



**Pan American  
Health  
Organization**

Regional Office of the  
World Health Organization

**Comprehensive Family Immunization**  
*Family and Community Health Area*



# **TWENTY-SEVENTH MEETING OF THE CARIBBEAN EPI MANAGERS**

## **FINAL REPORT**

**Grand Cayman Island  
15-19 November 2010**

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# TWENTY-SEVENTH CARIBBEAN EPI MANAGERS' MEETING

## I. Introduction

The 27<sup>th</sup> Caribbean EPI Managers' Meeting was held at the Marriott Hotel and Resort in Grand Cayman, Cayman Islands, November 15 -19, 2010. About seventy persons participated in the meeting. The representatives were from twenty-three (23) island states and territories in addition to French Guiana, Martinique, Canada, USA, as well as international agencies such as the U.S. Centers for Disease Control and Prevention (CDC) and the Canadian Public Health Agency (CPHA). There were also representatives from the Ministries of Health, the Pan American Health Organization Headquarters (PAHO), CAREC and PAHO Office in Suriname.

The Chief Officer of Ministry of Health, Cayman Islands, Ms. Jennifer Ahearn welcomed the participants as she chaired the opening ceremony. The National anthem was performed by Mr. Oscar Calidonia and prayer by Mr. Timothy Mc Laughlin. Greetings and remarks were made by Dr. Cuauhtémoc Ruiz-Matus, Senior Advisor of Immunization, PAHO, Dr. Beryl Irons, Director of CAREC, Dr. Susan Reef of the Global Immunization Program, CDC and Mr. Andre Le Vasseur, of the Public Agency of Canada.

The keynote address was presented by the Honourable J. Mark Scotland, Minister of Health, Environment, Youth, Sports and Culture. He welcomed the participants and reminded us that worldwide immunization programmes prevent more than three million deaths annually. Besides preventing human suffering and disability, vaccination makes good economic sense and a cost-benefit analysis study in the United States showed that for every dollar invested in a dose of vaccine, up to USD 27.00 in health expenses are saved. The Caribbean celebrates 19 years without an indigenous measles case and in the Cayman Islands more than 60 years of immunization have eliminated almost all vaccine preventable diseases such as polio, diphtheria, pertussis, neonatal tetanus and measles. The country is proud of the public health officials who are committed and consistent in delivering a robust vaccination programme. The speed and frequency of global travel put all countries at risk of importation of diseases and vigilance and universal vaccination are necessary. He further encouraged attendees to ensure that vaccination has priority place in each country's political, economic and social agenda.

The vote of thanks was ably done by the EPI Manager, Ms. Alice-Jane Ebanks.

## A. Purposes of the Meeting

1. To share experiences and lessons learned at the regional, sub-regional, and national levels in order to enrich collective understanding, build on the successes, refine strategies, and define solutions for deficits detected;
2. To provide scientific, technical, and programmatic updates in order to ensure that immunization managers are positioned to answer relevant questions from Ministries of Health and other stakeholders;
3. To review current plans and outcomes and to develop new plans for the future, because planning and evaluation are important managerial elements for enhancing performance, mobilizing resources, and guaranteeing financial sustainability; and
4. To discuss and decide on timelines for the completion of country reports for the documentation and verification for the elimination of measles, rubella and congenital rubella syndrome (CRS).

## **B. Objectives of the Meeting**

The specific objectives of the 27<sup>th</sup> annual meeting of the Caribbean EPI Managers are as follows:

1. To maintain heightened surveillance of influenza and severe acute respiratory infection (SARI) in selected countries;
2. To discuss the H1N1 vaccination programmes that were implemented in response to the pandemic and seasonal influenza;
3. To analyze and evaluate the status of measles, rubella, and CRS elimination in the countries;
4. To sustain the eradication of wild poliovirus in each country;
5. To follow-up on poliovirus containment issues for the region;
6. To analyze the status of the EPI programme in each country;
7. To discuss the introduction of HPV vaccine and surveillance issues for the countries;
8. To discuss the introduction of vaccines such as pneumococcal and rotavirus in the EPI in countries, including strengthening of the surveillance systems;
9. To discuss status/improvement of surveillance of events supposedly attributable to vaccination or immunization (ESAVIs);
10. To set the targets and objectives of each country with respect to immunization coverage and reduction of morbidity and mortality from the EPI diseases for the year 2011;
11. To update information on selective scientific topics of common interest to countries in relation to immunization, delivery of services, and surveillance of measles/rubella and other EPI diseases;
12. To develop an action plan with a specific budget for each activity for each country to achieve the targets and objectives set for 2011.
13. To implement the PAHO Resolution CSP27.R2 to document and verify the elimination of endemic measles, rubella and CRS transmission in the Americas.

