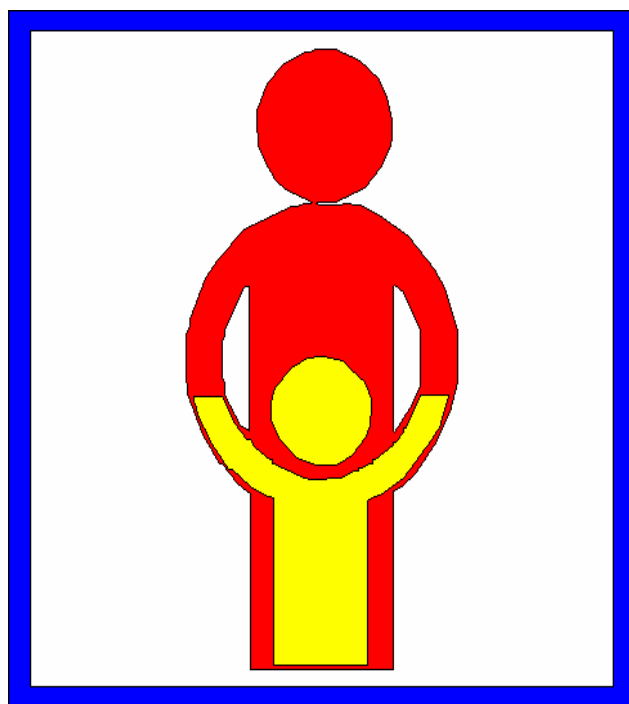




Gobierno de Reconciliación
y Unidad Nacional

El Pueblo, Presidente!



Comprehensive Multi-Year Plan for the National Immunization Programme 2007– 2011

Revised in August 2007

TABLE OF CONTENTS

INTRODUCTION.....	5
NIP OVERALL AND SPECIFIC OBJECTIVES.....	7
SITUATIONAL ANALYSIS OF THE NATIONAL IMMUNISATION PROGRAMME.....	8
FINANCING AND MOBILISATION OF FINANCIAL RESOURCES during 2002 – 2006.....	18
STRENGTHS AND WEAKNESSES OF THE NATIONAL IMMUNISATION PROGRAMM.....	22
STRATEGIC AREAS FOR ACTION IN THE 2007-2011 PERIOD.....	27
COST AND FINANCING 2007 – 2011.....	32
FINANCIAL SUSTAINABILITY STRATEGIES.....	38
ANNEX.....	39

ACRONYMS AND ABBREVIATIONS

AFP:	Acute Flaccid Paralysis
CELADE:	Latin American and Caribbean Demographic Centre
CENABI:	National Vaccine Centre
CNDR:	National Diagnostic and Reference Centre
DHS:	Nicaraguan Demographic and Health Survey
dT	Adult Diphtheria and Tetanus Toxoid
ERCERP:	Enhanced Economic Growth and Poverty Reduction Strategy
FONSALUD:	National Health Funds
IEC:	Information, Education and Communication
INIDE:	National Institute for Development Information
JPV:	Massive Vaccination Campaign
MMR:	Measles, Mumps and Rubella (Triple Viral Vaccine)
MINSA:	Ministry of Health
NIP:	National Immunisation Programme
NGO:	Non-governmental Organisation
PAHO:	Pan-American Health Organisation
SILAIS:	Local Integrated Health Care System
UNICEF:	United Nations Children's Fund
USAID:	United States Agency for International Development
VPD:	Vaccine-Preventable Diseases
WCBA:	Women of Childbearing Age
WHO:	World Health Organisation

**PARTICIPANTS IN THE PREPARATION OF THE
NIP FIVE-YEAR PLAN
2007 – 2011**

Below is a list of those that participated in the various phases of preparation and review of the National Immunisation Five-year Plan for 2007 - 2011, during the period from October to December 2006 with a review in August 2007.

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1. INTRODUCTION

In 1977, the Pan-American Health Organisation (PAHO/WHO) began to foster the formation of the Expanded Programme on Immunisation (EPI) in the countries of the Americas.

Implementation of routine vaccination services started in Nicaragua around 1960, generally vaccinating on demand in the health units that existed at the time. In 1980, the government formed the National Immunisation Programme (NIP), developing diverse vaccination strategies to provide extensive delivery of vaccines to the target population.

The **Mission** of the National Immunisation Programme is “to be the specialised agency of the Ministry of Health for the control and elimination of vaccine-preventable diseases, responsible for the development and fulfilment of plans to ensure the prevention, control, elimination and/or eradication of vaccine-preventable diseases”. Its **Vision** is “to determine the steps to be followed for effective, sustainable and equitable delivery of high quality immunisation services, within a framework of comprehensive care”.

At the national level, the NIP is under the General Bureau of Health Surveillance and has a coordinator and a technical and administrative support team. In addition to all aspects of the vaccination component, the programme also directs the National Vaccine Centre, responsible for the conservation, management and distribution of vaccines from their arrival in the country through their delivery to the Local Integrated Health Care Systems (SILAIS).

In December 2006, the epidemiological surveillance component of the NIP was transferred to the Bureau of Public Health Surveillance. This bureau is responsible for the surveillance of all other events that affect health.

The National Diagnostic and Reference Centre (CNDR) is the reference site for the laboratory diagnosis of vaccine-preventable diseases (VPD) through the Virology and Bacteriology Departments.

There is a person in each SILAIS and municipality that is responsible for the NIP, working in coordination with the person responsible for epidemiology and epidemiological surveillance.

In the 17 SILAIS in the country, there is a network of health units comprised of 23 health centres with beds, 138 health centres without beds and 819 health posts, for a total of 980 health services that offer all the vaccines in the basic national vaccination schedule, systematically and free of charge to the entire target population, operating during all business days. BCG vaccine is assured for all newborns in the hospitals that offer maternal and infant care.

That is, in its current form the National Immunisation Programme is tightly integrated into the overall system of health care provision in the country.

Since its inception, the NIP has implemented **different strategies** in order to achieve the vaccination coverage recommended to protect the population from VPD. These include routine vaccination, massive vaccination campaigns, school vaccination and follow-up campaigns which are implemented through various tactics: vaccination posts, vaccination within institutions, house-to-house visits and brigades to penetrate areas that are difficult to access. The latter have been strengthened by the implementation of the **Coverage Extension Strategy**, developed by the Ministry of Health and directed at the territories that are difficult to access and the populations that have been missed.

Massive Vaccination Campaign (JPV): Every year since 1980, a JPV is conducted in the months of April and May, contributing significantly to achieving adequate vaccination coverage. In addition to vaccination, vitamin A is administered to children under five years old and parasite treatment is provided for children between two and 12 years old during these campaigns. Overall, 95% of targets established for these campaigns are fulfilled. This achievement has played and continues to play a central role in the eradication of poliomyelitis and in the elimination of measles, rubella, congenital rubella syndrome (CRS) and neonatal tetanus.

Follow-up Campaigns: Every four years since 1996, as part of the JPV, follow-up campaigns against measles are directed at all children from one to four years old in order to consolidate the elimination of measles. These campaigns have been successful, achieving coverage of more than 95% vaccinated. Beginning next year, the consolidation of the elimination of rubella and of congenital rubella syndrome will be added to the achievements of these follow-up campaigns.

School Vaccination: Vaccinations are administered annually against diphtheria, tetanus, hepatitis B and other diseases in order to protect the school-age population.

National Vaccination Campaign against Rubella: This campaign was implemented in Nicaragua during October and November 2005, directed at men and women from six to 39 years old, in order to eliminate rubella and congenital rubella syndrome and to consolidate the eradication of measles. This campaign achieved the vaccination coverage targets of 95% in all age groups.

2. NIP OVERALL AND SPECIFIC OBJECTIVES

The **overall objective** of the programme is to reduce the risk of disease and death from vaccine-preventable diseases through the universal application of vaccination and the epidemiological surveillance of those diseases.

The **specific objectives** of the NIP include:

- 1) Reach and maintain vaccination coverage equal to or greater than 95% in all the municipalities of the country, in the age group under one year old, with all vaccines except the MMR, which must be applied once the child is one year old.
- 2) Maintain the eradication of poliomyelitis, the elimination of measles and of neonatal tetanus, and consolidate the elimination of rubella and of congenital rubella syndrome.
- 3) Ensure the delivery of quality immunisation services in a systematic and effective fashion within the framework of comprehensive care.
- 4) **Build up** and maintain an epidemiological surveillance system with the capacity to adequately detect and investigate any suspected VPD case and to immediately implement the proper response measures.
- 5) Comply with the standards for safe vaccination practices, which include quality of vaccine and supplies, cold chain, proper vaccination techniques and proper disposal of waste.
- 6) Promote self-sufficiency in the supply of services for immunisation.
- 7) Fulfil the requirements for the safe introduction of new vaccines.
- 8) Promote broad inter-sectoral, intra-sectoral, inter-programmatic and community participation to ensure that the proposed objectives are achieved.
- 9) Develop and maintain technical and management skills (competencies and abilities) among the personnel that work with the immunisation program, in order to improve their performance and achieve the programme objectives.
- 10) Enhance the quality of information and strengthen the capacity for analysis and use of information to focus actions on at-risk areas.

3. SITUATIONAL ANALYSIS OF THE NATIONAL IMMUNISATION PROGRAMME

3.1 Vaccination Schedule: the following table provides details on the national vaccination schedule in effect throughout the country.

