the end of 2011.
- Loss rates that had continually dropped since 2001 climbed after the introduction of penta in 2005. This can be explained by problems with the reporting system and also by the destruction of DTC-Hep inventory at the vaccination unit level.
- Before the vaccine was introduced, all the healthcare agents were trained. The training modules used combined knowledge of traditional vaccines, and surveillance and management principles covering all the areas that apply to EPI. This training was consolidated on the ground by training supervision. This supervision was an opportunity to support all EPI directives as well as surveillance.
- To market the new vaccines, new media materials were needed. This made the media campaign possible, and, increased the program's visibility with a particular focus on the new vaccines.
- The need to monitor the effects of the new vaccines allowed for AEFI surveillance to be relaunched for all antigens.
- All support materials were reviewed, revised and updated to integrate information about the new vaccines. There was a loss of data with regard to DTC and Hepatitis (HB) which were no longer counted in the new system which had adopted Penta1, Penta2, Penta3 to replace DTC- HB1, DTC- HB2, DTC- HB3.
- After the introduction, the partners lobbied the Political Authorities for a commitment to co-funding. This commitment allowed for further oversight of the purchasing process for vaccines and supplies and this process did see an increase.
- A slight drop in coverage was noted (penta3 /DTC3) as was an increase in drop-out rates for 2005. These situations are the result of a problem with data reporting. Children who completed their series with penta were reported as penta 1 instead of DTC2 or DTC3. This problem was quickly resolved with supervision.

- A significant decrease in cases of bacterial Hib meningitis was noted (see chapter III.12.2.5)

III.10 INTEGRATION OBSERVATIONS

Vitamin A has not yet been included in the routine EPI, although a national directive was written and distributed for this purpose. The principal reason for this situation is the unavailability of vitamin A at the immunisation units. Vitamin A is bought at the PNA by the districts and redistributed free of charge. The few districts that have implemented this integration are not supplying regular information to the central level due to the lack of a computer system and appropriate data management.

Setting up the CIME strategy in certain districts allowed effective integration of vaccination activities into other activities such as: the verification of nutritional status, treatment of diseases, vitamin A supplementation, and getting rid of parasites. Improvements to this program are underway.

The mass immunisation campaigns were often coupled with the distribution of vitamin A, MII, and getting rid of parasites.

From 2006 to 2009, Senegal conducted a feasibility study about intermittent preventive treatment for childhood malaria for those aged 0 to 1; this was coupled with the EPI in the districts of Velingara, Kedougou and Saraya, which are located in the southeast region of the country in a zone of stable malaria transmission. The results showed that integration with the TPIn allowed for the routine EPI to be strengthened and this served as the stimulus. Increased use of TPIn in the zones where transmission of malaria is intense to moderate lasts 6 months or more. The regions involved are Tambacounda, Kedougou, Kolda, Sedhiou and Ziguinchor. This effort was confirmed in the new strategic plan for combatting malaria (2011-2015).

Plans include transporting and distributing vaccines supplies to the PNA-PRA circuit. This circuit is the one used to distribute medications and crucial generic products and those for other programs. An Optimize pilot study is underway in the region of Saint Louis. If the results

of this study are conclusive, the approach will be progressively implemented throughout the country.

Senegal adopted a regional surveillance strategy for addressing disease and follow-up (SIMR) in an integrated way. Within the Ministry of Health and Prevention, surveillance is within the same department as EPI. The diseases that are the subject to surveillance are the following:

- The target diseases for EPI, specifically those that are targeted for eradication elimination
- Diseases with epidemic potential: cholera, meningitis, shigellosis, flu, rabies
- AEFIs.

USAID community health project integration with community-based surveillance is planned for PFA, measles, yellow fever and neonatal tetanus. This will be within the package of activities that are part of the agreement between USAID and the the NGO consortium. Additional funding by UNICEF will contribute to covering the entire country.

With regard to follow-up, meetings are jointly organized by the different programs (EPI, PNLP, PNT), each quarter between the teams at the central level and team members from the districts and regions. The goal is to review the activities that took place during a given period. The targeted goal was to maximize the resources used but also to better plan activities, allowing districts and regions access to global, integrated plans of action.

The Ministry of Health has an operational plan for scaling high-impact interventions to the national level to reduce maternal, infant and child mortality. These interventions were selected on the basis of scientific evidence and by targeting mothers, newborns, and children. Their inclusion together in a minimum package (MP) as well as in a complete package (CP) is to offer a group of care offerings to mothers, newborns and children in an integrated way. This is the case as well as for the household/community level, primary healthcare entities which provide regular services to the population, and for entities that provide individual clinical services. The EPI is a intervention within the minimum package and is a draw for other parts of the package.

III.11 RESULTS OBTAINED BY THE PROGRAM

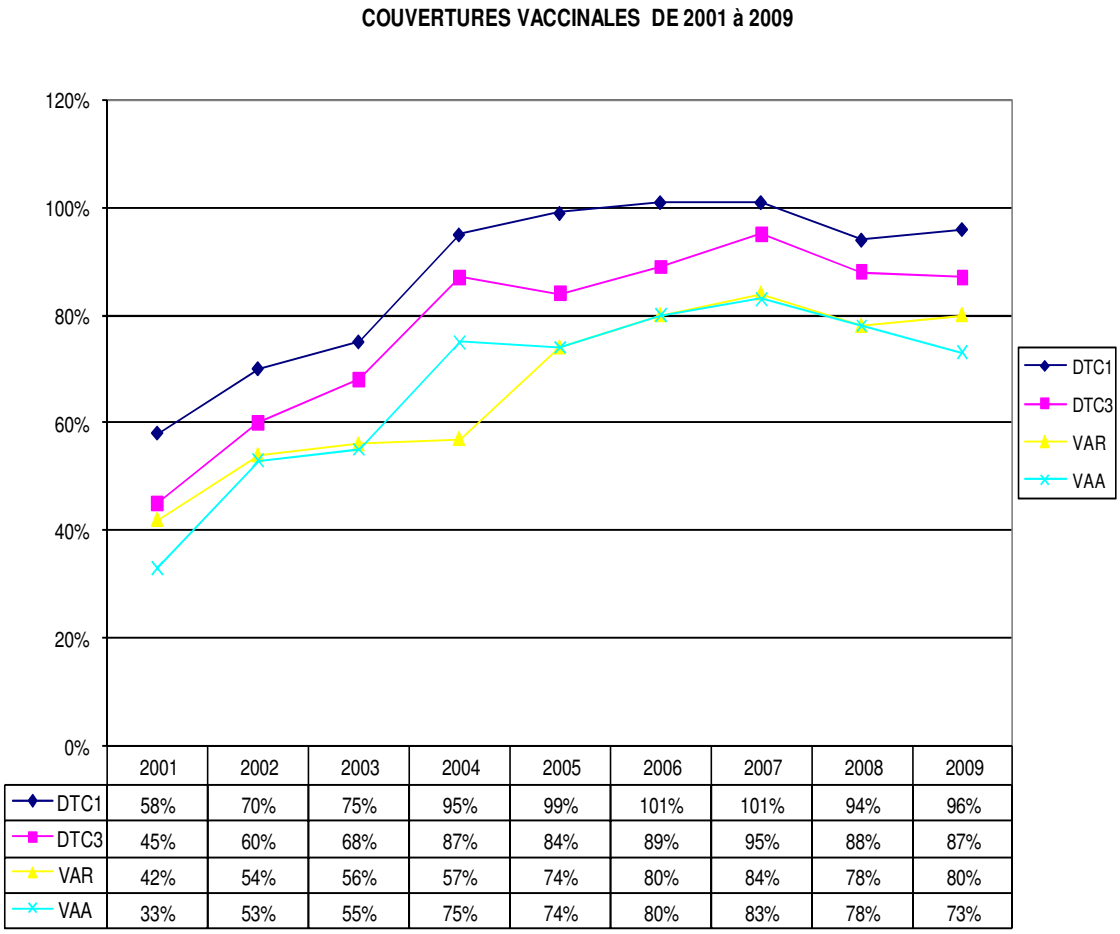
III.11.1 Vaccination coverage

Significantly improved coverage for all antigens has been observed since 2001. The change in coverage can be broken down into 3 periods:

- From 2001 to 2004 with a significant increase in coverage
- From 2004 to 2007 with a less-pronounced increase
- From 2007 to 2009 with a dip in coverage in 2008.

DTC3 coverage (penta 3 since 2005) has increased from 45% in 2001 to 87% in 2009; that of MCV went from 42% in 2001 to 80 % in 2009. There was an observable constant increase in districts having a DTC3/Penta 3 cover rate above 8O%. This number went from 4% to 2001 to 71% in 2009. During the same time period, the proportion of districts with coverage less than 50% strongly declined, dropping to 60% in 2001 from 0% since 2005 (figure 5). The Penta1/Penta3 loss rate remained at acceptable levels despite a slight increase between 2005 and 2006, due to a reporting problem linked to the introduction of penta and the withdrawal of the DTC- Hep vaccine in the middle of the year. The differences in coverage between YFV and the MCV in 2004 and in 2009 were due to an interruption in the supply of the yellow fever and measles vaccines. The DTC1 (Penta1) / DTC3(Penta3) drop-out rates have seen a constant drop since 2001 and are currently below the threshold of 10%. In 2005 this rate increased following the introduction of penta due to a reporting problem between this vaccine and DTC. The 2010 data was not fully collected due to a strike that invovled holding back health-related information.

Even if the lack of information about confidence intervals does not allow for a true comparison between survey data, a stable rise in coverage during the period can be noted. These surveys also show a decrease in the proportion of “zero dose” children (those who have received no vaccines).



	2001	2002	2003	2004	2005	2006	2007	2008	2009
DTC1	58%	70%	75%	95%	99%	101%	101%	94%	96%
DTC3	45%	60%	68%	87%	84%	89%	95%	88%	87%
VAR	42%	54%	56%	57%	74%	80%	84%	78%	80%
VAA	33%	53%	55%	75%	74%	80%	83%	78%	73%

Figure 5: Change in vaccination coverage in Senegal 2001- 2009

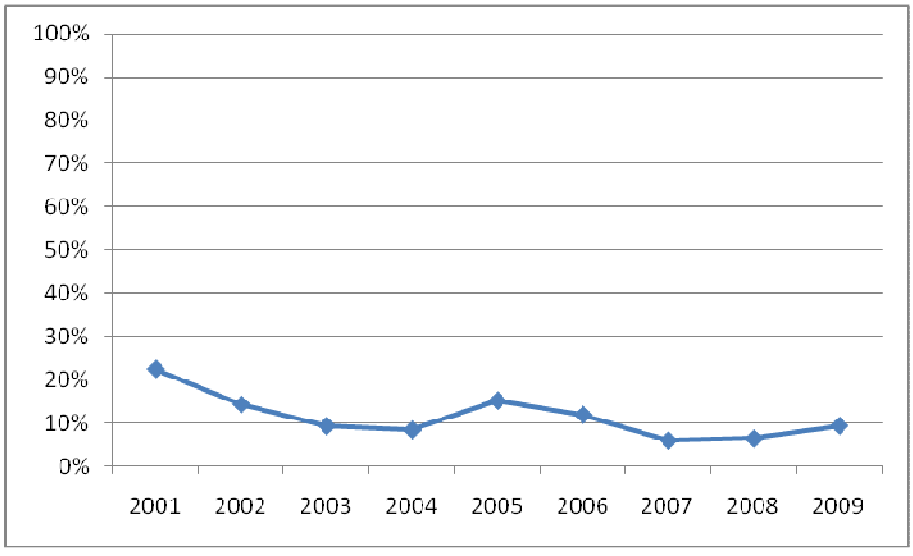


Figure 6: Change in drop-out rate for DTC1(Penta1)/DTC3(Penta3) from 2001 to 2009