## **II. Universal Vaccination Coverage**

### **A. Overview of EPI: Achieving 95% Coverage in all Communities**

#### **1. The Americas**

The countries and territories of the Region of the Americas have made great advances in immunizing their populations; however, gaps in vaccination coverage still remain. When examining trends in coverage by WHO Region, using DPT3 as an indicator, coverage in the Region of the Americas has declined in recent years. There is a need to examine coverage rates at the sub-national level, as poor-performing municipalities can often be obscured by national averages. As the Region of the Americas strives to eliminate diseases such as measles, rubella and CRS, it is of critical importance that attention be paid to the local level, as the risks of low vaccination coverage are great and include: the reintroduction of previously eliminated diseases, such as polio, measles and rubella; the resurgence of diseases under epidemiological control such as diphtheria, pertussis, neonatal tetanus, hepatitis B and haemophilus influenza type b (Hib); an increase in the morbidity and mortality attributable to vaccine-preventable diseases; failure in the introduction of new vaccines and underutilized vaccines and social and political distrust towards the Expanded Program on Immunization.

Factors which can lead to population groups being left unvaccinated and highly vulnerable to health threats include: a non-existent national immunization policy; a lack of health services or difficulties in accessing those services that do exist; abandonment of the immunization programme; a lack of vaccines or regular immunization services; and persisting social resistance and myths.

A strong immunization programme with sustained financing needs to be able to sustain the regular programme, well as undertake supplemental vaccination activities and maintain strong epidemiological

surveillance. Immunization programmes should also be comprehensive in their scope of work and integrated in terms of financial and human resources and the strategies used to reach population risk groups and carry out other preventative interventions. Financial sustainability needs to be guaranteed at the national level with the coordination of strategic partners and leadership of the national health authority.

Two important tools to sustain and improve upon the successes of immunization programs in the Region are supervision and rapid coverage monitoring (RCM). Currently, only 22 countries in the Region report on the number of municipalities that receive supervision. Additionally, not all supervision instruments used in the Region are adequate and budgets are frequently limited. However, despite these constraints, there are good examples of the use of supervision in the Region and lessons learned can be taken away from these programmes.

RCM is another key tool for monitoring the progress of immunization activities in the Region, the methodology of which is widely known. Twenty-five countries and territories report utilizing RCM, however they are often not completed in a systematic manner and questions remain concerning how countries and territories utilize these results.