Table 1. National Vaccination Schedule for Nicaragua

Vaccines	Disease Prevented	Vaccination Age	Number of Doses	Booster Dose
BCG	Severe Forms of Tuberculosis	Newborn	1 Dose	None
Oral Poliomyelitis Vaccine (OPV)	Poliomyelitis	2, 4, 6 months	3 Doses	An additional dose during each JPV for children from 2 months to 4 years
Pentavalent DTP/HB+Hib	Diphtheria, Tetanus, Pertussis. Hepatitis B, Meningitis and Pneumonia caused by Haemophilus Influenzae Type B	2, 4, 6 months	3 Doses	None
Rotavirus	Severe Diarrhoea due to Rotavirus	2, 4, 6 months	3 Doses	None
DTP	Diphtheria, Tetanus, Pertussis	18 months (One year from the third dose of Pentavalent)	1 Dose	None
MMR	Measles, Mumps, Rubella	12 months	1 Dose	One dose of MR in the Follow-up Campaigns (held every four years) for Children 1 to 4 years old
dT	Tetanus	6 to 9 years	1 Dose	If there is no record of having received Pentavalent, DTP or dT, 2 nd dose is applied at 8 weeks interval, 3 rd dose at 6 months, 4 th dose in one year after the 3 rd , and 5 th dose in one year after the 4 th .
	Diphtheria, Tetanus	= 10 years	1 Dose	
Influenza	Paediatric Seasonal Flu	6 to 23 months with chronic illnesses	2 doses when applied for the first time	Annual Vaccination
	Adult Seasonal Flu	= 65 years with chronic illnesses	10 doses	Annual Vaccination

3.2 VACCINATION COVERAGE:

In the period from **1997 to 2000**, national vaccination coverage of children under one year old with BCG, OPV and Pentavalent, and of the one-year-old population with MMR were generally over 90%, presenting a gradual increase until 2000. However, this progressive increase was interrupted in **2001** with the beginning of a decrease in coverage that extended until 2004. This trend is more evident in the observation of the behaviour of the number of doses applied

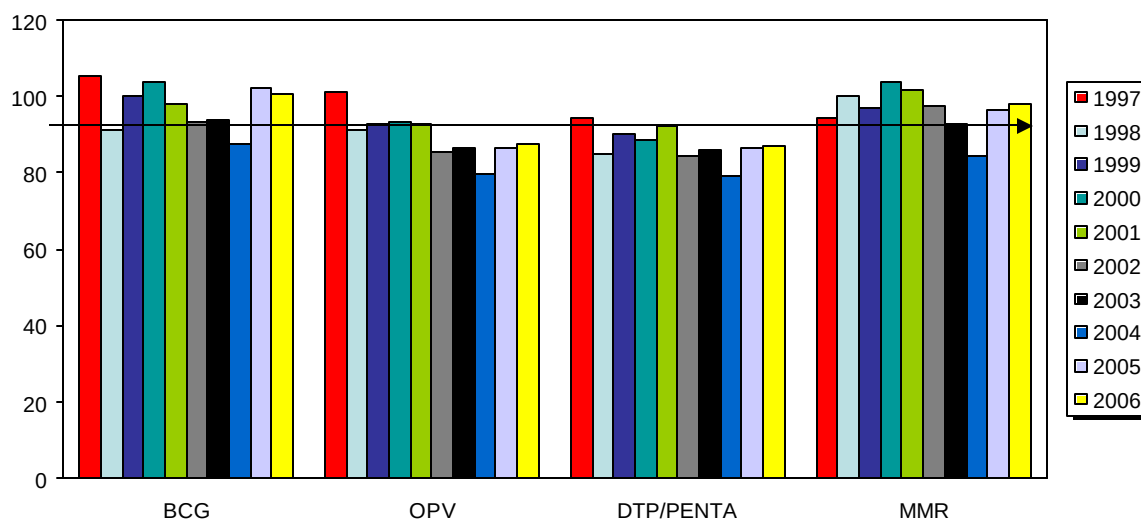
During the period from 1997 to 2000, the NIP had significant support from USAID and UNICEF, as well as resources from the Supplementary Social Fund to strengthen the management of the programme, contributing to an ongoing programme of technical support, supervision, monitoring and evaluation.

In the period from 2001 to 2004, vaccination coverage remained greater than 85% for all vaccines except OPV (80%) and Pentavalent (79.4%) in 2004, the year with the lowest coverage in the period.

Beginning in 2005, there was an increase in coverage of the various vaccines. This was maintained in 2006, except for BCG, which experienced a slight decrease.

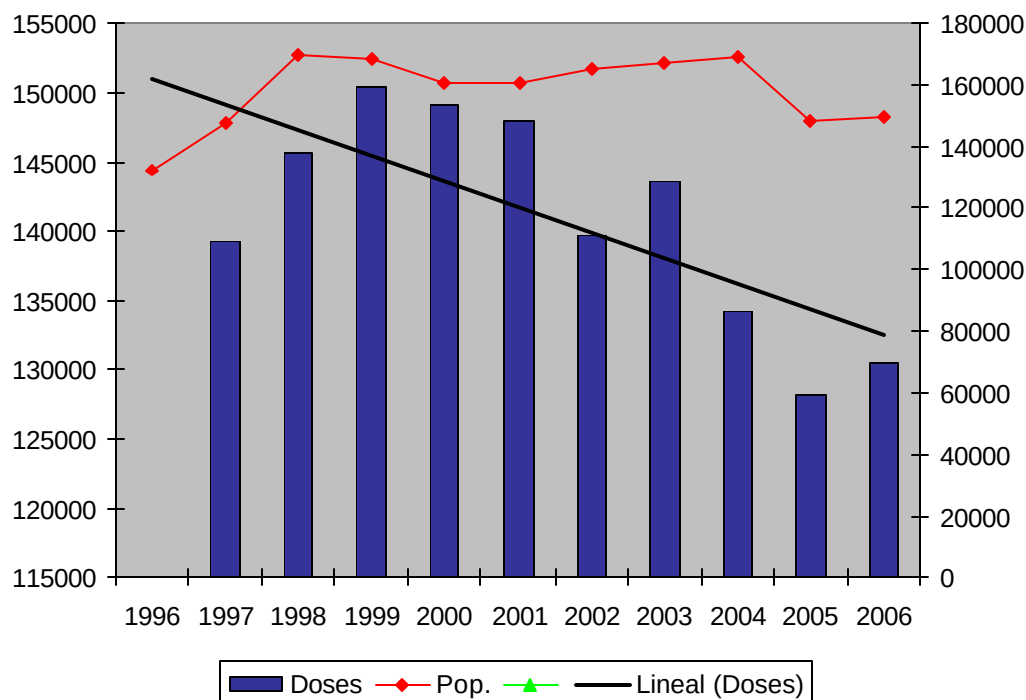
The following figure shows the behaviour of coverage at the national level over the last 10 years.

Graph 1. Vaccination Coverage for Children under One Year Old By Type of Vaccine; Nicaragua, 1997-2006



Graph 2 shows the fluctuation in the target population of children under one year old, as well as the tendency toward a decrease in the number of doses of DTP/Pentavalent-3 applied in the period from 1997 to 2006.

Graph 2. Tendency and Number of Doses of DTP-3/Pentavalent-3 Applied And the Target Population of Children under One Year Old, Nicaragua 1997-2006



3.3 OTHER NIP INDICATORS

The following table presents the behaviour of the access and follow-up indicators of the National Immunisation Programme during the period from 1997 to 2006.

Table 2. Population under One Year Old, Access and Dropout Indicators and Percentage of Municipalities with Less than 95 % and Greater than 95 % Coverage, Nicaragua, 1997 - 2006.

Years	Population	First Penta	Third Penta	Programme Access	Penta Dropout	Programme Dropout	DTP/Penta < 95%	DTP/Penta > 95%
1997	147,614	149,835	139,213	101.5	7.1	7	45	55
1998	169,884	152,329	145,659	89.7	4.4	-30.1	37	63
1999	168,148	158,066	150,391	94	4.9	-1.6	48	52
2000	160,831	155,917	142,384	96.9	8.7	-7.8	60	40
2001	160,831	148,707	147,671	92.5	0.7	-10.5	72	28
2002	164,855	144,942	139,371	87.9	3.8	-11	80	20
2003	166,855	144,235	143,420	86.4	0.6	-6.9	80	20
2004	168,849	135,614	134,088	80.3	1.1	-4.2	87	13
2005	148,650	136,581	128,151	91.9	6.2	-3.2	77	23
2006	149,709	139,869	130,516	93.4	6.7	-3.4	84	16

- **Programme Access Indicator:**

This indicator measures the capacity of the programme to reach each person included in its target population. In the last 10 years, more than 86% of the population has had access to vaccination services with the first dose of the DTP/Pentavalent vaccine, except in 2004 when 79.4% of the population was reached.

- **Pentavalent Dropout Indicator:**

This rate is a follow-up indicator; in other words, it allows the evaluation of the capacity of the health service to complete the vaccination schedule with the third dose of Pentavalent in those children that received the first dose of this vaccine in their first year of life. A lower dropout rate indicates that there is better follow-up given to the children to complete the vaccination schedule. In the last 10 years in Nicaragua, this indicator has been fairly unstable, varying between 0.6 and 8.7. It has remained around 6.5 in the last two years.

- **Programme Dropout Indicator:**

This indicator compares the percentage of children that received the first dose of DTP/Pentavalent with the percentage of those that received the first and last doses of MMR in the basic vaccination schedule applied at the vaccination posts. It is used as a longer-term follow-up indicator. In Nicaragua, this indicator has fluctuated over recent years, with a high percentage of negative dropout rates. This may reflect errors in recording the age of the children completing the schedule; in other words, children who have already completed one year of life have been recorded as being under one year old.

- **Percentage of Municipalities by Range of DTP/Pentavalent Coverage**

The percentage of municipalities with DTP/Pentavalent coverage equal to or greater than 95% has been decreasing since 1999. In 2006, only 16% of the country's municipalities had Pentavalent vaccine coverage over 95% and 41% of them had less than 80% coverage.

The analysis of the data for vaccination coverage is made difficult by the frequent corrections to the population of children under one year old. The target population decreased from 1998 to 2001, beginning to increase in 2002 until it reached levels similar to those of 1999 in 2004. In 2005, after the latest national census data were made available the target population of children (i.e. projected birth cohort) to be vaccinated decreased by approximately 13%.

The analysis of the number of doses of vaccine applied shows a decrease in the application of the first and third doses of the DTP/Pentavalent vaccine from 1999 to 2005. The behaviour of the number of MMR doses applied is very similar; it shows a decrease since 2000. This data on applied doses may indicate the existence of barriers to adequate access and follow-up for children to be vaccinated. However, according to preliminary data from the 2006 Nicaraguan Demographic and Health Survey (DHS), 95% of children from 18 to 29 months old had received the third dose of polio and

pentavalent vaccines. There are no data available to evaluate whether these children are completing their vaccination schedule before or after one year of age.

The analysis of the dropout indicators for Pentavalent-3 and for the programme suggests a persistent error in recording the applied doses. The national dropout rate for the programme has been negative since 1998, and 50% of the municipalities have a negative dropout rate for Pentavalent-3 in 2006. This may indicate that many children complete their vaccination schedules after the age of one year, but that they are recorded as under one year old for Pentavalent-3 or at one year old for MMR. The preliminary results of the last DHS on vaccination coverage of children between 18 and 29 months strengthen the hypothesis of recordkeeping errors in identifying lower MMR coverage than those shown by administrative records for one-year-old children.