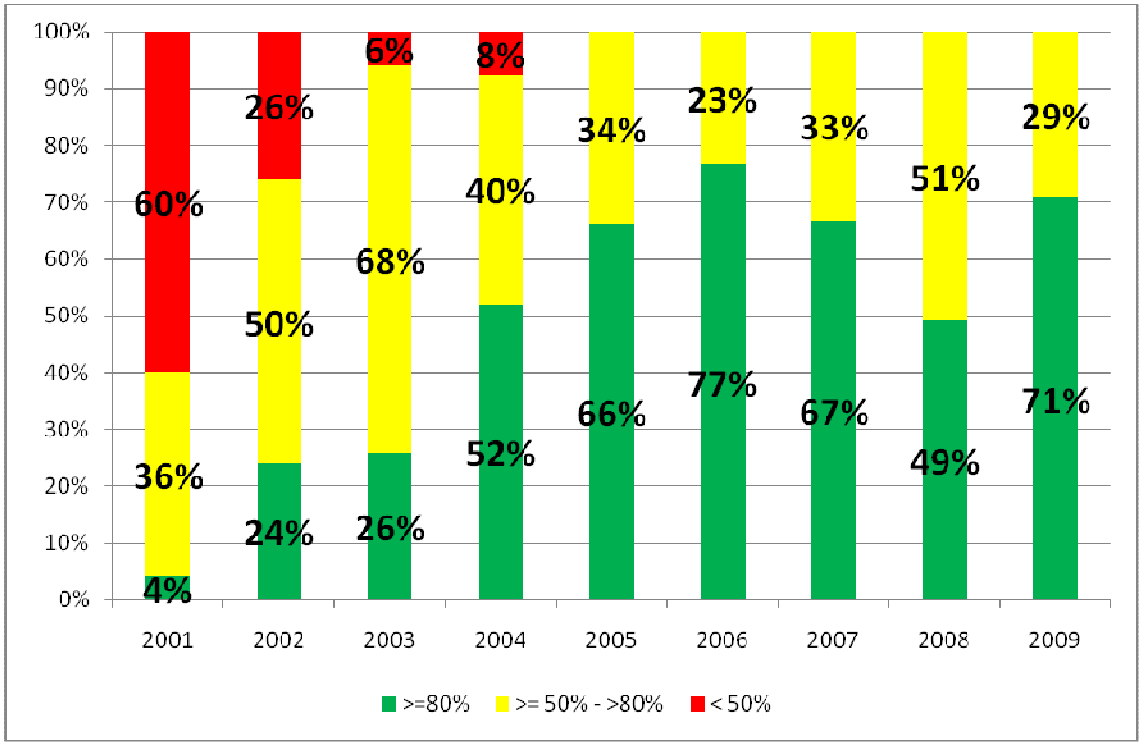


Figure 7: Distribution of districts based on DTC3 performance from 2001 to 2009

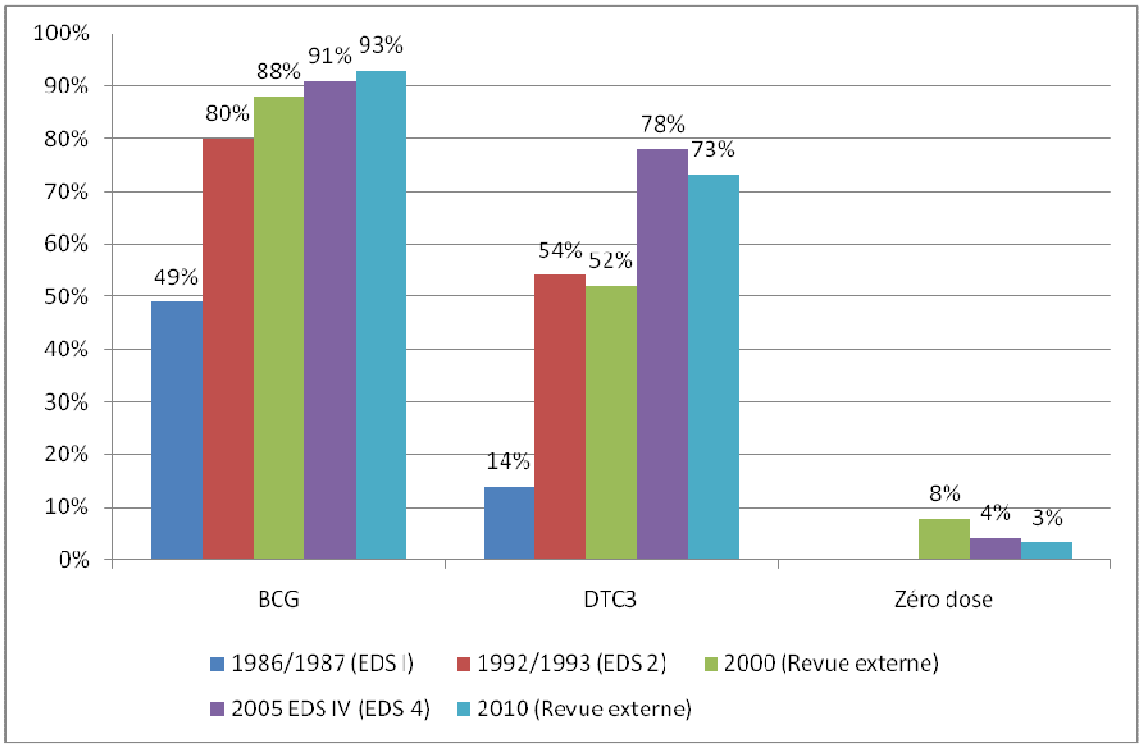


Figure 8: Immunisation coverage change and the proportion of zero dose children in Senegal according based on surveys

III.11.2 Struggle against the target diseases of EPI

III.11.2.1 Polio Eradication

The last case of polio in Senegal was recorded in 1998. Senegal was declared free of WPV circulation in 2004. These results were achieved due to a steady increase in the coverage of OPV3 to more than 80%, active surveillance of PFA leading to attaining the 2 major indicators on a yearly basis (PFA non-polio rate and proportion of adequate samples), and the organisation between 1997 and 2005 of several editions of high-quality NVD with a coverage rate of over 99%. However, following a decrease in performance noted in 2007 and the intense circulation of WPV in Western Africa, the country was subject to importation of WPV and 18 cases were recorded in the country between January and April 2010; this was the impetus for the country to organize six rounds of polio NVD.

III.11.2.2 The struggle against measles

The number of measles cases was estimated at 25,000 in 2001, with close to 1,000 deaths. Organising the immunisation catch-up campaign for the target age bracket of 9 months to 14 years in January 2003 (95% coverage) and the increase of routine coverage at the VAR, which rose from 42% in 2001 to 80% in 2009, has produced a significant decrease in the number of cases of measles. The surveillance of measles showed that the number of confirmed cases went from 31 in 2004 to 0 (zero) in 2005. However, in June 2009 the country had an epidemic with 906 cases of measles (confirmed by laboratory or epidemiological link). A follow-up campaign was organised in 47 at-risk districts in March 2010 and another follow-up at the national level was organized for March of the same year.

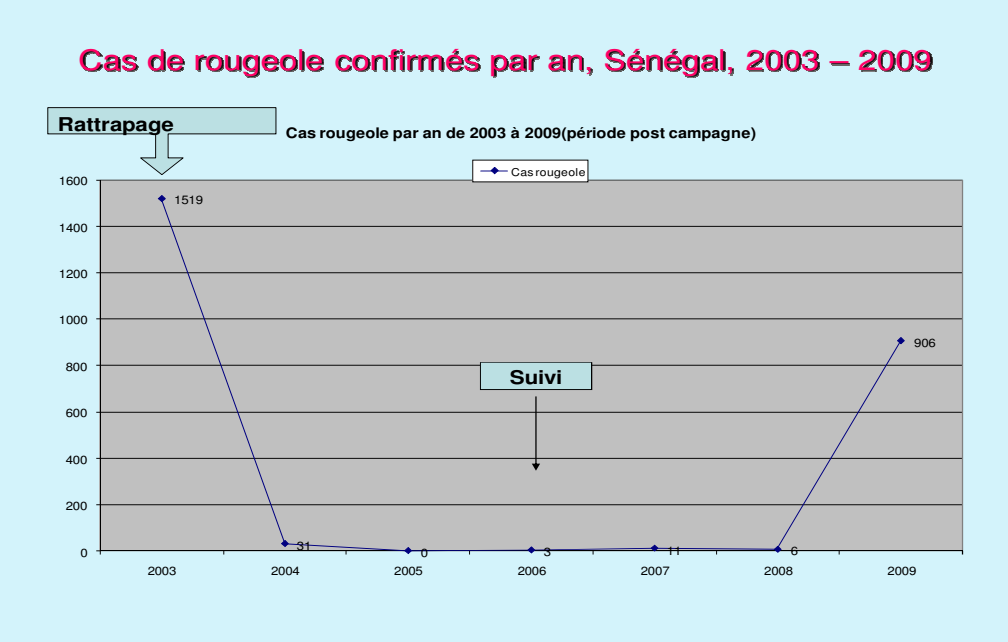


Figure 9: Development of suspected cases and deaths connected to measles 2001 to 2009

III.11.2.3 Elimination of Maternal and Neonatal Tetanus

The number of cases of neonatal tetanus decreased from 33 to 16 between 2003 and 2009 and, during the same period, the number of districts with high risk for MNT decreased from 14 to 2. Since 2008, no district has reported more than one case per 1,000 live births. These results were attained due to improved childbirth conditions, improved routine coverage, and the organisation of FAR immunisation campaigns in high-risk districts.

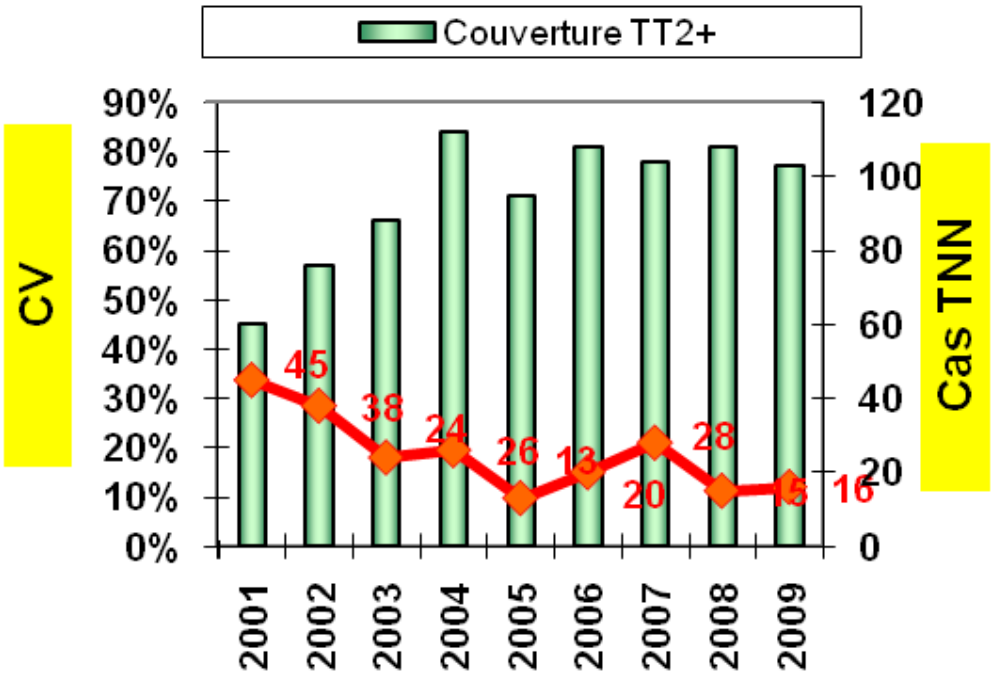


Figure 10: Change in VAT2 coverage for pregnant women and recording of MNT from 2001 to 2009

Table 4: Evolution of risk indicators or protection against MNT from 2006 to 2009

Indicators	**2006**	**2007**	**2008**	**2009**
% TT2+ (pregnant women):	86%	78%	81%	78%
PNC use rate	84%	74%	39%	81%
Assisted childbirth rate	59%	56%	52%	67%
DTC 3 coverage	89%	94%	88%	87%
Proportion of districts having reached the goal of less than one case of MNT per 1,000 live births	100%	100%	100%	100%

Source, Ministry of Health and Prevention administrative data

III.11.2.2 Control of yellow fever

Since 2006, Senegal has not recorded an indigenous case of yellow fever and the routine coverage has increased from 33% in 2001 to 70% in 2010. All the districts organized preventive campaigns or follow-up campaigns between 2002 and 2007.