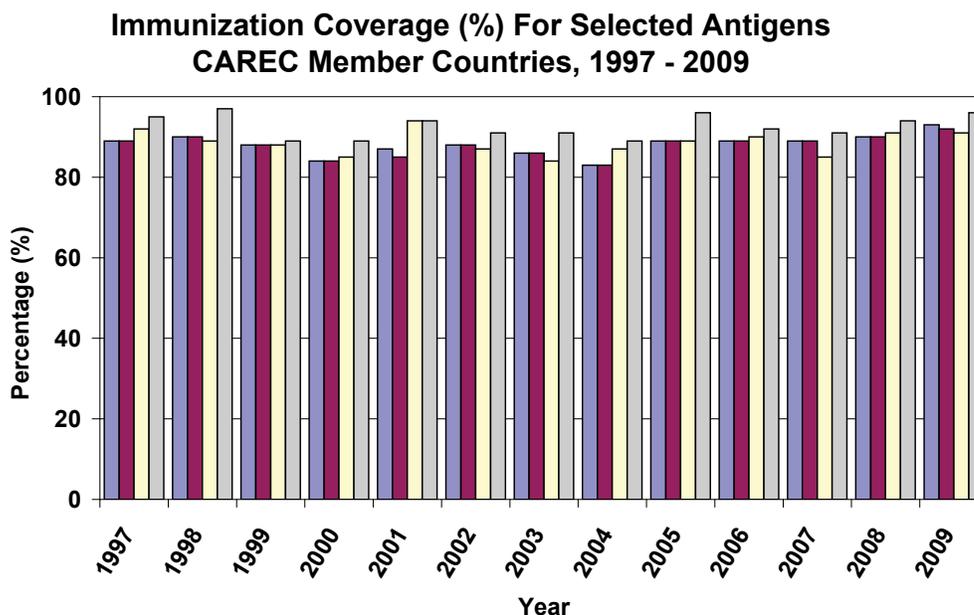
## 2. The Caribbean

The family immunization policy continues to be priority and many countries have developed the appropriate policy and expanded their target population to include adolescents, adults, elderly, and groups with special needs. Countries are gradually introducing the new and underutilized vaccines in the public sector immunization schedule.

Currently, three countries (Barbados, Bermuda, and Cayman Islands) have already introduced pneumococcal vaccines into their public sector schedules and Guyana has included pneumococcal vaccination for at-risk infant populations and should have full implementation by 2010/2011. Two additional countries, Jamaica and Trinidad and Tobago have included pneumococcal vaccination for at-risk infant populations and Trinidad and Tobago should have full implementation by 2011. HPV vaccines are available in Bermuda and Cayman Islands for adolescents on an optional basis. Rotavirus vaccine was introduced in the Cayman Islands in 2009 and in Guyana in 2010.

Achieving national coverage of 95% or more for each administered vaccine at each region, district, or zone level has been and continues to be the goal of the immunization programme.

For 2009, the average coverage for primary immunizations (3 doses of DTP, OPV/IPV, Hib, hepatitis B vaccines and 1 dose of MMR, BCG) for the Caribbean sub-region is DTP 93%, OPV/IPV 92%, Hib 93%, hepatitis B 93%, MMR-1 91%, and BCG 95% (Figure 1).



**Figure 1**

Marked increase in vaccination coverage for 2009 was noted especially for Jamaica and for the MMR vaccine.

Thirteen countries had vaccination coverage for DTP-3 of 95% or more, while all countries had coverage greater than 80% for all antigens (Table 1).

**Distribution of Vaccination Coverage (%)  
Caribbean Sub-region 2007 - 2009**

Vaccination Coverage (%)	No. of Countries DTP X 3 (0-11 months)			No. of Countries OPV X 3 (0-11 months)			No. of Countries MMR (12-23 months)		
	2007	2008	2009	2007	2008	2009	2007	2008	2009
< 50	0	0	0	0	0	0	0	0	0
50 – 79	0	0	0	0	0	0	2	0	0
80 – 89	4	6	1	4	6	2	5	4	2
90 – 94	4	5	7	4	5	5	2	6	6
≥95	12	8	13	12	8	14	11	9	12
<b>Sub-regional Coverage</b>	<b>89</b>	<b>90</b>	<b>93</b>	<b>89</b>	<b>90</b>	<b>92</b>	<b>85</b>	<b>91</b>	<b>91</b>

**Table 1**

In the five countries with population greater than 300,000, 3 countries have 70% and over of their geopolitical areas with vaccination coverage of administered antigens greater than 95% and all the other areas between 85 to 94%. In 2008, Guyana had achieved the goal of 95% coverage for MMR-1 in 6 of its 10 regions; Jamaica in 2 of its 14 parishes; and Trinidad and Tobago in 7 of its 8 counties as well as the island of Tobago. In 2009, Guyana achieved the goal ( $\geq 95\%$ ) in 7 of its 10 regions; Jamaica had achieved the goal of 95% coverage for MMR1 in 1 of its 14 parishes and 6 had 90-94% coverage and 81 to 89% in the other 7 parishes; Trinidad and Tobago achieved the goal in 5 counties as well as on the island of Tobago.

Vaccination coverage survey has been proposed for Trinidad and Tobago in 2010 was postponed to 2011 and data quality assessment was implemented in Jamaica in 2010.

**RECOMMENDATIONS- UNIVERSAL VACCINATION COVERAGE:**

- All countries should achieve and maintain vaccination coverage for all administered vaccines at 95% or higher, at national and sub-national levels (districts, parishes, zones, regions, etc).