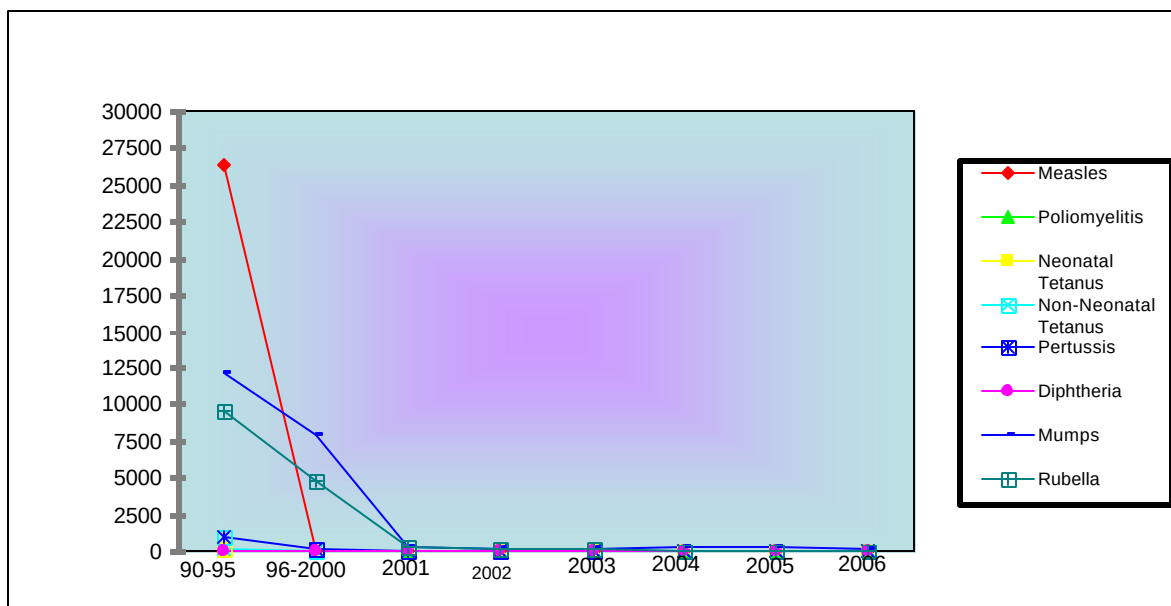
The analysis of municipalities by range of coverage shows that, in 2006, only 16% of the municipalities present coverage greater than or equal to 95% and that 41% of the municipalities present coverage of less than 80%. Even with the constraints already mentioned, this data on coverage by municipality makes it possible to identify the municipalities with the greatest risk. This coincides with the preliminary data from the last DHS, in which the lowest coverage levels are in the rural areas, in the Atlantic region, followed by the central region of the country, in areas with high levels of poverty and low levels of formal education.

In conclusion, even with the difficulty of determining the true gap between those vaccinated and those not vaccinated, the analysis of the data establishes that these gaps exist and that, in order to overcome them, vaccination activities must be intensified in areas that meet the risk criteria. Furthermore, the data point to the urgent need to strengthen the management capacity of the programme's professionals, with an emphasis on the recordkeeping process, consolidation and analysis of data at the local level, then at the municipal and SILAIS levels, and finally at the national level.

3.4 EPIDEMIOLOGICAL SITUATION OF VACCINE-PREVENTABLE DISEASES

The epidemiological situation of vaccine-preventable diseases in Nicaragua has changed drastically in the 26 years of the existence of the National Immunisation Programme.

Graph 3. Number of Cases Reported of Vaccine-Preventable Diseases, Nicaragua, 1990 – 2006



▪ Poliomyelitis:

The last case of poliomyelitis in Nicaragua was reported in December 1981. The country received the certificate of eradication, together with the other countries of the region, in 1994. Nicaragua maintained routine vaccination coverage levels above 90%, from 1995 to 2001 and above 85% in the last five years, except in 2004. To keep the country free from poliomyelitis, a JPV is conducted at least once a year, during which an additional dose of OPV is applied to all children under five years old and epidemiological surveillance has been conducted of the cases of acute flaccid paralysis (AFP). In the period from 2002 to 2006, 153 cases of AFP were reported in those under 15 years of age. Almost all of the cases were excluded by the laboratory and the others were excluded through review of the clinical history and evaluation of sequelae. The country has complied with all the indicators for quality of AFP surveillance in the last five years.

▪ Measles

Since 1994, the year of the last measles epidemic, no cases have been reported in the country. Epidemiological surveillance is active, with approximately 100% of the cases with proper samples in the 1,585-suspected cases of measles reported in the period from 2002 to 2006. The country has not complied with the indicator for proper investigation, which is around 75%, for the last two years and has not complied with the time frame for the arrival of samples to the laboratory for the last three years.

▪ Rubella

The number of cases reported has been decreasing since 1998, when 2,598 cases of rubella were reported. Since 1999, the surveillance of suspected cases of rubella has

been conducted jointly with the surveillance of measles. In 2005, the National Rubella Vaccination Campaign was conducted in Nicaragua, with reports of a total of 47 cases that year and only two cases in 2006. All these cases were directly reported to the Department of Statistics; therefore they are clinical diagnoses that are not confirmed by the laboratory. The country began surveillance of Congenital Rubella Syndrome (CRS) in 2007.

- **Neonatal Tetanus**

The country has eliminated neonatal tetanus, achieving the goal of less than one case per one thousand live births in all municipalities, through the vaccination of women of childbearing age (WCBA) and pregnant women. Since 1998, three cases have been reported, with the last case in 2005; the others were reported in 2001 and 2002.

- **Diphtheria Situation**

The surveillance system has not reported cases of diphtheria since 1987.

- **Non-Neonatal Tetanus Situation**

In the last five years in Nicaragua, the number of cases of non-neonatal tetanus reported annually varied from five to eight cases. In recent years, an effort has been made to vaccinate the group at greatest risk, men over 50 years old.

- **Pertussis Situation**

Eleven cases of Pertussis were reported from 2002 to 2006, ten of which were reported in 2002 with a diagnosis based on clinical criteria; the last case was reported in 2005.

3.5 COMPLIANCE WITH SURVEILLANCE INDICATORS

Nicaragua has been able to eliminate and control vaccine-preventable diseases, maintaining good quality epidemiological surveillance throughout the national territory (surveillance of suspected cases of measles and rubella, acute flaccid paralysis, tetanus, neonatal tetanus, diphtheria and pertussis). In addition to passive surveillance, regular active searches are conducted for cases of VPD. The following tables present the compliance with the surveillance indicators for rubella/measles and for acute flaccid paralysis in the last five years.

Table 3. Compliance with the Surveillance Indicators for Measles/Rubella, Nicaragua, 2002-2006

Indicators	2002	2003	2004	2005	2006
% Units that report weekly	100	100	100	100	100
% Cases with proper investigation	84	90	88	76	74
% Cases with proper blood sample	98	99	100	100	99
% Samples that arrive at the laboratory in <= 5 days	72	82	74	77	57
% Samples with laboratory results in <= 4 days	63	77	73	88	95
% Cases eliminated by the laboratory	100	100	100	100	100

Target: 80% per indicator

Table 4. Compliance with Indicators for Acute Flaccid Paralysis Nicaragua, 2002-2006*

Indicators	2002	2003	2004	2005	2006
% Units that report weekly	100	100	100	100	100
% Cases investigated within 48 hours of report	96	95	100	100	100
% Cases with proper faeces sample	96	100	100	100	93
AFP rate per 100,000 children under 15 years old (target: 1/100,000 < 15 years)	1.3	1.7	1.3	1.4	1.3

Target: 80% per indicator

3.6 STATE OF THE COLD CHAIN AND VACCINE WASTAGE

A substantial amount of efforts has been invested by the country during 2000-2006 in developing the NIP cold chain. Planning of the warehouse capacity on the national level has, from the very start, been done with possible EPI expansion in view. As a result, the national warehouse is currently capable of accepting annual quantity of single-dose presentations of the Pneumococcal vaccine to be introduced in 2008.

The problems with cold chain capacity though do persist on the SILAIS and municipal levels. Cold storage volumes need to be improved. The most recent survey of the cold chain was conducted in August 2007 and allowed to articulate the cold chain needs in terms of equipment and supplies needed.

In the meantime, an elaborate protocol was developed by the cold chain managers as well as training provided for cold warehouse personnel on the local level to assure safe vaccine storage in the current environment. The necessary temperature regimen is

being maintained through regular change of cold elements in the cold boxes while the storage time on the local level is being minimised through more frequent vaccine delivery from the national to SILAIS level.

Also effective social mobilisation strategies assist in achieving high client attendance rates, which minimises vaccine wastages on the service provision level. Together, the protocol for temperature regimen maintenance and social mobilisation measures make it possible to minimize vaccine wastage in the NIP to technically possible levels: for multi-dose vaccine presentations, the average combined wastage rate does not exceed 15% for routine immunisation and national immunisation days whereas for single-dose vaccine formulation it fluctuates around 1%.

3.7 PERCEPTION AND KNOWLEDGE BY USERS REGARDING THE NIP

According to a survey of mothers conducted during the International NIP Evaluation in 2003:

- 83% of mothers believe that vaccines are very important.
- 69% stated that they had received information about vaccines, with the greatest proportion corresponding to those that received information in a health facility (49%), by radio (38%) and by television (21%).
- The vaccine-preventable diseases that are best known by the mothers are measles at 79%, poliomyelitis at 71%, tetanus at 53% and tuberculosis at 17%.
- Of the 95% of mothers that presented their vaccination card, 89% understood its purpose and the same percentage had completed the schedule.
- Of the 88% of mothers of children who were vaccinated, 90% stated satisfaction with the service received and 81% of them indicated that they had been informed about vaccines.
- 87% of the mothers mentioned having been informed about adverse reactions and 92% knew what to do if an adverse event occurred.
- When the children do not go to the centre for vaccination, slightly less than half, 46% were asked for their vaccination card to review the schedule when they accessed health services for any other reason.

3.8 NIP MANAGEMENT TOOLS

The National Immunisation Programme has developed a series of tools to strengthen management at all levels and to ensure universal vaccination, with quality and human

warmth, and epidemiological surveillance capable of identifying and adequately responding in timely fashion to cases suspected of being vaccine-preventable diseases. These tools are listed below.

- Development of the five-year strategic plan that defines long-term goals and strategies, and of an annual operating plan that defines the activities to be developed during the year and sources of funding.
- Scheduling of the proper and timely procurement and distribution of vaccines and supplies.
- Ongoing training of human resources to ensure the safety and quality of the vaccination services offered.
- Regular supervision as part of the process of ongoing training.
- Monitoring of coverage achieved in order to evaluate results and redirect actions.
- Active search for cases to evaluate silent areas and the quality of weekly negative reporting data.
- Identification of areas of greater risk based on the analysis of coverage data and on the epidemiological surveillance of VPD.
- Software and instruments for data collection and analysis on coverage by the SILAIS and the municipalities, follow-up notebooks on the vaccination of children under two years old and a system to record the doses of vaccines applied.
- Promotion of participation by different social segments in order to join efforts in the struggle for control and elimination of VPD.