III.11.2.5 Bacterial Hib meningitis

The number of bacterial Hib meningitis cases has continued to decrease since the introduction of the vaccine in 2005 with 1 single case in 2008, as shown in Figure 11. At the same time, the proportion of bacterial Hib meningitis among bacterial meningitis cases has also decreased. Incidents in infants aged less than 1 year has decreased from 21.5 cases per 100,000 to 1.4 from 2003 to 2007.

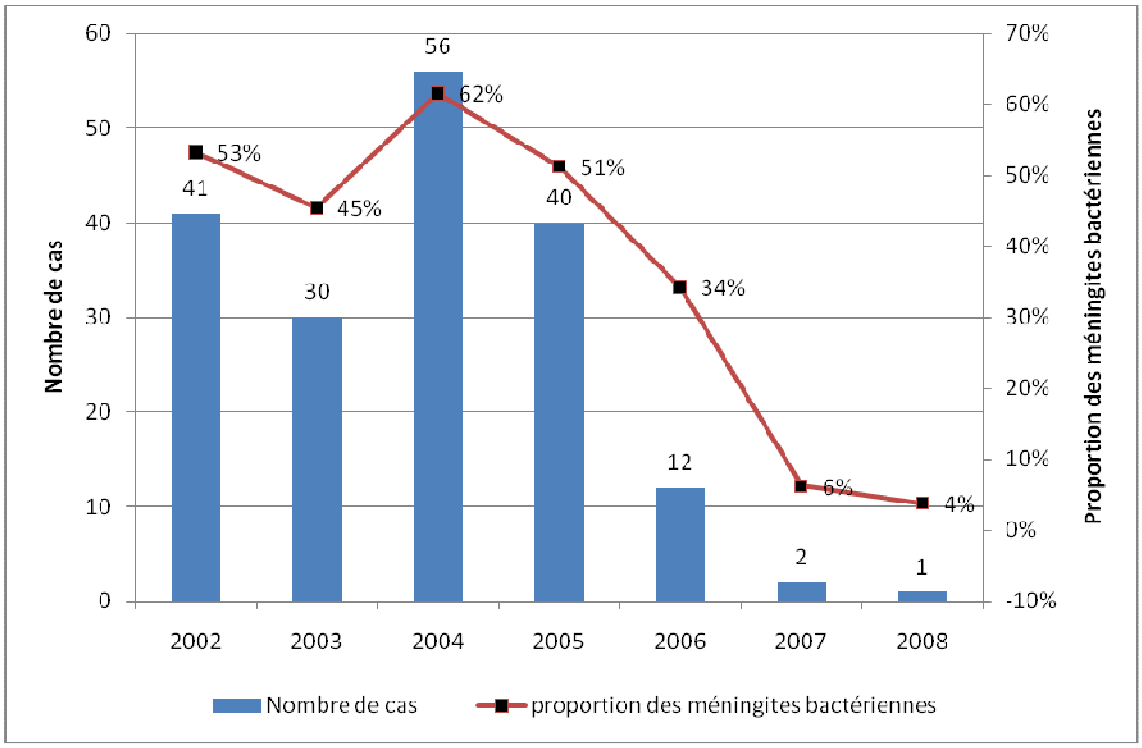


Figure 11: Number of cases and proportion of HIB within bacterial meningitis cases at the Albert Royer hospital in Dakar from 2002 to 2008

Table V: Summary of situation analysis

Component	Strengths	Weaknesses	Opportunities	Threats
Organisation and management of the program	Meetings held by ICC's Policy and technical committee Lobbying role and mobilization of resources by ICC policy and Holding of quarterly data monitoring meetings	The lack of management autonomy Non-involvement by NGOs and organization of the civil company at technical ICC Limited collaboration between EPI and other health programs BRISE non-functional in the majority of regions	Reforms underway at the DREAT level to strengthen EPI's institutional position HSS to improve collaboration between different programs Introduction of new vaccines	Repeated holding back of data for follow-up evaluation
Logistics, management of vaccines and supplies, infection safety	Computerized management of stocks Sufficient inventory capacity at the national level and healthcare stations Five-year rehabilitation and logistics plan Strengthening human resources at the logistical level Agreement with the PNA to transport and distribute vaccines Systematic use of of SAB, SD, and BS in all PPS Good mastery of vaccination techniques	Insufficient inventory capacity for vaccines at regional and district levels Aging cold chain in majority of units Poor use of management tools Absence of system monitoring stability of temperature. Insufficient logistical transport (motorcycles, supervision vehicles) Lack of equipment maintenance plan Low availability of emergency generators at peripheral level Insufficient incinerator coverage Slowness in purchasing procedures as related to State's budget	Development partners disposed to investing in logistical improvements and support for training and maintenance Mobile warehouse pilot project (Optimize) HSS	Interruptions in electricity supply
Communication and social mobilisation	Knowledge of vaccination and EPI target diseases by the population Participation by the population in immunisations. Existence of structures responsible for communication at all levels. Support from partners Access to community networks	The absence of a national communication plan for EPI Weak approach by the DPM's Bureau of Communication to EPI communication Unsatisfactory collaboration between DPM and SNEIPS Lack of evaluation of EPI communication activities Unsatisfactory support and other communication materials for the routine EPI Social mobilization only during campaigns	Variety and diversity of the media network Possibility of integration with the other health programs Existence of relay network and community players Existence of community involvement in USAID/SENEGAL healthcare program	

Component	Strengths	Weaknesses	Opportunities	Threats
Reinforcement of qualifications	Existence of national guide on EPI EPI training modules available Existence of a pool of doctors trained in applied vaccinology and management (EPIVAC) Training of instructors and paediatrics in applied vaccinology	Insufficient initial training and longevity of personnel at the district level Irregularity of supervision training at all levels Insufficient documentation about supervisions carried out	Existence of other programs resources that can be mobilized for integrated supervision at the district level (malaria, tuberculosis, HIV, etc.) Project to update training curricula for HSS	
Providing health services	Vaccination provided regularly, at least one time per month in all units Vaccination sessions well organized Existence of relaunch plan for PDV with the community Campaigns well-organized Good experience introducing new vaccines	Planning sessions without community input Insufficient and irregular advanced and mobile strategies At times, interruption in supply of antigens at service level due to poor planning Insufficient IPC during vaccination sessions Insufficient documentation on PDV research activities and good practice in general. Insufficient specific strategies for reaching difficult-to-access populations Difficulties in mobilizing campaign resources in a timely manner	Possibility of benefitting from SVAs to improve planning and organization of services Good PNC coverage Organisation of JSE to possibly be used to integrate vaccination with other health programs Improvement in healthcare coverage by creating new districts	
Surveillance	Existence of an accurate system of epidemiological surveillance Existence of a national network of laboratories Support from partners	Follow-up activities often take place late with regard to epidemics often linked to difficulties in mobilizing resources Insufficient surveillance at the community level Weak confirmation of bacterial diseases at the operational level	Existence of surveillance integration project at the community level under the USAID/ SENEGAL healthcare community programs	
Funding	Existence of two EPI sub-components, surveillance and follow-up in FMSE Secure budget line item for the purchase of vaccines and supplies Funding participation by healthcare committees Indemnity allocated to service providers for advanced and mobile activities.	Lack of funding autonomy for those responsible for EPI Insufficient resources allocated to EPI Postponements in the availability of funds at all levels	Possibility of making the program independent via the reforms in the DREAT study	Budgetary restrictions at the State level

Component	Strengths	Weaknesses	Opportunities	Threats
Outcomes	Very good accessibility: Penta1 at 96% in 2009 Good Penta 3 coverage : 87% in 2009 Acceptable drop-out rate: 9% in 2009			Repeated withholding of information could compromise follow-up of execution
Impact	Ending the circulation of the indigenous wild polio virus No case of death from measles recorded since 2005			Risk of imported WPV

IV. VISION AND PRIORITIES

EPI's current vision is in tune with GIVS and is focusing on the following points:

- Immunisation is critical for reinforcing healthcare systems in general, and for reaching the Millennium Development Goals (MDG), and specifically, for reducing infant-juvenile mortality and maternal mortality, in partnership with other healthcare programs focused on the child
- The use of immunisation as the best way to improve health and security throughout the world
- The solidarity of the international community that is necessary to guarantee that everyone has fair access to indispensable vaccinations

The program priorities for the 2012 – 2016 period are:

- Eradication, elimination, and control of preventable diseases by vaccination
- Sustained program funding
- Regular supply delivery and improvement of vaccine management
- Adequate upgrading and maintenance of CDF equipment and of logistics on wheels
- Waste management
- Integration with the other health programs
- Equitable services offered
- Introduction of new vaccines
- Improving EPI communication.

V. OBJECTIVES AND STRATEGIC ORIENTATION AND CALLS TO ACTION

V.1 OBJECTIVE

EPI's objective is to contribute to the reduction of infant and juvenile mortality and the improvement of maternal health by vaccination and by surveillance of targeted EPI diseases and potentially epidemic diseases. Specifically, from between now and 2016, the goal will be to:

1. Reach vaccination coverage of at least 95% for BCG, penta 3, polio 3, pneumo 3 and Rota 2 in infants aged 0 to 11 months, at the national level
2. Reach vaccination coverage of at least 90% for MCV and AAV in infants aged 0 to 11 months, at the national level
3. Reach vaccine coverage of at least 90% for BCG, penta 3, polio 3, pneumo 3 and Rota 2 for infants aged 0 to 11 months, in every district
4. Reach vaccine coverage of at least 85% for MCV and AAV for infants aged 0 to 11 months, in every district
5. Reach at least 90% of vaccine coverage for VAT 2+ for pregnant women, in every district
6. Maintain stoppage circulation of the wild indigenous polio virus
7. Stop transmission of the indigenous measles virus
8. Eliminate neonatal and maternal tetanus (MNT)
9. Ensure the prevention of yellow fever epidemics
10. Ensure the prevention of meningitis epidemics
11. Introduce pneumococcal vaccine into routine EPI by 2012
12. Introduce rotavirus vaccine into 2013 routine EPI
13. Provide 100% of funding for traditional vaccines and supplies as well as co-financing of new vaccines through the national budget.

V. 2. STRATEGIC AXES AND ACTION ITEMS

Using action items to implement strategic axes will allow the program's goals for each component to be attained on a global scale. Improved equality in accessing vaccination services requires improved knowledge of difficult populations so that their specific needs are better taken into account during the planning phase. To do so, the national level will need to draft directives that are targeted at aiding districts. Good coordination of strategy implementation allows for regular follow-up, information to be shared between different players for united and more efficient measures to take place and increase the program's successes. One of the major difficulties seen at the operational level (specifically at the healthcare stations) is poor mastery of vaccination targets along with coverage risks due to errors, as well as difficulties in vaccine management. Therefore, it is necessary to continue the census and updates at the local level to come up with targeted forecasts. The country adheres to GIVS' strategic vision of obtaining the MDGs; the range of vaccinations offered will be

expanded to include pneumonia and rotavirus within the EPI routine through the organisation of a mass campaign against Meningococcus A and, finally, its introduction into the EPI routine as well.