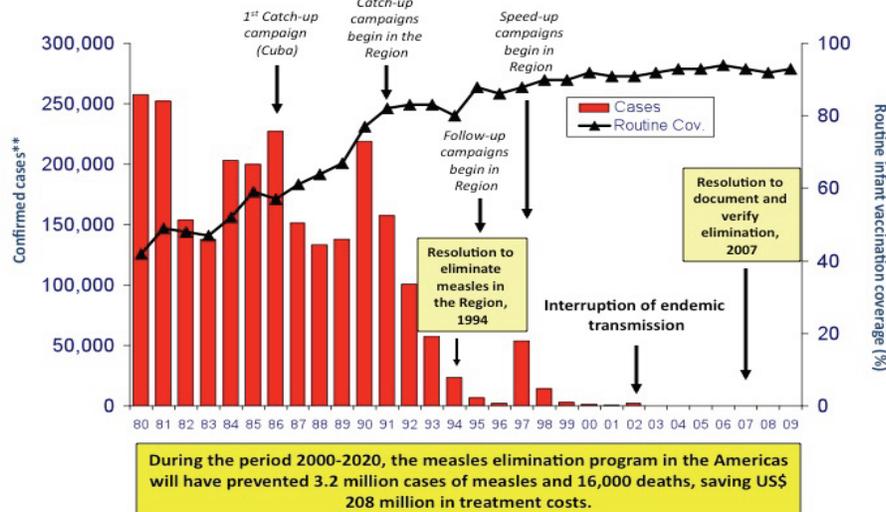
- Countries should use all available strategies such as community outreach, house-to-house and mop-up campaign to assist in achieving the goal of 95% or higher coverage.
- In order to sustain high vaccination coverage, countries will need to use all opportunities to administer vaccines in order to achieve the goal of increasing vaccination coverage to 95% or more. Appointments should not be necessary for a child to be vaccinated.
- A vaccination coverage survey is being recommended for Trinidad and Tobago. This should include MMR2 and Yellow Fever2 vaccination coverage and the Yellow Fever vaccination status of selected communities adjacent to forested (epizootic) areas.
- It was acknowledged that there were indeed problems and challenges with the delivery of vaccines from the manufacturers to the countries. The Immunization Program at PAHO Headquarters and the administration of the PAHO Revolving Fund will need to negotiate and discuss these issues with the shippers. Also shipment routes have to be looked at so that the shortest possible route is chosen for sending vaccines to countries.
- It was recommended by countries that there be enhanced communication between countries and the procurement unit of the PAHO Revolving Fund to ensure that invoices are sent in a timely manner.

### III. Progress of Measles, Rubella, and CRS Elimination

#### 1. Status of Measles, Rubella, and CRS Surveillance in the Americas

In 1994, countries of the Region of the Americas set a goal of interrupting endemic measles transmission by the end of 2000 through the adoption of Resolution CSP24.R16 during the XXIV Pan American Sanitary Conference. As a result of the countries of the Americas joining forces to attain the regional goal, the implementation of the effective elimination strategies led to the rapid decrease of cases, achieving the interruption of endemic transmission in 2002 (Figure 2).

Routine MCV1 Coverage and Measles Elimination Campaigns, the Americas, 1980-2009



\*Data until EW 52/2009. \*\*Prior to 1995, reported cases. Source: Country reports to PAHO.



Figure 2

The enhanced measles surveillance system, developed to support the regional goal of measles elimination, highlighted the significant widespread circulation of endemic rubella virus in many countries. In response, PAHO developed a rubella/CRS control strategy, which continued to evolve to one of rubella elimination that was supported and sustained through several PAHO resolutions. Rubella vaccination strategies were aligned with those of measles strategies through the use of the combined measles-rubella (MR) vaccine.

During the post-elimination era, measles cases have been reported in historically low numbers in the Americas: 119 in 2003, 108 in 2004, 85 in 2005, 237 in 2006, 176 in 2007, 207 in 2008, 89 in 2009, and 228 in 2010.<sup>1</sup> The highest incidence rate during this period was 0.26 per million people due to outbreaks in 2006. A main contributor to sustaining this success was the implementation of speed-up campaigns, an integral component of the rubella elimination initiative.