4. FINANCING AND MOBILISATION OF FINANCIAL RESOURCES DURING 2002 - 2006

In terms of the general distribution of NIP resources by component, the greatest percentages correspond to vaccines and supplies (76.3%), followed by operating expenditures (17.35%), cold chain (3.84%) and social mobilisation (1.32%). A minimal portion, 1.2%, of the resources is allocated to training, supervision, evaluation, epidemiological surveillance and investigation.

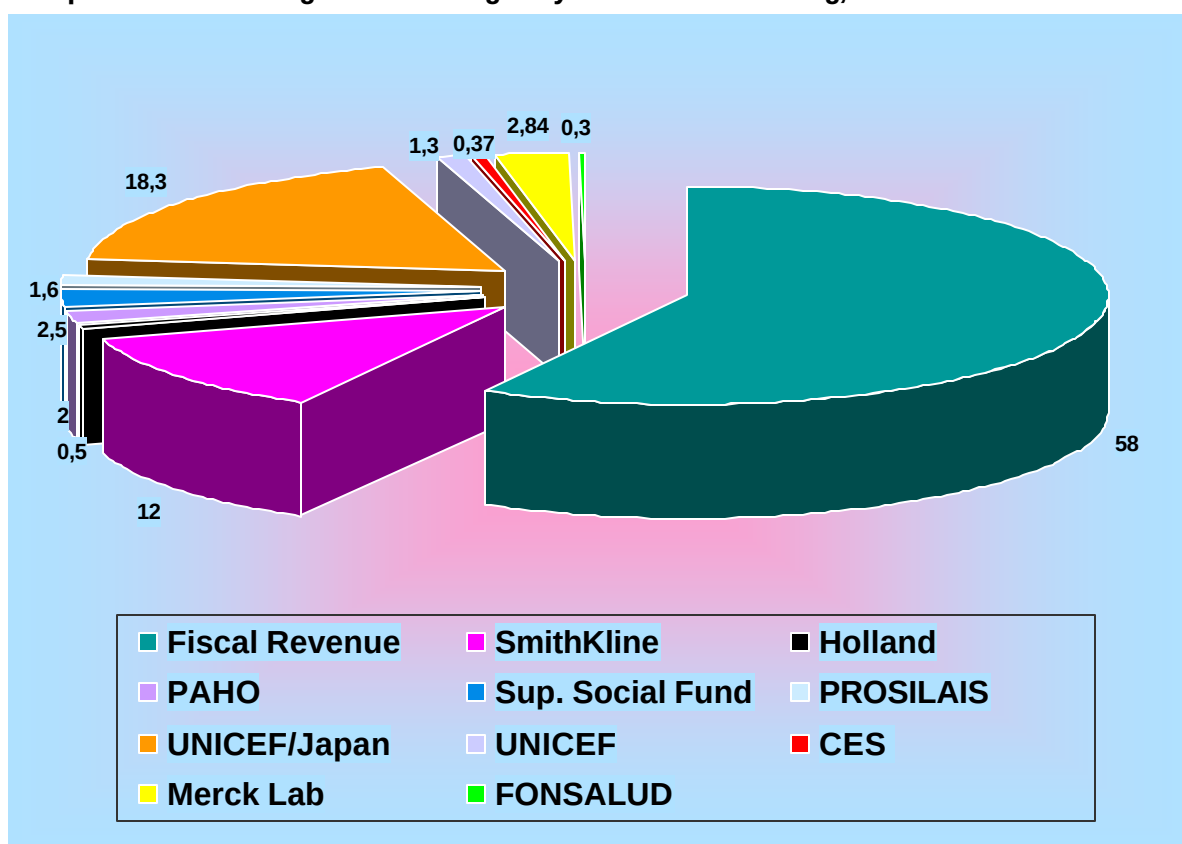
Table 5. Distribution of Financial Resources for the NIP by Components, Nicaragua, 2002 – 2006

Components	2002	2003	2004	2005	2006	TOTAL in US\$	%
1. Vaccines and Supplies	2.667.096	2.823.280	8.426.199	2.820.796	4.888.529	21.625.900	76,32
2. Cold Chain	1.749	60.427	981.521	35.527	10.008	1.089.232	3,84
3. Training	4.000	10.813	17.391	95.375	42.686	170.265	0,60
4. Social Mobilisation	99.407	18.936	38.961	188.624	28.571	374.499	1,32
5. Operating Expenditures	883.081	1.002.284	602.036	1.902.291	527.269	4.916.961	17,35
6. Supervision	12.594	6.899	18.474	47.526	12.942	98.435	0,35
7. Epidemiological Surveillance	507	2.430	9.640	0	6.500	19.077	0,07
8. Investigation	0	0	15.000	0	0	15.000	0,05
9. Evaluation	0	10.336	6.247	6.295	2.988	25.866	0,09
TOTAL	3.668.434	3.935.405	10.115.469	5.096.434	5.519.493	28.335.235	100

Operating expenditures presented in Table 5 do not include immunisation staff costs. This explains a big difference between operating costs in 2002-2006 and those in 2007-2011.

During the period from 2002 to 2006, 58% of the Programme needs were financed from the national funds. Of these funds, the largest percentage was expended on the procurement of vaccines and supplies (81%), followed by operating expenditures (18%). The remaining 1% was allocated to the components of social mobilisation, supervision and evaluation.

External financing comprised 42%, with the valuable contribution of the following aid organisations and donors: PAHO/WHO, UNICEF, the Government of Japan, the PROSILAIS Supplementary Social Fund, Glaxo SmithKline Laboratory, the Government of the Netherlands, FONSALUD, Coverage Extension Strategy (CES) Funds, and MERCK Laboratories, presented in the graph below.

Graph 4. Nicaraguan NIP Budget by Source of Financing, 2002 - 2006

The external financing mentioned above refers only to the resources issued to the national level of the MINSA; it does not include resources disbursed directly to the decentralised levels to support the NIP .

With the introduction of the MMR, Pentavalent, hepatitis B and rotavirus vaccines in the last nine years, the appropriation of funds has increased for vaccines and supplies, with valuable donations thus far by SmithKline, the Government of Japan and Merck Laboratories, which have financed the purchase of these vaccines. Currently, the only vaccine that is not purchased through national funds is the rotavirus vaccine for which there is a donation agreement by Merck Laboratories until 2009.

Likewise, the cold chain has been enhanced by financing and donations from UNICEF's NIP Support Project, with funds from the Government of Japan.

The financial support offered to the SILAIS during this period has been aimed mainly at strengthening the cold chain, particularly purchase of equipment and supplies and training of personnel, as well as comprehensive supervision of the NIP components, strengthening of surveillance of vaccine-preventable diseases, operating expenses for the Massive Vaccination Campaigns, and annual evaluations.

3.9 INTRODUCTION OF NEW VACCINES

In 1980, when the National Immunisation Programme was formed, the BCG, OPV, DTP, measles and dT vaccines were used in the country. In April 1998, the triple viral vaccine against measles, mumps and rubella (MMR) was introduced into the basic vaccination schedule, and in September 1999, Pentavalent vaccine was introduced, working against diphtheria, pertussis, tetanus, hepatitis B and infections caused by *Haemophilus Influenza B*. At the end of October 2006, the rotavirus vaccine was introduced in Nicaragua in order to decrease morbidity and mortality rates due to diarrhoea in children under five years old, and especially in infants under one year of age. With this new vaccine, the national vaccination schedule currently has 11 vaccines. The Ministry of Health plans to introduce the pneumococcal vaccine in 2008, with the support of the GAVI Alliance.

Based on the experience with the introduction of the pentavalent vaccine, a **Plan for the Introduction of the Rotavirus Vaccine** was developed to assure the fulfilment of all the requirements for the safe introduction of this new vaccine. The plan included the following activities:

- Evaluate burden of acute diarrhoeal diseases, morbidity and mortality caused by them.
- Set up joint technical-management teams responsible for coordinated introduction of the rotavirus vaccine at the various management levels (national, departmental and municipal).
- Review cold chain capacity to inform procurement of lacking electrical and solar refrigeration equipment, cold boxes and coolers.
- Develop technical and operational guidelines and requirements to assure safe vaccine introduction.
- Coordinate with professional scientific associations and the Committee on Immunisation Practices distribution of roles and responsibilities to support the introduction of the vaccine.
- Develop guidelines and requirements to assure timely and appropriate provision of vaccines and supplies at all levels.
- Provide technical education and cascade training for field personnel to ensure knowledge of standards for transportation, conservation and application of the rotavirus vaccine as well as the surveillance of Events Supposedly Attributable to Vaccination and Immunisation (ESAVI).
- Provide parents and custodians with up-to-date information concerning vaccination.

- Redesign information management system for recording, capturing, processing and reporting data related to handling and administration of rotavirus vaccine, for information at the municipal, departmental and national levels.
- Develop a supervision plan to evaluate and monitor supply, storage and administration of the rotavirus vaccine.
- Develop a social promotion and mobilisation plan.
- Design of a series of instruments including:
 - technical teams guide specifying components and activities required to introduce the vaccine at different levels;
 - tools for estimating needs and costs by category and activity; and
 - checklist of necessary supervision, monitoring and evaluation activities during new vaccine introduction.
- Develop training and information materials directed at health professionals and the community.

5. STRENGTHS AND WEAKNESSES OF THE NATIONAL IMMUNISATION PROGRAMME

COMPONENT	STRENGTHS	WEAKNESSES
9.1 Policy and Legal Aspects	- The NIP has been considered a priority public health programme. - The General Health Act and its regulations support the NIP as a public health priority. - The NIP is seen as a priority by health care personnel. - The Programme has very good acceptance by the population. - The NIP has great prestige in multilateral and bilateral aid institutions. - The Inter-agency Coordination Committee, incorporated into the Sectoral Roundtable, operates on a regular basis. - Vaccination coverage is part of the management commitments. - Vaccination coverage and other programme indicators were incorporated as outcome indicators in the Enhanced Economic Growth and Poverty Reduction Strategy (ERCERP), in the National Development Plan and in the Millennium Summit Goals.	Inter-institutional support is often limited to massive intervention strategies.
9.2 Scheduling and Planning	- The NIP has a National Five-Year Plan. - The national Annual Operating Plan includes priority activities to be developed at all levels, in order to support the search for resources to finance priority activities. - All SILAIS have an annual NIP schedule. - Some health units conduct a local census to more precisely determine their target population. - The purchase of vaccines is centralised and the Revolving Fund is used to ensure quality and the lowest costs.	- Basic information from the programme is not used for scheduling and decision-making at the local level. - Operational scheduling at the local level is not usually based on epidemiological risk criteria, the analysis of coverage data, programme indicators or epidemiological behaviour of the VPD. - The health units use estimates by the Nicaraguan Institute of Statistics and the Census (INEC) to set their targets. These estimates are generally not considered to very accurate and, combined with fluctuations, limit the ability to schedule and evaluate outcomes in some territories.