The external EPI review showed the need to reinforce the capacities of participants to achieve a higher quality of management and program implementation. This will be done through training, as well as training supervision about the program's different areas, and through rewarding good performance.

A plan of action following the survey on efficient management of vaccines and inventory of logistics was drafted to grow EPI's logistical performance. Follow-up on the implementation of these directives will be one of the major priorities in the CMYP.

The lack of a specific EPI communication plan was one of the major issues noted by the external review. It is, therefore, imperative that there be a communication plan that is based on the evidence and takes into account past successful experiences so that the program is more visible and that participation among the population grows. This will be done in close collaboration with SNEIPS and in partnership with all those involved in communication.

The weak bacteriological confirmation of diseases with epidemic potential remains an element of the surveillance system that is lacking. Overall, however, the system is globally successful. In the same vein, reinforcing laboratory capacity for this is one of the plan's priorities, to increase early detection of cases to be able to react in a timely manner.

The SVAs will now be pursued to maintain what has been attained as far as eradication and elimination and control of disease, plus the successes in the EPI routine. Considering the risk of WPV being imported and the need to reinforce childhood immunity, a minimum of two polio SVAs will be organized every year. To control measles, because of the possibility of the accumulation of susceptible individuals, a follow-up campaign will be organised. The campaign's date (between 2013 and 2015) will be decided in relation to the level of the accumulation of susceptible individuals, considering routine coverage. In addition, if the routine coverage achieves 95% for each district before 2016, the introduction of a second dose of MCV into the routine is possible. Considering the yellow fever vaccine protection period, all districts which have organised campaigns in the last 10 years will need to run them again. Because the country is part of the meningitis belt, the resurgence of epidemics in the sub-region and the existence of a new and efficient vaccine with a long protection period (10

years), a preventive campaign against meningitis A avec with MenAfriVac will be organized in the regions with the highest risk.

After the FAR vaccination campaigns are implemented in all districts at high risk for MNT and in light of related successes, the country intends to request validation that MNT has been eliminated. Since the introduction of new vaccines into the EPI routine will substantially increase resource needs due to costs higher than traditional vaccines, the question of the program's funding viability must be followed closely.

For each strategic axis, action items have been identified.

Table VI: Strategic approaches and action items

Components	STRATEGIC AXES	ACTION ITEMS
Organisation and management of the program	Improved equality in access to vaccination services	Draft a national plan supporting specific districts for reinforcement of vaccination in zones or populations that are difficult to access
		Draft an annual EPI plan for all districts, integrating appropriate strategies to access difficult-to-reach populations
	Improved coordination at all levels	Holding meetings on ICC policy every six months
		Involve all interested partners in the ICC technical meeting
		Regularly organize quarterly monitoring meetings at the central, regional and district level
		Regularly organize coordination meetings at the regional and district levels
	Master forecasting targets	Proceed to target census for children aged less than one year in all districts for self-monitoring
	Improving human resources	Reinforce personnel for BRISE for the 14 medical regions tmake them functional
	Enlarge the range of vaccines offered	Introduce the pneumococcus vaccine
		Introduce rotavirus vaccine
Capacity building	Reuse of training	Train and/or reuse all personnel involved in the program's management and implemenation
		Finalize the draft of the EPI guide
		Integrate the EPI modules and CDF maintenance into the training curricula for healthcare agents
	Training supervision	Perform training supervisions on a regular basis and document it with written feedback at all levels (central, regional and district)

Components	STRATEGIC AXES	ACTION ITEMS
	Reward good performance	Implement a reward system for good performance
Logistics and management of vaccines	Upgrade logistics	Implement a five-year upgrade plan for logistics and GEV
	Encourage use of equipment that uses solar energy	Implement solar refrigerators without batteries in targeted zones
	Maintenance and equipment	Draft and implement a maintenance plan for CDF equipment and for de logistics on wheels
	Automate temperature monitoring	Implement automatic temperature recording at all vaccine warehouses
	Reinforce the computer management system	Include in survey collection tools data about logistics
		Ensure accurate data archiving
Provision of services and integration of activities	Improve planning	Create good planning for vaccination activities
	Improve the quality of services	Correctly execute the planned activities
		Ensure that immunisation is performed by qualified personnel
		Create a good ICP for vaccination sessions
		Reinforce AEFI monitoring
	Community involvement	Involve the community in planning vaccination activities
	Equality in services offered	Identify populations that are difficult to reach and implement specific strategies to access them
	Self-monitoring of performance	Implement self-monitoring curves for each vaccination unit and keep them up-to-date
	Active follow-up of targets	Make systematic and document follow-up activities related to targets
		Benefit from SVAs to actively follow-up on targets
	Integration with the other health programs	Integrate vaccination with other activities related to the survival of children at the operational level
Communication	Planning	Draft a global communication plan for the routine vaccinations, founded on evidence
	Benefit from successful experiences	Reward and share innovations and successful experiences due to good communication practice in support of EPI
		Plan ways to recognize good performance
	Improvement of coordination	Reinforce DPM's communication bureau's human resources
		Improve collaboration between SNEIPS and DPM
		Re-ignite social mobilization committees at all levels

Components	STRATEGIC AXES	ACTION ITEMS
	Update tools	Revise and adapt communication support tools
	Monitoring and evaluation	Create tools and mechanisms for follow-up evaluation.
	Partnership	Integrate EPI into the communication activities of other programs (PNLP,PNT,DSR,CNLS, and the USAID/Senegal community healthcare program)
		strengthen the partnership with community media and radio
		Develop a partnership with NGOs and OCBs
	Mobilization of funding resources	Mobilize according to the program's budget for resources to support EPUI communication activities
Safety of injections and management of waste	Accurate supplies for SAB,SD and BS	Maintain availability of acquired supplies for SAB,SD et BS
	Appropriate waste disposal	Establish a partnership with PRONALIN.
Epidemiological monitoring	Improved confirmation of cases	Reinforce laboratory capacity for the bacteriologic confirmation of diseases with potential for epidemic
	Sufficient follow-up of epidemics	Implement follow-up fund for epidemics
	Eradication, elimination and control of targeted diseases	Continue polio SVAs
		Organize a follow-up campaign against measles
		Organize a preventive campaign against yellow fever
		Organize a preventive campaign against meningitis with MenAfriVac in 8 regions (Laolack, Kaffrine, Tamba, Kolda, Diourbel, Fatick, Sedhiou and Kedougou)
		Organize a survey to verify the elimination of maternal and neonatal tetanus
Financing the program	Financial independence of the program Financial sustainability	Lobby for reform that will give EPI financial independence
		Increase the EPI budget to guarantee that vaccines will be purchased and support the investments

VI. PLAN FOR IMPLEMENTATION

The multi-year 2012-2016 plan will be implemented and will be annually updated via annual work plans. This dynamic process will be able to include any changes.

Table VII: Implementation Plan

STRATEGIC AXES	ACTION ITEMS	2012	2013	2014	2015	2016
Improved equality in access to vaccination services	Draft a national plan supporting specific districts for reinforcement of vaccination in zones or populations that are difficult to access	X	X	X	X	X
	Draft an annual EPI plan for all districts, integrating appropriate strategies to access difficult-to-reach populations	X	X	X	X	X
Improved coordination at all levels	Hold meetings on ICC policy every six months	X	X	X	X	X
	Involve all interested partners in the ICC technical meeting	X	X	X	X	X
	Regularly organize quarterly monitoring meetings at the central, regional and district level	X	X	X	X	X
	Regularly organize coordination meetings at the regional and district levels	X	X	X	X	X
Master forecasting targets	Proceed with census for targeted children: aged less than one year in all districts, for self-monitoring	X	X	X	X	X
Improving human resources.	Reinforce personnel for BRISE for the 14 medical regions to make them functional	X				
Enlarge the range of vaccines offered	Introduce the pneumococcus vaccine	X				
	Introduce rotavirus vaccine		X			
Reuse of training	Train and/or reuse all personnel involved in the program's management and implementation	X				
	Integrate the EPI modules and CDF maintenance into the training curricula for healthcare agents		X			
	Finalize the EPI guide draft	X				

STRATEGIC AXES	ACTION ITEMS	2012	2013	2014	2015	2016
Training supervision	Perform training supervisions on a regular basis and document it with written feedback at all levels (central, regional and district)	X	X	X	X	X
Reward good performance	Implement a reward system for good performance	X				
Upgrade logistics	Implement a five-year upgrade plan for logistics and GEV	X	X	X	X	X
Encourage use of equipment that uses solar energy	Implement solar refrigerators without batteries in targeted zones		X	X	X	X
Maintenance and equipment	Draft and implement a maintenance plan for CDF equipment and for logistics on wheels	X	X	X	X	X
Automate temperature monitoring	Implement automatic temperature recording at all vaccine warehouses	X				
Reinforce the Computer Management System	Include data about logistics in survey collection tools	X				
	Ensure accurate data archiving	X	X	X	X	X
Improve the quality of services	Correctly execute the planned activities	X	X	X	X	X
	Ensure that immunisation is performed by qualified personnel	X	X	X	X	X
	Create a good ICP for vaccination sessions	X	X	X	X	X
	Reinforce AEFI monitoring	X	X	X	X	X
Community involvement	Involve the community in planning vaccination activities	X	X	X	X	X
Equality in services offered	Identify populations that are difficult to reach and implement specific strategies to access them	X	X	X	X	X
Self-monitoring of performance	Implement self-monitoring curves for each vaccination unit and keep them up-to-date	X	X	X	X	X
Active follow-up of targets	Make systematic, and document, follow-up activities related to targets	X	X	X	X	X

STRATEGIC AXES	ACTION ITEMS	2012	2013	2014	2015	2016
	Benefit from SVAs to actively follow-up on targets	X	X	X	X	X
Integration with the other health programs	Integrate vaccination with other activities related to the survival of children at operational level	X	X	X	X	X
Planning	Draft a global communication plan for routine vaccinations, founded on evidence	X				
Benefit from successful experiences	Reward and share innovations and successful experiences due to good communication practice in support of EPI	X	X	X	X	X
	Plan ways to recognize good performance	X				
Improvement of coordination	Reinforce DPM's communication bureau's human resources	X				
	Improve collaboration between SNEIPS and DPM	X	X	X	X	X
	Re-ignite social mobilization committees at all levels	X				
Update tools	Revise and adapt communication support tools	X	X			
Monitoring and evaluation	Create tools and mechanisms for follow-up evaluation.	X				
Partnership	Integrate EPI into the communication activities of other programs (PNLP,PNT,DSR,CNLS, and the USAID/Senegal community healthcare program)	X	X	X	X	X
	Strengthen the partnership with community media and radio	X				
	Develop a partnership with NGOs and OCBs	X				
Mobilization of funding resources	Mobilize according to the program's budget for resources to support EPI communication activities	X	X	X	X	X
Accurate supplies for SAB,SD and BS	Maintain availability of acquired supplies for SAB, SD et BS	X	X	X	X	X
Appropriate waste disposal	Establish a partnership with PRONALIN.	X				
Improved confirmation of cases	Reinforce laboratory capacity for the bacteriologic confirmation of diseases with epidemic potential	X				
Sufficient follow-up of epidemics	Implement follow-up fund for epidemics	X	X	X	X	X
Eradication, elimination and	Continue polio SVAs	X	X	X	X	X
	Organize a follow-up campaign against measles			X		

STRATEGIC AXES	ACTION ITEMS	2012	2013	2014	2015	2016
control of targeted diseases	Organize a preventive campaign against yellow fever	X	X	X	X	
	Organize a preventive campaign against meningitis in the 8 targeted regions	X				
	Organize a survey to verify the elimination of maternal and neonatal tetanus	X				
Financing the program	Lobby for reform that will give EPI financial independence	X				
	Increase the EPI budget to guarantee that vaccines will be purchased and support the investments	X	X	X	X	X