The Region of the Americas has successfully interrupted rubella virus transmission. The last instance of 1G transmission was in 2002, 1C transmission was finalized in 2005, and the last endemic rubella case, identified as genotype 2B, was reported in Argentina in epidemiological week 5/2009.

In many ways rubella elimination has served as a catalyst for maintaining measles elimination: speed-up campaigns reached susceptible adolescent and adult populations with the combined MR vaccine; countries were prompted to introduce the combined MR vaccine into their routine program; measles/rubella surveillance was integrated; increasing emphasis was given to the role of molecular epidemiology.

Outbreaks are just one of the many challenges confronted during the post-elimination era and are reminders that until measles and rubella eradication are achieved, countries in the Americas are at risk of importations. In 2010 measles cases have mainly been reported from a handful of countries and are suspected to be related to large international events. The cases from British Columbia, Canada are suspected to be linked to the 2010 Olympic Games, which took place in Vancouver in February of this year. For the majority of cases reported from Argentina and Brazil in 2010, the B3 virus genotype has been isolated. This genotype is consistent with the virus circulating in many southern countries of Africa.

Additional challenges for the Region include cases secondary to importation; reaching the unreached through high-quality follow-up campaigns; strengthening integrated measles/rubella surveillance and CRS surveillance and improving coordination with dengue surveillance in this stage of elimination; strengthening CRS surveillance and monitoring virus excretion from confirmed CRS cases; strengthening the role of the private sector; and correctly classifying false positives/negatives and limited samples for virus detection/isolation. PAHO, in collaboration with the countries, are implementing several strategies to overcome these challenges. **See Annex 1 for details.**

## **2. Review of Fever/Rash and CRS Surveillance in the Caribbean**

The interruption of indigenous measles virus circulation occurred in 2002 in the Americas and in 1991 in the Caribbean Community. Since then there have been imported cases with a recent imported and one import-related case in 2008 in Jamaica.

### *Case Reporting:*

Suspect measles, rubella, and CRS cases are being reported from over 700 sites in the Caribbean sub-region for 2010.<sup>2</sup> Ninety-nine percent of these sites report weekly and national reports include data from public and private health facilities, of which public sector sites account for 85-95% of total sites. Routine reporting of febrile rash illnesses continues from French Guiana (started in 2003), Aruba, and the Netherlands Antilles, which started reporting again in 2007. Saint Maarten sends reports weekly since 2010.

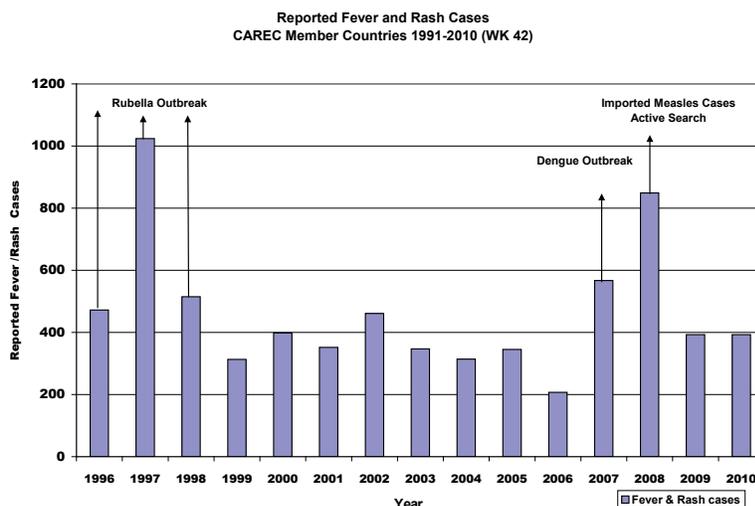
Almost 1,000 weeks (19 years) elapsed since the interruption of indigenous measles virus circulation occurred in the Caribbean Community in 1991 and in the Americas in 2002.

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<sup>1</sup> Data reported until epidemiological week 45/2010.

<sup>2</sup> Data reported up to epidemiological week 42.