COMPONENT	STRENGTHS	WEAKNESSES
5.3 Organisation and Coordination	- The network of vaccination services has approximately 1000 health units, distributed throughout the nation. - The NIP has a proper flow chart at the level of the health units, with accessible and well-identified environments. - There are mechanisms for coordination with other health programmes. - There is coordination with other sectors, state agencies and institutions, especially during campaigns. - The SILAIS are increasing inter-agency coordination and citizen participation. - There is a Sectoral Roundtable.	- The flow of care among the different maternal and infant care programmes is not very fluid at the level of the health units. This increases waiting time. - The lack of systematic review of the vaccination cards of children who come to the health units and hospitals seeking a medical consultation or other type of care results in lost vaccination opportunities. - The majority of the hospitals do not routinely vaccinate children and adults, which results in lost opportunities. - There is little coordination with other institutions and the private sector outside of the Massive Vaccination Campaigns. - The inter-agency coordination at the local level has not yet reached the expected level of development.
9.4 Implementation	- Most of the vaccination activities are completed as scheduled. - All vaccines are offered five days a week, and some facilities even offer them on weekends. - Different vaccination strategies are implemented in order to facilitate access to the vaccines by the population. - There is an ongoing effort to comply with the standards for safe vaccination in all services.	- There is a lack of proper transportation available to conduct the priority activities. - Some facilities do not have a safe way to dispose of needles and vials.
9.5 Human Resources	- There is a professional responsible for the programme in each SILAIS and in each municipality. - There have been human resources to undertake programme activities at all institutional management levels and in the Massive Vaccination Campaigns. - There is enthusiasm for the programme among health officials. - The NIP management has responded appropriately to demands for equipment, forms and record cards, etc.	- There are limited human resources for field visits. - There is no incentive or development policy for human resources. - There is high turnover among personnel that work on these activities.

COMPONENT	STRENGTHS	WEAKNESSES
9.6 Physical and Material Resources	- There is a duly identified physical space for vaccination in the majority of health facilities. - The SILAIS headquarters has a space that is exclusively for the EPI. - The supply of syringes, vaccines, safe boxes and paperwork has been maintained for the NIP activities in all facilities.	- In some sites, the physical space used for vaccination activities does not have the proper conditions. - There are insufficient and/or deficient means of ground, water and animal transportation and communications equipment in some areas.
9.7 Budget and Financial Resources	- There are fiscal resources to finance the NIP within the MINSA budget, specifically for the purchase of vaccines and for operating expenses. - There is support at the local and national level from NGOs and other partners with specific projects in which the target population is comprised of priority groups for the Immunisation Programme. - There is financing from aid agencies that complements the fiscal resources for the Massive Vaccination Campaigns in the SILAIS.	- The availability of financial resources for field vaccination activities is irregular, especially for payment of per diems and transportation. - Financial resources have not been disbursed in a timely fashion for attention to areas that are difficult to access. - The components of supervision, evaluation and training, which are the fundamental components for strengthening of management, have been most affected by the deficit of financial resources for the NIP. - Usually, external financing is not provided on an ongoing basis. - Once the Sectoral Roundtable was created, the Inter-agency Coordination Commission was absorbed by it, weakening direct relationships with the NIP.
9.8 Training and Supervision	- The manual of guidelines and procedures for vaccination and epidemiological surveillance of the vaccine-preventable diseases has been updated and distributed. - The NIP and surveillance standards are known. - Regular training and updating sessions are conducted for personnel. - There is a standard instrument for supervision and a copy of this is provided to the personnel for follow-up. - There is a supervision plan at the SILAIS and municipal levels.	- In most cases, supervision is subordinate to the need for transportation resources for other activities. - In some municipalities, supervision that is done is not documented and there is no evidence of follow-up to commitments made during supervision. - Supervision plans are usually interrupted due to lack of per diems, transportation and the needs of other activities. - In some places, supervision is centred on coverage, missing the opportunity to review all the other components of the programme.

COMPONENT	STRENGTHS	WEAKNESSES
9.9 Information System	- There is a specific information system for the NIP with flow defined at all levels. - Monthly monitoring of vaccination coverage is conducted at the SILAIS level.	- There is limited analysis of the vaccination coverage information for decision-making at the municipal and local levels. - There are not suitable mechanisms for quality control of the information among the different levels.
9.10 Epidemiological Surveillance	- There is daily reporting, at the national level, of suspected cases of vaccine-preventable diseases. - There is a professional responsible for the epidemiological surveillance system for all diseases at the national level. This professional manages the database and provides follow-up to reports and actions. - There are updated NIP surveillance manuals and standards.	- Active searches for suspected cases of VPD are not conducted on a systematic basis. - There is limited feedback on the situation of VPD surveillance at the local and municipal levels. - There is little coordination with the private health providers and clinics for reporting cases. - In general, epidemiological analysis of VPD is not conducted with a risk approach.
9.11 Cold Chain, Logistics and Necessary Supplies	- The MINSA has a National Vaccine Centre that complies with all the requirements for proper storage of vaccines until their distribution to the SILAIS. - There is a Preventive Maintenance Manual. - Health facilities are furnished with refrigeration equipment and components of the cold chain. - Over 95% of the health units have properly functioning cold chain equipment. - Thirteen of the SILAIS have maintenance technicians and 100% of the personnel in the health units have been trained.	- Not all the SILAIS have technical personnel for the repair of the refrigeration equipment. - The preventative maintenance standards are not applied in some facilities.
9.12 Evaluation and Research	- Regular evaluations are conducted at all levels to facilitate decision-making. - The programme uses operational methods of evaluation and research to identify strengths and weaknesses in its various components.	- Local evaluations are directed mainly at coverage. - The evaluations conducted are not documented with reports at the operations level. - There has not been continuity in the new research methods or in the review of research conducted.

COMPONENT	STRENGTHS	WEAKNESSES
9.13 Social Communicati on and Community Participation	• The health units conduct educational activities related to vaccination at the time the service is sought. • There is active participation by community leaders, midwives and volunteer health workers (<i>brigadistas</i>) in vaccination activities, primarily in the Massive Vaccination Campaigns (JPV). • The promotion and publicity regarding vaccination activities are strengthened during the JPV and other campaigns that have support from multiple sectors.	• There is not a permanent Information, Education and Communication Plan (IEC) for the NIP. • There is not a defined policy to provide incentives to personnel and the community network. • Not all of the potential of the community and the various social sectors is utilised to strengthen the NIP activities.

6. STRATEGIC AREAS FOR ACTION IN THE 2007-2011 PERIOD

- 1. Maintain achievements and reach required coverage with the BCG, Pentavalent, OPV and Rotavirus vaccines in the first year of life and with MMR between 12 and 23 months of age in all municipalities.**

Through effective and sustainable delivery of immunisation services, consolidating multi-sectoral and community participation at the local and national level, and strengthening technical and management capacity at all levels, particularly through technical assistance in the formulation, follow-up and evaluation of operating plans at the decentralised levels, and seeking the financing needed to ensure interventions and follow-up on them.

Inter-sectoral and Intra-sectoral Coordination:

- Strengthen the capacity for advocacy to seek support for NIP activities from other institutions such as municipal governments, the army, police, the Ministry of Education, and civil society organisations.
- Integrate the programme with other strategies that are based in the community, such as PROCOSAN, the Coverage Extension Strategy and others.

Community Participation:

- Develop a joint work plan with leaders and community health volunteers to optimise the vaccination activities in at-risk populations that are difficult to access.
- Develop a social communication and promotion plan to increase the conscious demand for vaccine.

Technical and Management Capacity:

- Support the development, follow-up and evaluation of operating plans at the decentralised levels, with priority on the areas with difficult access.
- Strengthen the decentralisation of the programme at the local level.
- Update the NIP personnel at all levels regarding the programme standards.
- Seek resources for the implementation of a plan for regular supervision, monitoring and evaluation of the programme at all levels.

- Provide health care personnel with the knowledge, tools, abilities and skills to strengthen technical and management aspects, particularly those identified as weak in supervision visits.

Information System:

- Review the database for the information system of the NIP in order to correct some problems identified in reports issued and to incorporate new vaccines.
- Review the record forms and vaccination cards in order to include data on new vaccines.
- Strengthen the capacity for proper recordkeeping, monitoring and evaluation of the quality of the data among personnel at all levels. Strengthen the capacity for data consolidation and analysis, as well as the use of information in the planning and monitoring of activities.
- Update and develop software to analyse coverage and instruments for monitoring and evaluation at the local level.

2. Strengthen and expand the epidemiological surveillance system.

By updating the data collection and recording system; implementation of epidemiological surveillance of diseases that can be prevented by new vaccines; training personnel in timely detection, proper investigation and the immediate implementation of response measures when faced with suspected cases of VPD and ESAVI, as well as the analysis of surveillance data; ensuring the conditions for good quality laboratory diagnosis; and creating channels to receive reports of diseases directly from the community.

Information System

- Update the records of investigations into suspected cases to facilitate the collection of all data needed for proper risk analysis.
- Review of the surveillance database to make the existing system more flexible and to facilitate data analysis.

Technical and Management Capacity

- Provide training on standards and procedures for epidemiological surveillance to ensure early detection, proper investigation and adoption of suitable response measures.
- Train NIP personnel regarding ESAVI, including capacity to investigate suspected cases and respond to them, and to conduct regular analysis of the ESAVI surveillance data.

- Provide ongoing training for surveillance personnel to conduct surveillance data analysis and monitoring of quality indicators.
- Review supervision guide.
- Prepare and implement a plan for regular supervision, monitoring and evaluation.
- Immediately implant epidemiological surveillance for diseases that can be prevented by new vaccines, influenza and pneumonias and bacterial meningitis.
- Strengthen the system of community VPD surveillance.
- Conduct active searches for cases in silent areas and evaluate negative reporting data.
- Evaluate fulfilment of activities and indicators with those working at the various levels.

Laboratory Diagnosis

- Ensure the supplies and equipment necessary for a proper laboratory diagnosis.
- Keep the reference laboratory personnel current on techniques and procedures for the diagnosis of VPD.
- Train field personnel to take, transport and store samples.
- Support the reference laboratories in regular external quality control.

3. Ensure safe vaccination practices.

Through the procurement of quality vaccines and syringes, the training of personnel and the proper disposal of waste. Given the great importance of the cold chain to ensuring safe vaccination practices, this component is presented as a specific strategic activity.

Vaccines:

- Continue purchasing good quality vaccines.

Supplies:

- Continue supplying good quality syringes, seeking to introduce auto-disable (AD) syringes in the NIP.

Technical Capacity

- Ensure appropriate vaccination techniques.
- Properly store and manage the vaccines.

Waste:

- Assure the proper disposal of waste.