Table VIII: Vaccine and supplies forecast for routine vaccinations

Year	Pop Tot	Target population				Additional vaccinations						Cost $			
		bOPV1+3	Men_A	YF	Measles	bOPV1+3	Men_A	YF	SAB_0.5ml	Sdilution_5ml	BS_5l	POLIO	Meningitis	Yellow Fever	Measles
2012	13209877			5468889		liquid	lyophilized	lyophilized				1025086	6565308.79	11484666.9	
						20	10	10							
						5,395,800	**9,873,300**	**5,757,900**	**5,724,000**	**572,900**	**63,700**				
		2562716	9379013					Cons menA	**9 873,300**	**987,800**	**109,400**				
						bOPV1+3	**Measles**	**YF**	**SAB_0.5ml**	**Sdilution_5ml**	**BS_5l**				
2013	13566544	2631909		2893744	2170647	liquid	lyophilized	lyophilized				1052764		6076861.84	868258.786
						20	10	10							
						5,541,400	**2,285,800**	**3,040,100**	**3,040,100**	**304,200**	**33,700**				
								Cons measles	**2,285,800**	**229,200**	**26,000**				
						bOPV1+3	**YF**	**SAB_0.5ml**	**Sdilution_5ml**	**BS_5l**					
2014	13932840	2702971		2381122		liquid	lyophilized							5000357.02	
						20	10								
						5,691,000	**2,640,600**	**2,640,600**	**264,800**	**29,600**		1081188			
						bOPV1+3	**YF**	**SAB_0.5ml**	**Sdilution_5ml**	**BS_5l**					
2015	14309027	2775951		1847295		liquid	lyophilized								
						20	10								
						5,845,000	**2,109,300**	**2,109,300**	**211,500**	**23,800**		1110380		3879320.28	
						bOPV1+3									
2016	14695371	2850902				liquid									
						20									
						6,002,500						1140361			

Table IX: Vaccine and supplies forecast for vaccination campaigns

Year	Pop Tot	Target population				Additional vaccinations						Cost $			
		bOPV1+3	**Men_A**	**YF**	**Measles**	**bOPV1+3**	**Men_A**	**YF**	**SAB_0.5ml**	**Sdilution_5ml**	**BS_5l**	**POLIO**	**Meningitis**	**Yellow Fever**	**Measles**
						liquid	lyophilized	lyophilized							
2012	13209877					20	10	10							
				5468889		**5,395,800**	**9,873,300**	**5,757,900**	**5,724,000**	**572,900**	**63,700**	1025086.443	6565308.794	11484666.93	
		2562716	9379012,563			Cons menA			**9,873,300**	**987,800**	**109,400**				
						bOPV1+3	**Measles**	**YF**	**SAB_0.5ml**	**Sdilution_5ml**	**BS_5l**				
						liquid	lyophilized	lyophilized							
2013	13566544	2631909		2893744	2170647	20	10	10				1052763.777		6076861.841	868258.7855
						5,541,400	**2,285,800**	**3,040,100**	**3,040,100**	**304,200**	**33,700**				
						Cons measles			**2,285,800**	**229,200**	**26,000**				
						bOPV1+3	**YF**	**SAB_0.5ml**	**Sdilution_5ml**	**BS_5l**					
						liquid	lyophilized								
2014	13932840	2702971		2381122		20	10							5000357.019	
						5,691,000	**2,640,600**	**2,640,600**	**264,800**	**29,600**		1081188.399			
						bOPV1+3	**YF**	**SAB_0.5ml**	**Sdilution_5ml**	**BS_5l**					
						liquid	lyophilized								
2015	14309027	2775951		1847295		20	10								
						5,845,000	**2,109,300**	**2,109,300**	**211,500**	**23,800**		1110380.486		3879320.279	
						bOPV1+3									
						liquid									
2016	14695371	2850902				20									
						6,002,500						1140360.759			

VII. ANALYSIS OF COSTS AND FINANCING

VII.1 CURRENT SITUATION

Table X: Total EPI costs by type in 2010

		Expenditure	%
Cost category		**2010**	
Current recurrent costs		**US$**	
	Vaccines and injection equipment	$1978567	
	Traditional	$200,640	10%
	Under-used	$1,612,662	
	New		
	Injection materials	$165,265	
	Personnel	**$2,126,575**	**11%**
	Salaries of existing personnel (vaccination specific)	$576,607	
	Per-diem for advanced/mobile strategy	$1,008,108	
	Per-diem for surveillance and monitoring	$541,860	
	Transportation	**$106,265**	**1%**
	Fixed strategy and delivery of vaccines	$59,036	
	Advanced strategy	$35,422	
	Mobile strategy	$11,807	
	Maintenance and general	**$2,640,140**	
	Cold chain maintenance	$2,594,975	13%
	Maintenance of other equipment	$43,229	
	Buildings (electricity, water, etc.)	$1,935	
	Short-term training	$322,985	
	Social mobilization and IEC	$466,675	
	Monitoring and follow-up of diseases	$317,126	
	Program Management		
	Other recurrent costs	$6,004	
	Subtotal of recurring costs	**$7,964,336**	**41%**
Capital costs			
	Vehicles	$120,000	1%
	Cold chain equipment	$544,351	
	Other capital costs	$2,146	
	Subtotal of recurring costs	**$666,497**	**3%**
Vaccination campaigns			
	Polio	$5,752,283	
	Vaccines and injection material	$2,995,249	29%
	Operating costs	$2,757,034	
	Measles	$1,541,731	8%

		Expenditure	%
	Vaccines and injection material	$620,018	
	Operating costs	$921,713	
	Tetanus	$523,502	3%
	Vaccines and injection material	$454,283	
	Operating costs	$69,219	
	Subtotal campaign costs	**$7,817,516**	**40%**
Shared costs			
	Shared personnel costs	$2,885,786	
	Shared transport costs	$245,401	
	Buildings		
	Subtotal	**$3,131,186**	**16%**
GRAND TOTAL		**$19,579,536**	**100%**

The total cost of EPI and surveillance in 2010 is estimated at 9,118,385,711 FCFA (US$ 19,579,536). It can be broken down into four large categories: recurring costs, capital costs, campaign costs, and shared costs. The amount spent on campaign costs is justified by the number of significant campaigns organized in 2010 (1 round of Local Polio Days, 6 rounds of NVD polio, a measles follow-up campaign, a campaign against measles and another against tetanus). In contrast, the low amount of capital costs is linked to the fact that there was little investment in 2010 despite the need for equipment to be replaced.

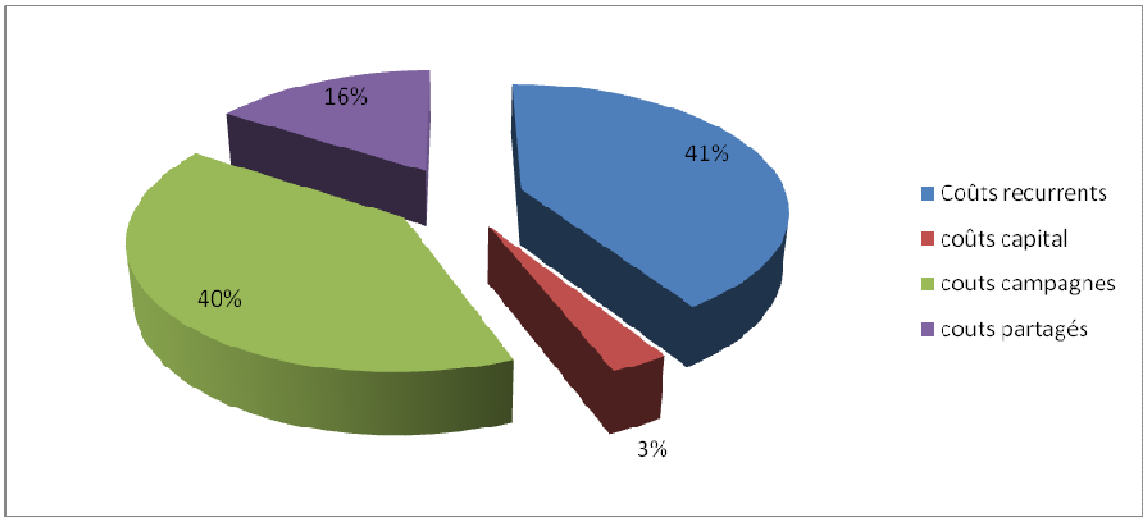


Figure 12: 2010 cost structure

Table XI: Division of recurring costs 2010

Current recurrent costs		US$	%
	Vaccines and injection equipment	**$1978567**	
	Traditional	$200,640	**25%**
	Under-used	$1,612,662	
	New		
	Injection materials	$165,265	
	Personnel	**$2,126,575**	
	Salaries of existing personnel (vaccination specific)	$576,607	**27%**
	Per-diem for advanced/mobile strategy	$1,008,108	
	Per-diem for surveillance and monitoring	$541,860	
	Transportation	**$106,265**	**1%**
	Fixed strategy and delivery of vaccines	$59,036	
	Advanced strategy	$35,422	
	Mobile strategy	$11,807	
	Maintenance and general	**$2,640,140**	**33%**
	Cold chain maintenance	$2,594,975	
	Maintenance of other equipment	$43,229	
	Buildings (electricity, water, etc.)	$1,935	
	Short-term training	$322,985	**4%**
	Social mobilization and IEC	$466,675	**6%**
	Monitoring and follow-up of diseases	$317,126	**4%**
	Other recurrent costs	$6,004	
	Subtotal of recurring costs	**$7,964,336**	**100%**

Expenses relative to maintenance of the cold chain, buildings and other equipment represent the largest portion of the recurring costs, 33%, as opposed to 27% for personnel, and 25% for vaccines and injection materials. The personnel expenses are made up of allowances transferred to healthcare agents for implementing advanced/mobile strategies and surveillance.

VII.1.2 DISTRIBUTION AND PROFILE OF EPI FINANCING IN 2010

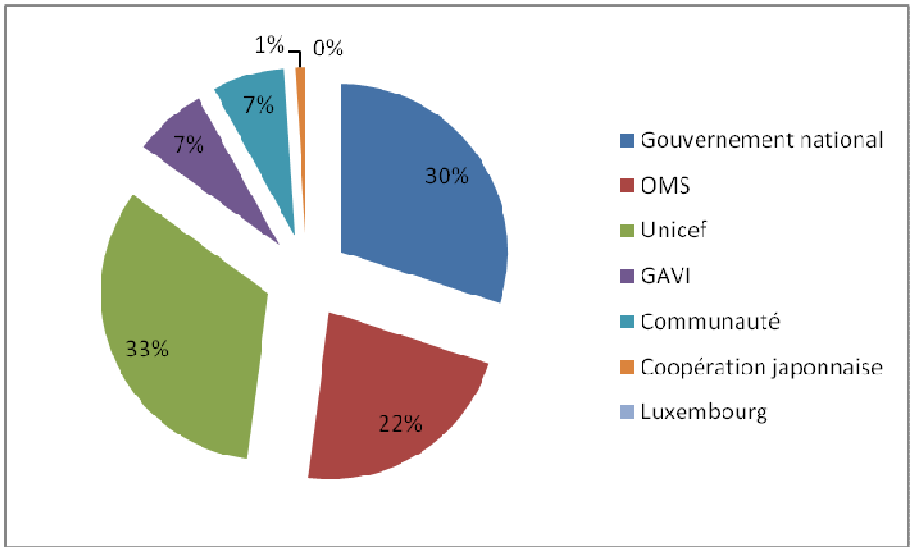


Figure 13: 2010 funding profile

In 2010, even though external funding represented the largest portion of the program (63%), national funding (governmental and community) remained higher if the different sources are looked at individually. The high amount of UNICEF/OMS funding is explained by the number of significant campaigns organized with the same year.