4. Maintain a cold chain with proper capacity and quality.

Through the expansion of the storage capacity of the cold chain with the introduction of new vaccines, ensuring that the cold chain has good quality equipment and available parts and replacement materials, with personnel trained in the standards for preservation of vaccines, preventive and corrective maintenance, and strengthening the capacity to supply vaccine to the health services, providing equipment to new health units.

Equipment and Supplies

- Maintain a current inventory of the cold network at all levels.
- Evaluate the capacity of the cold chain for the introduction of new vaccines.
- Maintain a proper storage capacity at the local and national levels.
- Ensure that there is personal safety equipment for human resources that work in the CENABI.
- Provide a refrigerated vehicle to the national level for proper transportation of the vaccines to the SILAIS.
- Provide cold boxes to the SILAIS and municipalities for the transportation of vaccines.

Technical and Management Capacity

- Train NIP personnel in the storage of vaccines and preventive maintenance of the cold chain equipment.
- Train personnel in the repair of refrigeration equipment at the decentralised levels.
- Maintain a programme of supervision and evaluation of cold chain management and operations.
- Update the software to support the management of the cold chain.

5. Ensure the safe introduction of new vaccines.

By strengthening the capacity to perform studies of the burden of disease and economic impact, and developing and implementing introduction plans that include all the components necessary to the safe introduction of new vaccines.

Capacity for Investigation and Analysis

- Strengthen the epidemiological surveillance system in order to have data to evaluate the burden of diseases that can be prevented by new vaccines.
- Train personnel for the analysis of data and estimation of the burden of disease.
- Train personnel to perform cost-effectiveness studies.
- Train personnel to perform financial sustainability studies.

Planning and Management Capacity

- Strengthen the capacity of the NIP personnel to develop and implement plans for the safe introduction of new vaccines.
- Ensure the coordination and participation of committees of experts in the introduction process.
- Implement IEC strategies for the introduction of new vaccines.

Technical Capacity

- Train public and private health professionals in the NIP vaccines, with an emphasis on the new vaccines.

6. Ensure the sustainability of the NIP.

By strengthening the legal framework, multi-sectoral and community coordination, and the capacity for advocacy.

- Promote a Law on Vaccines with a broad consensus that will ensure the financial resources needed to purchase vaccines and supplies and to implement the NIP Operating Plan.
- Develop a work plan in conjunction with the Inter-agency Coordination Committee.
- Continue the activity of the National Immunisation Practices Committee.
- Sustain the good technical and management capacity of the NIP personnel at all levels.
- Strengthen the advocacy capacity of the personnel at all levels in order to seek human, material and financial resources for the proper operation of the programme.

7. NIP COST AND FINANCING 2007-2011

Tables 6 and 7 below demonstrate estimated costs of the National Immunization Programme of Nicaraguan during years 2007-2011 based on the scenario of Pneumococcal vaccine introduction in 2008 and no applying for GAVI support to maintain immunisation by Rotavirus vaccine.

Table 6. NIP Cost in 2007-2011 by Programme Components without Pneumococcal vaccine introduction cost

PROGRAM COMPONENT OR ACTION AREA	Costos por año en US\$ (calculados en miles)					Total
	2007	2008	2009	2010	2011	
Regulation, Organization and Coordination	31.2	136.9	31.2	123.9	31.2	353.4
Other operation Costs	6,989.2	7,053.4	7,006.4	7,004.8	6,992.2	35,046.6
including NIP staff salaries	6,000.0	6,000.0	6,000.0	6,000.0	6,000.0	30,000.0
Vaccine & Biologicals	8,346.1	13,572.7	10,859.9	10,907.2	12,293.4	55,979.3
vaccines	7,941.5	12,989.0	10,316.1	10,358.0	11,712.8	53,317.4
injection supplies	404.6	583.7	543.8	549.2	580.6	2,661.9
Cold Chain	183.0	2,624.8	559.0	277.7	228.2	3,872.8
Epidemiological Surveillance	92.0	177.8	92.0	178.0	92.0	631.4
Supervision	145.6	145.6	145.6	145.6	145.6	728.0
Monitoring and Evaluation	102.0	72.0	72.0	102.0	72.0	419.3
Training	199.6	199.6	199.6	199.6	199.6	998.0
IEC & SocMobilization	196.0	196.0	196.0	196.0	196.0	980.0
Research	321.3	42.0	22.0	22.0	22.0	429.3
Special Projects	242.0	75.0	75.3	75.3	75.0	542.9
TOTAL	16,848.0	24,295.8	19,259.0	19,232.1	20,347.1	99,981.0

Table 7. NIP Cost in 2007-2011 by Programme Components with Pneumococcal vaccine introduction cost

ÁREA DE ACCIÓN O COMPONENTE DEL PROGRAMA	Costos por año en US\$ (calculados en miles)					Total
	2007	2008	2009	2010	2011	
Regulation, Organization and Coordination						353.4
Operational Costs		59.1				35,105.7
Vaccine & Biologicals						55,979.3
Cold Chain		432.9				4,305.7
Epidemiological Surveillance		48.1				679.5
Supervision		111.4				839.4
Monitoring and Evaluation		57.1				476.4
Training		72.1				1,070.1
IEC & SocMobilization		205.8				1,185.8
Research						429.3
Special Projects						542.9
TOTAL		986.6				100,967.6

There are two main factors that explain increases in the NIP costs from 2006 (as seen from Table 5) to 2007, and then from 2007 to 2008 (as seen from Table 6). *First*, staff cost was not included into cost estimation for 2002-2006, whereas it was fully incorporated into projections for 2007-2011. *Second*, country estimates include overall

costs for the rotavirus vaccine for 2007-2011, as well as the introduction costs for the Pneumococcal vaccine in 2008.

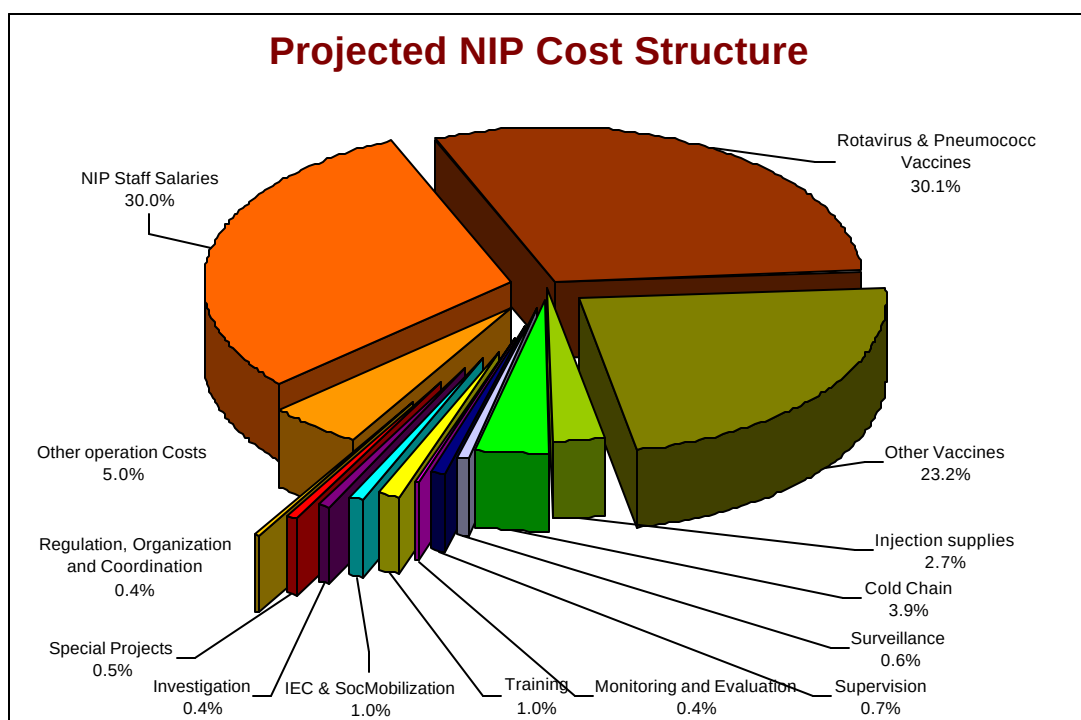
The National Immunisation Programme depends financially on both national funds and external financial support. In the scheduling and implementation of expenditures for the 2002-2006 Five-Year Plan, foreign aid has, without a doubt, enabled the National Immunisation Programme to flourish within the Ministry of Health, providing support equivalent to 42% of the total budget required for that period.

The sustainability of the NIP Programme is dependent on setting up fixed budget line items intended exclusively for procurement of vaccines and supplies, meeting NIP operating costs and ensuring effective functioning of the cold chain network.

For the period from 2007 to 2011, the NIP budget totals US\$100,967,000. Of this amount, US\$59,957,900 or 59.4% are to be funded from national budget, US\$23,828,100 or 23.6% from external funds, whereas 17.0% of the total estimated budget (US\$17,181,500) is without financing at this time. The NIP will submit requests to organisations and institutions to provide funds to support the planned activities that are necessary to strengthen the Immunisation Programme and that do not have ensured financing. Work will be done to prepare a proposed Law on Vaccines with a broad consensus to ensure the funding and sustainability of the NIP.

Graphically, the projected NIP costs structure is represented on the Graph 5.