VII.2 EVOLUTION

VII.2.1. EVOLUTION OF DIFFERENT CATEGORIES OF COSTS

Costs over the duration of the plan are 207,012,833 $ (96,407,946,456 FCFA), which is an average of 41.4 $ million (19,281,589,291) per year. The program's global cost vary slightly over time; it will increase from 19. 5 $ million in 2010 to around 42.7 $ million in 2013. This increase is explained by the fact that most of the investments should be used during the first 2 years of the CMYP implementation, with, respectively, 666,497 $ and 1,713,288 $ in 2012 and 2013.

After 2012, the plan is to introduce the pneumococcus vaccine, and in 2013 to introduce the rotavirus vaccine. These introductions will engender higher costs, and, in particular, for the rotavirus.

The recurrent costs are more significant than the investment costs which do not reach 2 million $, even in 2013, the year during which the investments costs were the highest within the plan. The costs of new vaccines are ten times higher than those of traditional ones (65.6 million $ as opposed to 3.2 million $ million and 16.4 million $ for under-used vaccines.

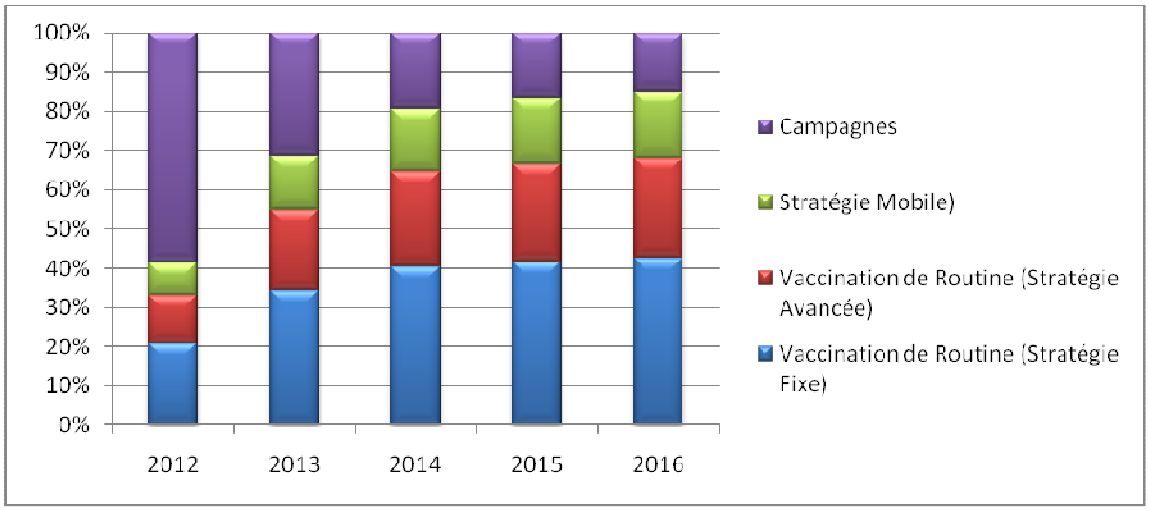


Figure 14: Breakdown of cost in function to vaccination strategy

In 2012, the campaign costs are higher; this is linked to the organization of the preventive campaign against yellow fever in the regions with have the highest population in the country and also the campaign against meningitis in 8 regions. The routine activities in the fixed strategy are less costly than those in the mobile and advanced strategies.

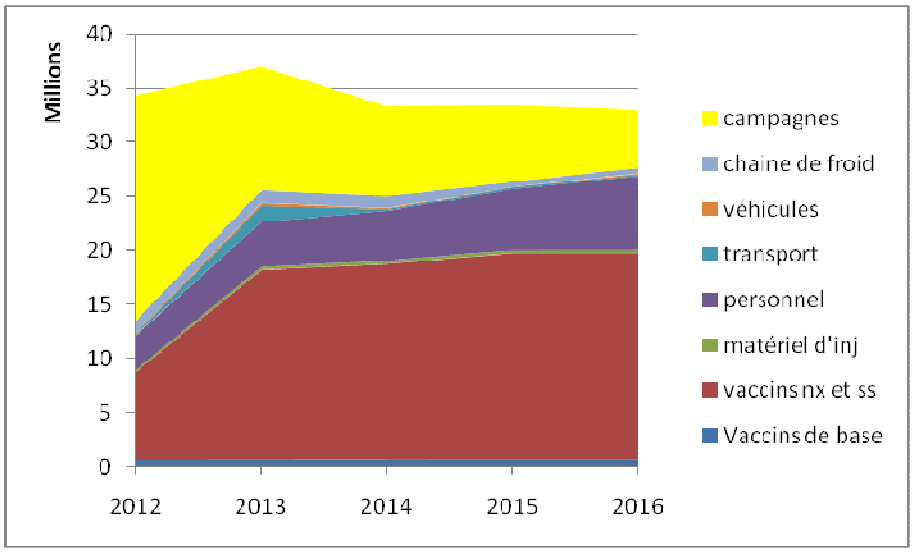


Figure 15: Breakdown in relation to expense stations

The first two components, vaccines and injection equipment and logistics (68%), along with improvements to immunisation services (29%), use almost all resources (more than 97%). The other components are less costly and account for less than 3%. These include program management (1%); lobbying and communication (1%) of the program and epidemiological supervision and monitoring (1%).

Shared costs (10% of the total) consist of personnel and transport expenses plus building costs. These costs are approximately 3.84 million $ per year. To be precise, it is personnel costs which are the more costly when compared to transportation costs; they increase regularly during the period, whereas building costs occur only during the plan's first two years of implementation.

VII.2.2 PLAN EVOLUTION AND FUNDING

Resource requirements are assessed at almost 207 million $ over the period covered by the plan. These needs will be 99% covered if the State maintains its commitments and if the partners confirm their funding intentions.

The changes to financing over the life of the plan is fairly constant, but fluctuates due to the magnitude of the investment at the start of the period and the introduction of vaccines during 2012 to 2013.

The funding structure shows that national funding (State, local collectives and communities) represent 25% of the plan's total funding. The structure of the funding reveals that the State finances 19% of the plan and takes complete charge for traditional vaccines, as well as part of the funding responsibility for new vaccines (co-funding), personnel salaries, construction, delivery of vaccines in the fixed strategy, and a good part of the capital investments. The largest part of the plan (75%) is financed by partners; this funding is intended for the purchase of new vaccines, supplies and also for the cost of operating the related campaigns.

The community supports the efforts of the State through the health committees, which contribute 5% of the total financing of the plan, thus assuring maintenance of the cold chain and maintenance of the buildings.

Financing from GAVI is very important; its share is approximately 30%. This takes into account new vaccines, the pentavalent and injection equipment as well as the meningitis vaccine and 50% of the operational costs for the preventive campaign for meningitis A in 2012.

WHO is contributing to financing the supervision, inspections and monitoring of diseases and, to a lesser extent, to short-term training.

UNICEF focuses on reinforcing vaccination services, and is also involved in funding operational costs and vaccines for the campaigns.

Funding from Japan, Luxembourg, the Word Blank, UNFPA and USAID is likely and will make up less than 1%.

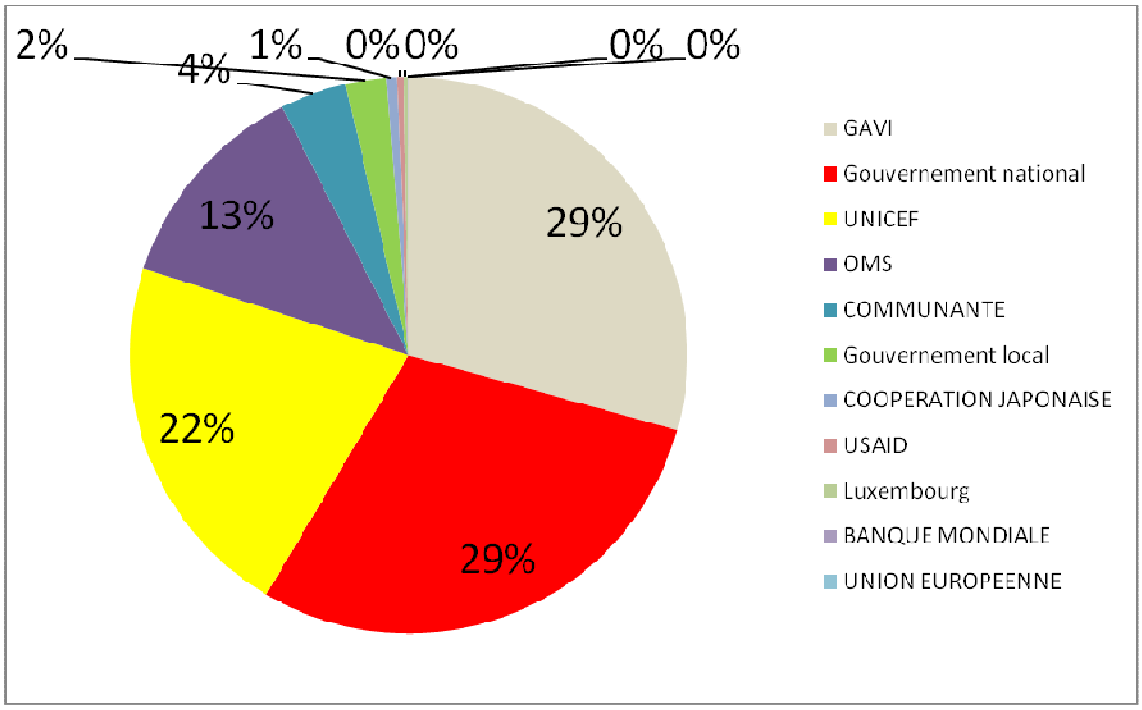
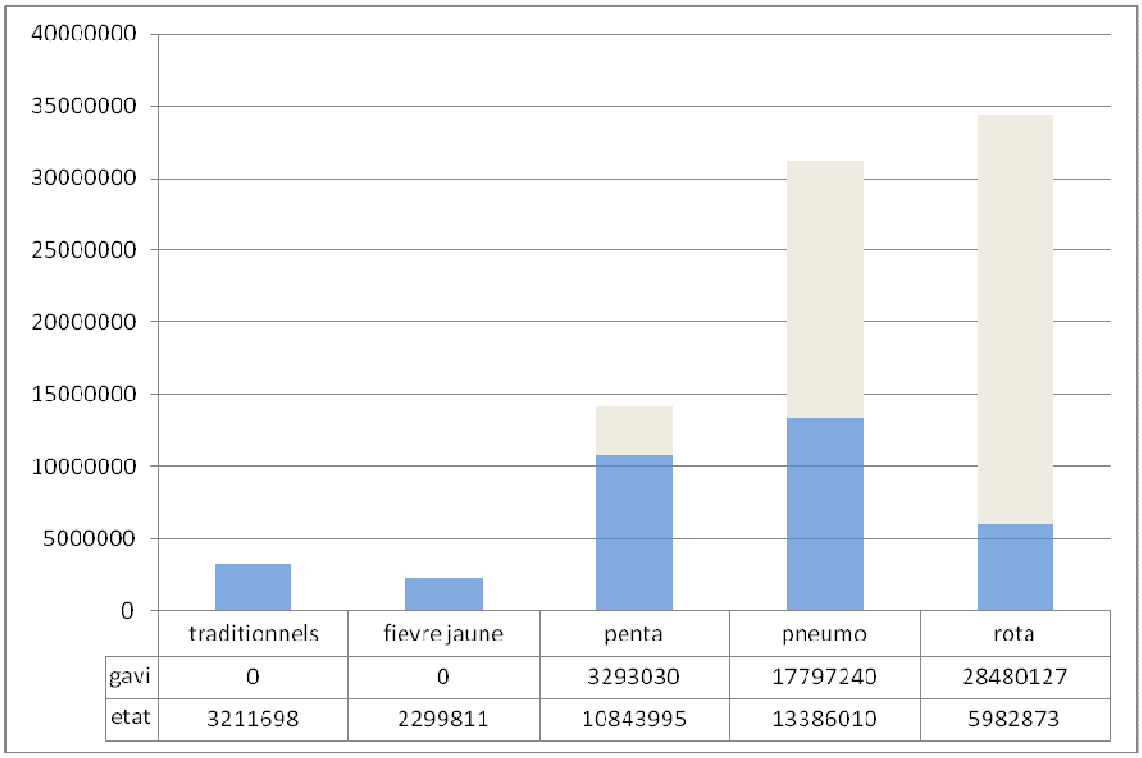


Figure 16: 2012-2016 funding profile

The routine vaccines together represent 64% of the recurring costs and 41% of the total budget for the 5 years of the CMYP. The new vaccines represent 77% of the total vaccine amount, close to half (49%) of recurring costs and a third (32%) of the total budget for the 5 years of the CMYP. In 2012, the pneumococcus vaccine represents $5,193,825 or 59% for the purchase of vaccines and $45,176 or 18% for the injection equipment. Out of the $4,636,631 funded by the State for recurring costs, $1,038,765 or 22% goes to purchasing the pneumococcus vaccine.

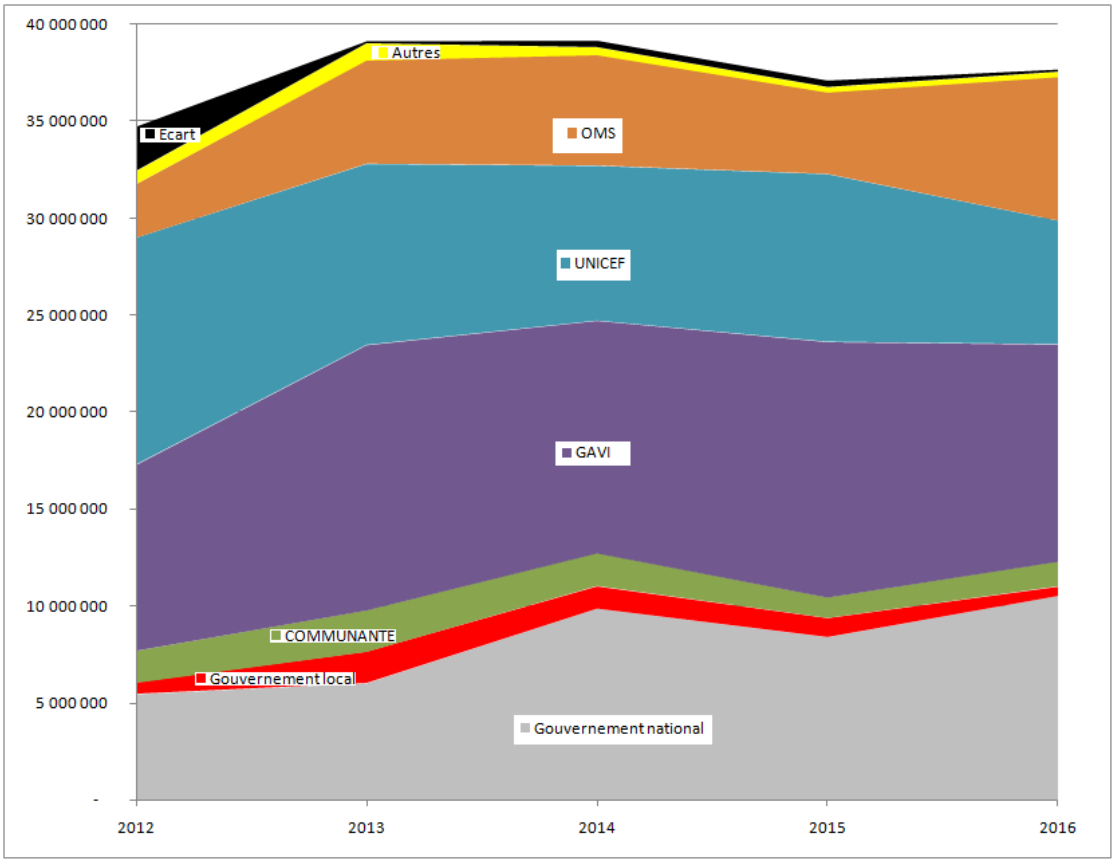


	traditionnels	fievre jaune	penta	pneumo	rota
gavi	0	0	3293030	17797240	28480127
etat	3211698	2299811	10843995	13386010	5982873

Figure 17: Evolution of vaccine co-funding

Table XII: Breakdown of funding gaps including assured and likely funding

	2012	2013	2014	2015	2016	TOTAL	%
Vaccines and injection supplies	0	0	0	0	0	**0**	0%
Personnel	0	0	0	0	0	**0**	0%
Transportation	0	0	0	0	0	**0**	0%
Activities and other recurring costs	57,619	6,575	0	325,141	0	**389,336**	27 %
Logistics (vehicles, cold chain, etc.)	483,784	84,737	330,088	0	121 111	**1 019 720**	70 %
Vaccination campaign	42,021	0	0	0	0	**42 021**	3%
TOTAL	**583,425**	**91,313**	**330,089**	**325,141**	**121,110**	**1,451,077**	
%	**40%**	**6%**	**23%**	**22%**	**8%**		



*Autres: Japon, Luxembourg, US AID, Union Européenne, Banque Mondiale

Figure 18: Projection of assured and likely funding for 2012 to 2016

Funding of vaccines and immunisation equipment is ensured for the duration of the 2012-2016 plan. Funding for purchase of the pneumococcus vaccine and injection equipment is fully covered by GAVI and the State (co-funded) for the 5 years of the multi-year plan. In addition, there is not a gap in funding and inventory capacity of vaccines is ensure through 2016. Considering assured and likely funding, the global gap for the period is $1,451,077. The funding gap is mainly related to logistics (70%) and other recurring costs (27%). The composition of this gap shows that it does not compromise the actual implementation of the program.

Where logistics are concerned, it has mainly to do with the construction and maintenance of incinerators. The waste management plan is for districts who do not have incinerators to use hospital incinerators while waiting for incinerators to be built.

For other recurring costs, the training that is scheduled for 2015 makes up 84% of the gap. This training does not include training that is to be organized for the introduction of new vaccines. The training that addresses the various EPI issues could be used in place of the general training planned for 2015.

VII.3 ANALYSIS AND STRATEGIES FOR GAP REDUCTION

The composition of the financial differences reveals a financing gap of some $1.4 million, not including shared costs but taking into account likely funding. Vaccines will be covered mainly by GAVI and the State. However, the costs related to the purchase of logistics (CDF and logistics on wheels) which are often covered by the State, and usually by the partners, will create the largest gap, around $1.09 million. To reduce this gap; the State must increase the overall budget for logistics (vehicles, cold chain) and convince other partners to invest more.

For recurring costs, the gap is around $389,336, or less than $77.8 thousand per year on average. This small gap is linked to the fact that these activities are usually financed by partners such as WHO and UNICEF.

The gap for immunisation campaigns is $28.5 million for the entire plan period. This gap almost disappears ($42,021) if likely funding is taken into account. The strategy which must be employed to buffer this deficit is to defend the program to probable funding sources such as Japan and Luxembourg.

Overall, the EPI is financially viable. Future resource needs vary from 7.4% to 9.5% of the total healthcare expenditures. The funding gap remains at less than 0.4% of total healthcare expenditures except for in 2012 when the gap is estimated at 0.6%. Healthcare expenses are, on average, $54.72 per person for the life of the plan. EPI resource needs per person will be $2.7 and do not even represent 0.18% of the country's GDP.

We have identified the following strategies to reinforce the program's sustainability:

- Real annual increase in the "vaccines and supplies" budget line item staring in 2012, and that funds related to this line item be releases in a timely manner

- The use of a part of the budget coming from BCI-State for vaccinations;
- Making available to EPI additional resources that come from the increase of the health budget, which will be increased to 15% of the State's operating budget, in conformity with the recommendations made by the summit of heads of state of the CEDEAO in 2001 (currently 8%) for EPI;
- Use of resources coming from PPTE funds (resources linked to lower debt) through the execution of the DPES;
- Targeting EPI as part of budgetary support;
- Appealing for financial participation of the local collectives in the financing of the program under the transfer of authority involved in decentralisation. statutes and rules envisage a budgetary amount 8% for healthcare, but currently the local collectives rarely reach 4%;
- Involvement of the private sector in EPI financing;
- Seeking alternative sources of financing from GAVI;

VII. FOLLOW-UP-EVALUATION PLAN

Based on program indicators, the objectives are to be measured starting with sources of information and means of verification which have been identified to ensure that the planned activities are, in fact completed, and that the objectives are obtained.

- At the vaccination unit level, a monthly report will be created and an analysis will be completed and shown on the auto-monitoring curve
- At the district level, a monthly report will be created after compiling and analysing the vaccination unit reports using past information during the monthly coordination meetings.
- National level
    - The monthly reports provided to the districts will be compiled and analysed and brochure produced that contains past information. An ICC technical meeting will be held every month.
    - An EPI monitoring and surveillance meeting that brings all the participants together (national, regional, district levels and partners) will be held every three months.
    - Each year, the results meetings for the EPI annual plan and surveillance will be organized with all participants.
    - An annual CMYP update and PTA draft
    - An internal review half-way through the duration of the CMYP that will address immunisation coverage will be organized in 2014
    - An external review at the end of the plan will address immunisation coverage.

Table XIII: CMYP Follow-up indicators

Objectives	Indicators			Annualised objectives				
	Description	Current level	Target	2012	2013	2014	2015	2016
To reach vaccine coverage of at least 95% for BCG, Penta3, pneumo3 and Rota2 for infants age 0 to 11 months, nationally	CV BCG	80%	95%	90%	95%	95%	95%	95%
	CV Penta 3	70%	95%	90%	95%	95%	95%	95%
	CV Pneumo3		95%	90%	95%	95%	95%	95%
	CV Rota2		95%		90%	95%	95%	95%
To reach vaccine coverage of at	CV VAR	60%	90%	80%	85%	90%	90%	90%

Objectives	Indicators			Annualised objectives				
	Description	Current level	Target	2012	2013	2014	2015	2016
least 90% for for MCV and AAV for infants age 0 to 11 month, nationally	CV VAA	60%	90%	80%	85%	90%	90%	90%
To reach vaccine coverage of at least 90% for VAT infants pregnant women, nationally	CV VAT 2+	60%	90%	80%	85%	90%	90%	90%
To reach vaccine coverage of at least 90% in all districts for BCG, Penta3, pneumo3 and Rota2 for infants age 0 to 11 months	% of HD reaching 90 % DE coverage for BCG, Penta3, pneumo3 and Rota2	71%	80%	85%	90%	95%	100 %	100 %
To reach vaccine coverage of at least 90% in all districts for MCV and AAV in infants age 0 to 11 months	Number of HD reaching 90% of coverage for MCV and AAV	58%	80%	85%	90%	95%	100 %	100 %
Reach at least 90% of vaccine coverage for VAT for pregnant women in every district	Number of HD reaching 90% of coverage for VAT2	46%	80%	85%	90%	95%	100 %	100 %
To maintain the interruption of circulation of WPV	Rate of non-polio PFA per 100,000 children under 15 years old	3	3	3	3	3	3	3
	Number of regions having the two major indicators	11	14	14	14	14	14	14
	% of adequate stool samples	93	95	95	95	95	95	95
	Number of confirmed cases of WPV	0	0	0	0	0	0	0
To interrupt the circulation of the morbillous virus	Number of HD reporting at least one suspected case of measles during the year	64	75	75	75	75	75	75
	Annual rate of investigation of suspected cases of measles	100%	100%	100 %	100 %	100 %	100 %	100 %
	Number of confirmed cases of measles	909	0	0	0	0	0	0