Graph 5. Projected NIP Cost Structure by Programme Components



The newly introduced vaccines account for 30.1% and remaining vaccines for 23.3% of the total Programme cost. The salaries of the personnel involved into provision of immunisation services will presumably consume 30.0% of resources, Other operational cost will account for 5.0%, while expenditures for building-up cold chain capacity 3.9%, and injection supplies for 2.7% of total cost. Relatively minor shares (from 1.2% to 0.4%) of the Programme cost will be attributable to remaining line items

The Graph 6 below demonstrates relative weights of the Program components in terms of needed resources as well as relative weights of secure financing against deficit for each of the Programme component

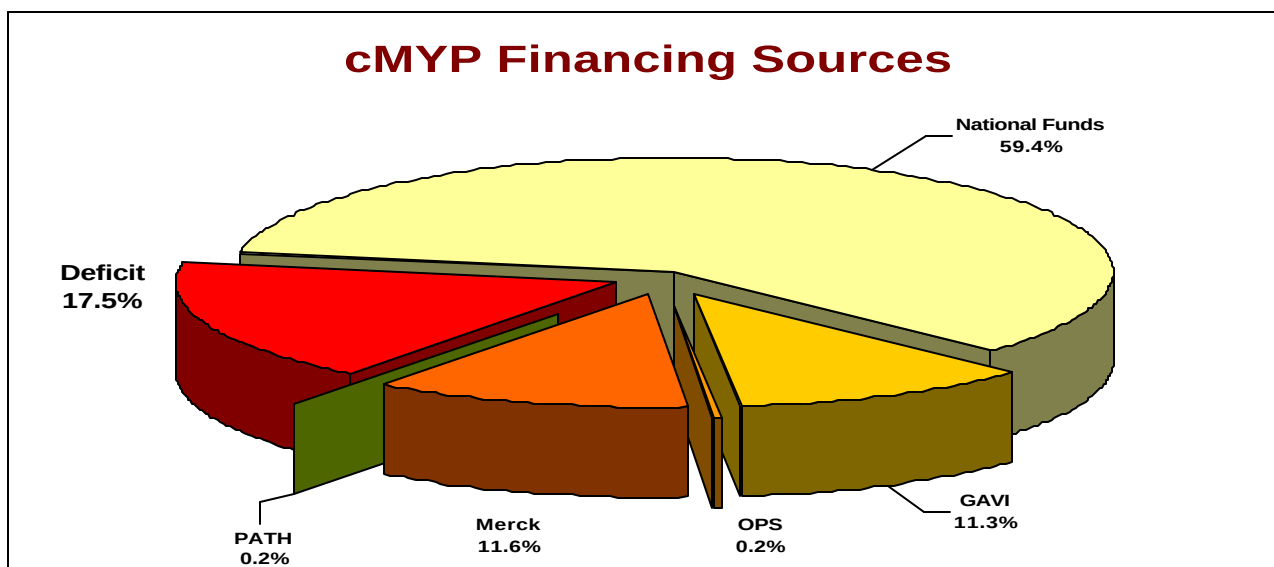
Graph 6. Relative shares of the cMYP total Resource requirements by components, available financing (blue) and deficits (red)



As seen from the Graph 6, the Programme Components suffering the biggest absolute financing gap seem to be 'Vaccines & Supplies Procurement' and 'Cold Chain Equipment' whereas much smaller (although not least significant) components may have relatively small absolute deficit while being 50 to 95% under-funded.

Graph 6 presents the structure of financing sources for the NIP of Nicaragua as well as the size of existing financing gap (or deficit).

Graph 7. cMYP Financing sources and Programme Deficit

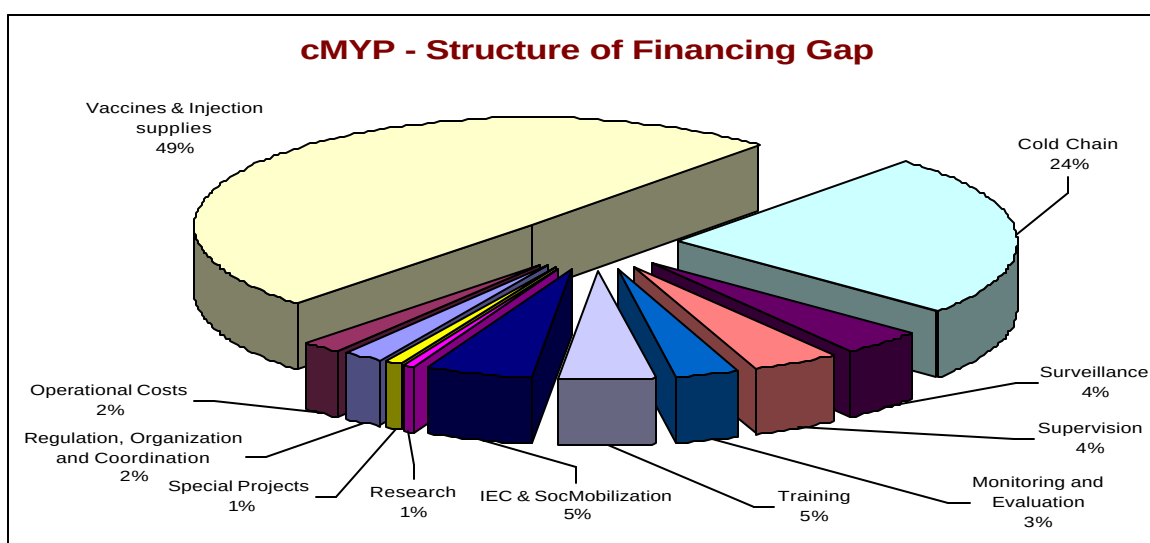


Detailed analysis of the financing gap, its origin and structure will help to understand the strategies that the country is going to adopt to assure successful NIP performance under the significant monetary constraints.

Financial Gap Analysis

Financial gap of the MYP is currently estimated at \$18.1 million or 17.5% out of the total \$101.0 million that the Programme would cost during 2007-2011. The structure of financing gap is presented on the Graph 7 below.

Graph 8. cMYP financing Gap Structure by Programme Components



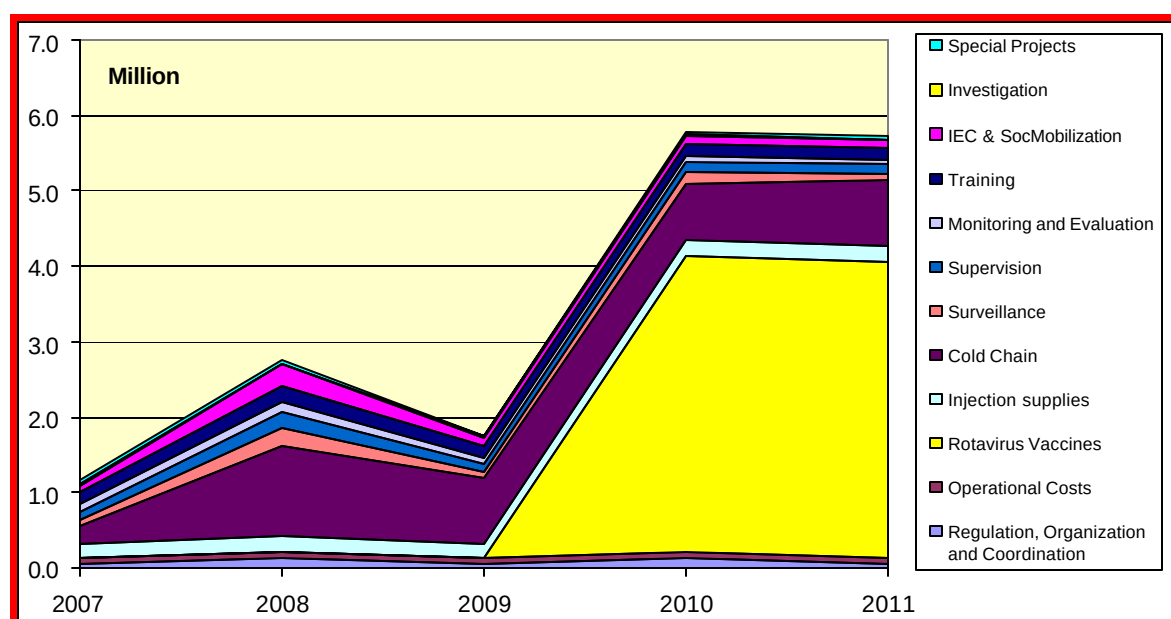
Currently observed financing gap in the 'Vaccines and Supplies' Program component is mostly caused by the lack of Government's funds to finance \$7.9 million worth of Rotavirus vaccine procurement after October 2009, when free procurement of the vaccine to Nicaragua by Merck (MSD) comes to an end.

While the Government does have a clearly defined strategy to address the issue, specifically, an application for GAVI support to maintain vaccination against rotavirus throughout 2010-2015, the planning standards demand that the components costs without proven financing to be defined as unfunded.

The financial burden for the government to sustain vaccination against rotavirus with GAVI support would amount to additional \$65 thousand during 2009-2010 and to around \$90 thousand per year during 2011-2015 (provided co-payment level for the vaccine is established at \$0.15 and \$0.20 correspondingly). For comparison, in 2007 the Government is planning to allocate around \$4.1 million for overall vaccine procurement. The Government considers this additional contribution as a valuable investment into health care taking into account currently observed burden of diseases resulted by rotaviruses.

It should be noticed that the total need in vaccines was calculated based on the assumption that the country will succeed in achieving coverage rates consistent with Millennium Development Goals set for Nicaragua. Therefore number of doses was calculated assuming 99% coverage for every EPI vaccine.

Graph 9. cMYP Future Financing Gap



Of the remaining funding gap, cold chain needs account for the biggest share of deficit – \$4.39 million (or 24.3%) of the total resource shortage, and, unlike for vaccines, no definitive partner has yet been identified to assist in covering this part of gap. However,

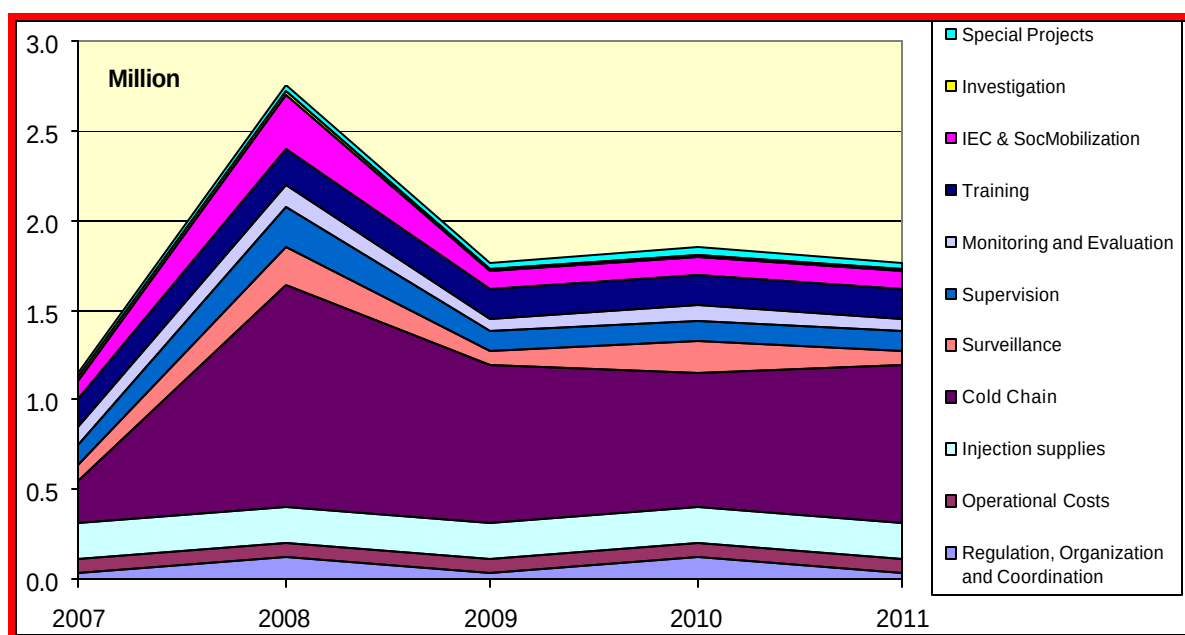
initial talks have been held with Cooperation Agencies to cover it, including the remaining 26.3% share of the other components (roughly 4.76 million dollars).