Objectives	Indicators			Annualised objectives				
	Description	Current level	Target	2012	2013	2014	2015	2016
To eliminate maternal and neonatal tetanus	Rate of incidence of neonatal tetanus	< 1 /1000NV	< 1 /1000 NV	< 1 /1000NV	< 1 /1000NV	< 1 /1000NV	< 1 /1000NV	< 1 /1000NV
	Number of high-risk districts	0	0	0	0	0	0	0
Ensure the prevention of yellow fever epidemics	Number of HD reporting at least one suspected case of yellow fever	49/65	75	75	75	75	75	75
To ensure vaccination independence through the national budget	State's funding portion for traditional and new vaccines	27%	53%	32%	26%	44%	48%	53%

ANNEXES

EPI cost structure for 2012 to 2016

	2012	2013	2014	2015	2016	Total 2012 - 2016	% of general total
	US$	US$	US$	US$	US$	US$	
Base vaccine	**8,754,489**	**18,229,103**	**18,767,313**	**19,758,514**	**19,785,365**	**85,294,784**	**41%**
Traditional	$575 047	$624 822	$655 221	$672 933	$683 675	$3 211 698	2%
Under-used	$2 985 617	$3 097 581	$3 359 817	$3 449 806	$3 544 015	$16 436 836	8%
New	$5 193 825	$14 506 700	$14 752 275	$15 635 775	$15 557 675	$65 646 250	32%
Injection materials	$250 256	$271 271	$286 214	$293 928	$304 917	$1 406 586	1%
Personnel	$3 166 022	$4 127 648	$5 205 938	$6 244 654	$7 402 331	$26 146 593	**13%**
Personnel salaries	$600 567	$612 578	$624 830	$637 326	$650 073	$3 125 374	**2%**
Per-diem for advanced/mobile strategy	$1 894 275	$2 815 485	$3 772 785	$4 767 252	$5 799 988	$19 049 785	**9%**
Per-diem for surveillance and monitoring	$671 180	$699 586	$808 322	$840 076	$952 270	$3 971 434	**2%**
Transportation	$122 009	$149 452	$163 776	$120 805	$137 963	$694 005	**0%**
Fixed strategy	$67 783	$83 029	$90 987	$67 114	$76 646	$385 558	**0%**
Advanced strategy	$40 670	$49 817	$54 592	$40 268	$45 988	$231 335	**0%**
Mobile strategy	$13 557	$16 606	$18 197	$13 423	$15 329	$77 112	**0%**
Maintenance and general	$3 074 677	$3 681 424	$4 306 791	$1 784 571	$2 024 452	$14 871 915	**7%**
Cold chain maintenance	$2 993 211	$3 578 620	$4 182 908	$1 638 807	$1 856 331	$14 249 877	**7%**
Maintenance of other equipment	$79 492	$100 791	$121 829	$143 669	$165 985	$611 766	**0%**
Buildings (electricity, water, etc.)	$1 974	$2 013	$2 053	$2 095	$2 136	$10 271	**0%**
Short-term training	$351 423	$380 870	$410 870	$325 511	$321 611	$1 790 284	**1%**
Social mobilization and IEC	$299 830	$362 184	$371 709	$379 143	$386 726	$1 799 593	**1%**
Monitoring and follow-up of diseases	$339 539	$362 931	$372 007	$429 084	$455 172	$1 958 733	**1%**
Program Management	$0	$0	$0	$0	$0	$0	**0%**
Other recurrent costs	$6 280	$6 575	$6 862	$7 147	$7 434	$34 298	**0%**
Subtotal of recurring costs	**$16 364 524**	**$27 571 459**	**$29 891 480**	**$29 343 357**	**$30 825 970**	**$133 996 791**	**65%**
						$0	**0%**
Vehicles	$142 800	$249 696	$127 345	$0	$154 571	$674 412	**0%**
Cold chain equipment	$1 128 604	$1 210 501	$1 131 580	$489 662	$508 221	$4 468 569	**2%**
Other capital costs	$441 884	$227 762	$230 836	$235 453	$239 805	$1 375 741	**1%**
Subtotal capital costs	**$1 713 288**	**$1 687 960**	**$1 489 761**	**$725 115**	**$902 598**	**$6 518 722**	**3%**
						$0	**0%**
Polio campaign	$3 095 767	$3 311 689	$3 565 999	$3 676 100	$3 749 419	$17 398 974	**8%**
Vaccines and injection material	$1 025 086	$1 052 764	$1 081 182	$1 110 350	$1 140 361	$5 409 743	**3%**

	2012	2013	2014	2015	2016	Total 2012 - 2016	% of general total
Operating costs	$2 070 681	$2 258 925	$2 484 817	$2 565 750	$2 609 058	$11 989 231	6%
Measles campaign	$0	$1 669 968	$0	$0	$2 197 457	$3 867 425	2%
Vaccines and injection material	$0	$766 023	$0	$0	$972 415	$1 738 438	1%
Operating costs	$0	$903 945	$0	$0	$1 225 042	$2 128 987	1%
Meningitis campaign	$4 264 780	$0	$0	$0	$0	$4 264 780	2%
Vaccines and injection material	$2 764 209	$0	$0	$0	$0	$2 764 209	1%
Operating costs	$1 500 571	$0	$0	$0	$0	$1 500 571	1%
Yellow Fever campaign	$9 276 369	$4 899 194	$4 225 973	$3 363 530	$0	$21 765 066	11%
Vaccines and injection material	$8 061 060	$4 256 140	$3 696 840	$2 953 020	$0	$18 967 060	9%
Operating costs	$1 215 309	$643 054	$529 133	$410 510	$0	$2 798 006	1%
Subtotal campaign costs	**$16 636 916**	**$9 880 851**	**$7 791 972**	**$7 039 630**	**$5 946 876**	**$47 296 245**	23%
						$0	0%
Shared personnel costs	$3 157 838	$3 304 821	$3 558 805	$3 714 408	$3 984 175	$17 720 047	9%
Shared transport costs	$250 309	$255 315	$260 421	$265 629	$270 942	$1 302 616	1%
Buildings	$178 413	$0	$0	$0	$0	$178 413	0%
Subtotal	**$3 586 559**	**$3 560 136**	**$3 819 226**	**$3 980 037**	**$4 255 117**	**$19 201 075**	9%
	$38 301 288	**$42 700 406**	**$42 992 440**	**$41 088 139**	**$41 930 561**	**$207 012 833**	100%
Routine vaccination	**$21 664 372**	**$32 819 555**	**$35 200 468**	**$34 048 509**	**$35 983 685**	**$159 716 588**	
Vaccination campaigns	**$16 636 916**	**$9 880 851**	**$7 791 972**	**$7 039 630**	**$5 946 876**	**$47 296 245**	

CMYP Updated Baseline and Annual Targets

Number	Baseline year	Baseline and targets					
	2010	2012	2013	2014	2015	2016	
	475 815	501 856	515 406	529 322	543 614	558 296	
Total number of infant deaths	29 025	30 613	31 440	32 289	33 160	34 056	
Total number of surviving infants	446,790	471,243	483,966	497,033	510,454	524,240	
Total number of pregnant women	475 815	501 856	515 406	529 322	543 614	558 296	
Number of vaccinated infants (or to be vaccinated) with BCG	193 197	451 670	489 636	502 856	516 433	530 377	
BCG Coverage (%)[1]	41%	90%	95%	95%	95%	95%	
Number of vaccinated infants (or to be vaccinated) with three doses of OPV	196 580	451 670	489 636	502 856	516 433	530 377	
OPV3 Coverage (%)[2]	44%	96%	101%	101%	101%	101%	
Number of vaccinated infants (or to be vaccinated) with the first dose of DTC[3]	196 958	424 118	459 768	472 182	484 931	498 024	
Number of vaccinated infants (or to be vaccinated) with three doses of DTC[3]	196 070	424 118	459 768	472 182	484 931	498 024	
DTC3 coverage (%)[2]	44%	90%	95%	95%	95%	95%	
Loss rate[1] for base line year and forecast for the following year for DTC (%)	5%	5%	5%	5%	5%	5%	
Loss rate[1] for base line year and forecast for the following year for DTC (%)	1,05	1,05	1,05	1,05	1,05	1,05	
Target population vaccinated with the first dose of Pneumococcal vaccine		424 118	459 768	472 182	484 931	499 024	
Target population vaccinated with the third dose of pneumococcal vaccine		424 118	459 768	472 182	484 931	499 024	
Pneumococcal Coverage (%)[2]	0%	90%	95%	95%	95%	95%	
Number of vaccinated infants (or to be vaccinated) with the first dose the measles vaccine	147 855	376 994	411 371	447 330	459 408	471 812	
Measles vaccine	33%	80%	85%	90%	90%	90%	

Number	Baseline year	Baseline and targets					
	2010	2012	2013	2014	2015	2016	
coverage(%)[2]							
Pregnant women vaccinated with AT +	157 248	401 485	438 095	476 390	489 252	502 462	
AT+ coverage(%)[4]	33%	80%	85%	90%	90%	90%	
Annual drop-out rate for DTC[(DTC1 - DTC3) / DTC1] x 100[5]	0%	0%	0%	0%	0%	0%	

SUMMARY OF THE CURRENT AND FUTURE VACCINATION BUDGET

Budget Line Item	Baseline year	Year 1	Year 2	Year 3	Year 4	Year 5
	2010	2012	2013	2014	2015	2016
Vaccines (only systematic vaccines)	**1 813 302**	**8 754 489**	**18 229 103**	**18 967 313**	**19 758 514**	**19 785 365**
Traditional vaccines	1 813 302	3 560 664	3 722 403	4 215 038	4 122 739	4 227 690
New and Under-used Vaccines		5 193 825	14 506 700	14 752 275	15 635 775	15 557 675
Injection equipment	165 265	250 256	271 271	286 214	293 928	304 917
Personnel	**1 584 715**	**2 494 842**	**3 428 063**	**4 397 615**	**5 404 578**	**6 449 961**
Salaries for PNV healthcare agents employed full time (only working on vaccinations)	576 607	600 567	612 578	624 830	637 326	650 073
Daily costs for mobile/proximity vaccination teams	1 008 108	1 894 275	2 815 485	3 772 785	4 767 252	5 799 888
Transportation	106 265	122 009	149 452	163 727	120 805	137 963
Maintenance and overhead	2 640 140	3 074 677	3 681 424	4 306 791	1 784 571	2 024 452
Training	322 985	351 423	380 870	410 870	325 511	321 611
Social mobilization and IEC	466 675	299 830	362 184	371 709	379 143	386 726
Disease surveillance	317 126	339 539	362 931	372 007	429 084	451 172
Program Management						
Other recurrent costs	6 004	6 280	6 575	6 862	7 147	7 434
Subtotal of recurring costs	***7 422 477***	***15 693 345***	***26 871 873***	***29 283 108***	***28 503 281***	***29 869 601***
Vehicles	120 000	142 800	249 696	127 345		154 571
Cold chain equipment	544 351	1 228 604	1 210 501	1 131 580	489 662	508 221
Other capital costs	2 146	441 884	227 762	230 836	235 453	239 805
Subtotal Equipment Costs	***666 497***	***1 813 288***	***1 687 959***	***1 489 761***	***725 115***	***902 597***
Polio	5 752 283	3 095 767	3 311 689	3 565 999	3 676 100	3 749 419
Measles	1 541 731		1 669 968			2 197 457