The distribution of financing gap across the NIP timeline is represented on the Graph 9 above.

As was already mentioned, the Programme cost and financing structure described above reflects the scenario of NIP development, according to which the country will introduce Pneumococcal vaccine in 2008 and will continue to search collaborative partners for assuring further support of Rotavirus vaccine.

If, however, Nicaragua is successful in attracting GAVI support for maintaining Rotavirus vaccination, the magnitude of financing gap observed on the Graph 9 will change having lost Rotavirus vaccine component (as seen from Graph 10).

Graph 10. cMYP Future Financing Gap



It should also be noticed that in the case of successful Application to GAVI for Rotavirus vaccine support the estimated NIP cost will fall by US\$1.75 million in 2010 and by US\$1.76 in 2011 because of the lower Rotavirus vaccine price supplied through GAVI: US\$5 per dose (maximum price) as opposed to US\$9 per dose for current supplies from MERCK. Government annual expenditures in this case will increase by approximately US\$89 thousand to cover the copayments necessarily foreseen by the GAVI Phase-II terms of support.

8. FINANCIAL SUSTAINABILITY STRATEGIES

To bridge the projected financing gap, Nicaragua is focusing its efforts on the following three strategies:

1. Using opportunities provided by GAVI to finance vaccine and supplies procurement for the Programme

The country is currently applying for GAVI support in introducing – starting from 2008 – Pneumococcal vaccine. In addition to this, the Government is also planning to receive GAVI assistance to maintain Rotavirus vaccine that started in the second half of 2006 with the Merck support. To this end, the application process will be initiated at the end of 2008.

The one-time implementation grant accompanying GAVI-assisted vaccine procurement is worth \$100,000 to cover a part of the financing gap related to the new vaccine introduction.

The country is also applying for GAVI Health System Strengthening (HSS) and Immunisation System Strengthening (ISS) support. If granted, these types of support would allow mobilizing in 2008-2011, additional \$183,660 through ISS mechanism and up to around \$350,000 annually (i.e. around \$1.4 million during 2008-2011) through HSS mechanism.

2. Applying – through UNICEF – for support of Japanese Government in covering the Programme needs, mainly in the cold chain build-up

An application has been developed and submitted to UNICEF to receive from the Government of Japan, support for building up capacity of the National cold chain and other components. |

3. Involvement of NGOs, Bilateral and multilateral cooperation at local levels, SILAIS and municipalities.

While no projections exist as to the possible extent of gap needs that could be covered through this sort of assistance, NGOs and bilateral and multilateral cooperation involvement into Programme activities at sub national levels could significantly improve its performance. It is about not only financial resources, but also experience and expertise that may be obtained from these stakeholders. Many NGOs and cooperation partners have recognized experience in social mobilization, communication, training and evaluation.

ANNEXES:

1. BASELINE DATA AND ANNUAL GOALS
2. SUMMARY OF THE 2007-2011 ANNUAL BUDGET FOR THE IMMUNISATION PROGRAMME
3. SUMMARY OF THE 2007-2011 BUDGET AND SOURCES OF FINANCING
4. NATIONAL VACCINATION SCHEDULE FOR NICARAGUA 2008
5. 2007- 2011 ACTION PLAN
 - 5.1 VACCINES & SUPPLIES PROGRAMMING
 - 5.2 COLD CHAIN PROGRAMMING
6. ACTION PLAN NIP FIVE-YEAR PLAN PER AREA, PER YEAR, 2007-2011

Annex 1: Baseline and annual targets

Number		Baseline and targets					
		Base Year	GAVI Application Year	Programme Year 1	Programme Year 2	Programme Year 3	Programme Year 4
		2006	2007	2008	2009	2010	2011
Births (population <12 months)		149,709	136,16	137,437	138,558	139,122	139,817
Infant deaths (<12 months)		1850 (p)	1480	1332	1199	1079	971
Surviving infants (Population of one year olds)		147,624	135,043	136,187	137,237	137,813	138,364
Pregnant women (Expected)		174,098	156206	157,827	159,887	161,938	163,882
Infants vaccinated with BCG		150,413	133, 330	136,062	137,449	138,287	139,117
BCG coverage * (?)		100%	97.9%	99	99.2	99.4	99.5
Infants vaccinated with OPV3		131,228	133, 330	136,062	137,449	138,287	139,117
OPV3 coverage (?)		87.7%	97.9%	99	99..2	99..4	99..5
Infants vaccinated with DTP3*** (Pentavalent)		130,516	133, 330	136,062	137,449	138,287	139,117
DTP3 coverage ** (?)		87.2%	97.9	99	99.2	99.4	99.5
Infants vaccinated with DTP1*** (Pentavalent)		139,869	135996	137,422	138,548	139,116	139,812
Wastage ^[1] rate in base-year and planned thereafter (Pentavalent) (? ?)		1	1	1	1	1	1
Infants vaccinated with 3 rd dose of Rotavirus		14	133, 330	136,062	137,449	138,287	139,117
Rotavirus coverage**		0.01%	97.9%	99	99.2	99.4	99.5
Infants vaccinated against measles (MMR)		144,584	135,043	136,187	137,237	137,813	138,364
** Measles vaccine (MMR) coverage		97.90%	100%	100%	100%	100%	100%
Pregnant women vaccinated with TT+		52,750	52,11	52,798	53,487	54,173	54,773
TT+ coverage ****		30.2	30%	30%	30%	30%	30%
Vitamin A	infants (> 6 months – 4 years)	861592	606,513 -90%	609,672 (90%)	612,677 (90%)	614,548 (90%)	617621 (90%)

Source: NIP - DGPD
MINSA data & INIDE data

Annex 2: Summary of current and future Immunisation budget

Cost Category	Estimated costs per annum in US\$ (,000)					
	Current Year 2007	Year 1 2008	Year 2 2009	Year 3 2010	Year 4 2011	Total
1. Standardisation, Organisation, Coordination & Advocacy	31.2	136.9	31.2	123.9	31.2	353.4
2. Operational Costs	6989.2	7053.4	7006.4	7004.8	6992.2	35046.6
3. Vaccines & Supplies	8346.13	13572.72	10859.87	10907.19	12293.38	55,979.29
4. Cold Chain	183	2624.8	559	277.7	228.2	3872.8
5. Epidemiological Surveillance	91.96	177.76	92	178	91.96	631.4
6. Supervision	145.6	145.6	145.6	145.6	145.6	728.2
7. Evaluación	102	72	72	102	72	419.3
8. Training	199.6	199.6	199.6	199.6	199.6	998.0
9. Social Mobilisation & Communication	196	196	196	196	196	980.0
10. Investigation	321.3	42	22	22	22	429.3
11. Development & Follow-up of Special Projects	242	75	75.3	75.3	75	542.9
TOTAL	16847.99	24295.78	19232.18	19232.09	20347.14	99,981.1

Source: NIP – MINSA data

Annex 3: Summary of the 2007-2011 Budget and Sources of Financing

COST CATEGORY	FINANCING SOURCE	Estimated financing per annum in US\$ (,000)					
		Base Year 2007	Year 1 2008	Year 2 2009	Year 3 2010	Year 4 2011	Total
1. Standardisation, Organisation, Coordination & Advocacy	National Funds (2.8%) Not financed (97.2%)	31.2	136.9	31.2	123.9	31.2	353,4
2. Operational Costs⁷	National Funds (96.5%) OPS (0.8%) Not financed (2.7%)	6989.2	7053.4	7006.4	7004.8	6992.2	35046.6
3. Vaccines & Supplies	National Funds: (45.2%) External Funds: GAVI, Others (38.9 %) Not financed: (15.9%)	8346.13	13572.72	10859.87	10907.19	12293.38	55,979.29
4. Cold Chain	National Funds (8.5%) Not financed (91.5%)	183	2624.8	559	277.7	228.2	3872.8
5. Epidemiological Surveillance	National Funds (1.6%) Not financed (98.4%)	91.96	177.76	92	178	91.96	631.4
6. Supervision	External Funds: OPS, GAVI (24.7%) Not financed (75.3%)	145.6	145.6	145.6	145.6	145.6	728.2
7. Evaluation	External Funds: OPS (4,1%) Not financed (95.9%)	102	72	72	102	72	419.3
8. Training	External Funds: GAVI, OPS (18.4%) Not financed (81.6%)	199.6	199.6	199.6	199.6	199.6	998.0
9. Social Mobilisation & Communication	External Funds: GAVI, OPS (51%) Not financed (49%)	196	196	196	196	196	980
10. Investigation	External Funds: PATH, OPS (74.4%) Not financed (26.6%)	321.3	42	22	22	22	429.3
11. Development & Follow-up of Special Projects	External Funds: GAVI (72.9%) Not financed (27.1%)	242	75	75.3	75.3	75	542,9
Total		16847.99	24295.78	19232.18	19232.09	20347.14	99,981.1

Source: NIP - MINSA data

Annex 4: National Vaccination Schedule for Nicaragua 2008

Vaccines	Disease Prevented	Vaccination Age	Number of Doses	Booster Dose
BCG	Severe Forms of Tuberculosis	Newborn	1 Dose	None
Oral Poliomyelitis Vaccine (OPV)	Poliomyelitis	2, 4, 6 months	3 Doses	An additional dose during each JPV for children from 2 months to 4 years
Pentavalent DTP/HB+Hib	Diphtheria, Tetanus, Pertussis. Hepatitis B, Meningitis and Pneumonia caused by Haemophilus Influenzae Type B	2, 4, 6 months	3 Doses	None
Rotavirus	Severe Diarrhoea due to Rotavirus	2, 4, 6 months	3 Doses	None
DTP	Diphtheria, Tetanus, Pertussis	18 months (One year from the third dose of Pentavalent)	1 Dose	None
MMR	Measles, Mumps, Rubella	12 months	1 Dose	One dose of MR in the Follow-up Campaigns (held every four years) for Children 1 to 4 years old
dT	Tetanus	6 to 9 years	1 Dose	If there is no record of having received Pentavalent, DTP or dT, 2 nd dose is applied at 8 weeks interval, 3 rd dose at 6 months, 4 th dose in one year after the 3 rd , and 5 th dose in one year after the 4 th .
	Diphtheria, Tetanus	= 10 years	1 Dose	
Influenza	Paediatric Seasonal Flu	6 to 23 months with chronic illnesses	2 doses when applied for the first time	Annual Vaccination
	Adult Seasonal Flu	= 65 years with chronic illnesses	10 doses	Annual Vaccination
Pneumococcal*	Diseases caused by Pneumococcus	2, 4, 6 months	3 Doses	none

* Introduction of Pneumococcal vaccine is contingent on receiving GAVI support in 2008.

Source: NIP - MINSA data