Eight thousand seven hundred and forty-six (8,746) fever and rash cases have been reported between 1991 and 2010 (WK 42) – (reported cases ranged from a low of 207 in 2006 to a high of 1024 in 1997. **Figure 3.**

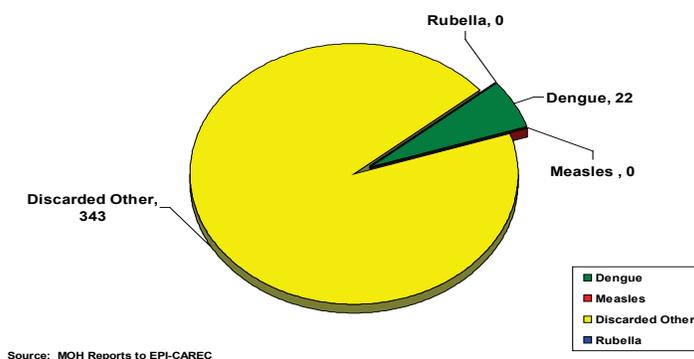


**Figure 3**

Seven confirmed cases of measles (imported from Europe and North America) occurred during the period 1991 to 2010 (WK 42). The last 2 cases (imported and import-related) were in Jamaica in 2008

Three hundred and ninety-three fever and rash cases were reported in 2010<sup>1</sup>, from 12 countries - Jamaica reported 68% of the cases, Belize 13% and Guyana reported 11% of the cases. Three hundred and forty-three cases (87.3%) were discarded as neither measles nor rubella, 22 cases (5.6%) were discarded as dengue and 28 are still being investigated. **(Figure 4).**

**Classification of Suspected Measles Cases, 2010 (Wk 42)**  
English Speaking Caribbean and Suriname



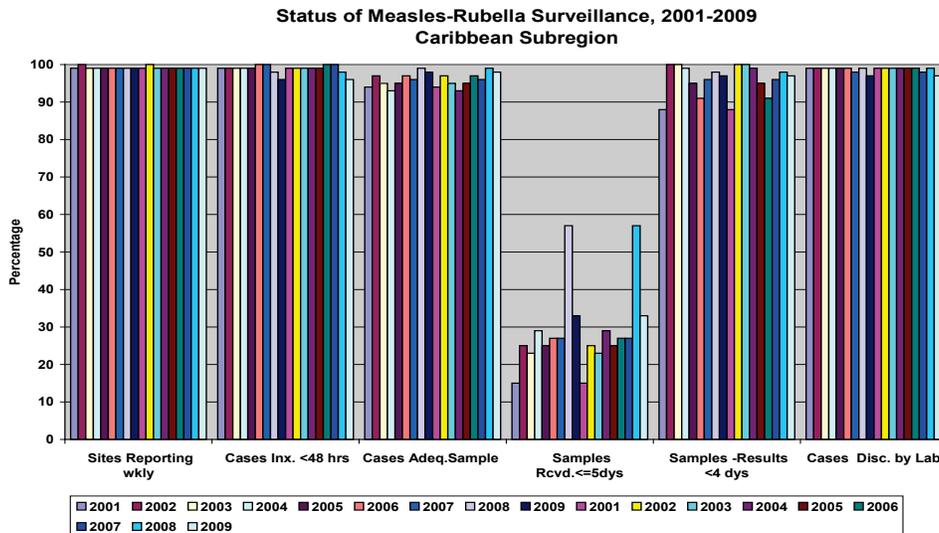
**Figure 4**

Thirty-one percent (31%) of specimens arrived at CAREC in less than five (5) days, post bloodletting. Countries are still being encouraged to ship specimens to CAREC as quickly as possible.

*Surveillance Indicators:*

In 2009, almost all (99%) of surveillance sites reported on a weekly basis with 100% of cases being investigated within 48 hours; 97% of cases had adequate samples taken and 94% received laboratory

results in less than 4 days. Ninety-six percent of cases were discarded on the basis of laboratory testing. Thirty-three percent of specimens were received at CAREC less than five (5) days after collection. For 2010<sup>1</sup>, almost all (99%) of all sites reported on a weekly basis and 99% of cases were investigated within 48 hours; adequate specimens were collected from 94% of cases; and 89% had received laboratory results in less than four (4) days. Ninety-seven percent of specimens were discarded by laboratory testing. Only 31% of specimens arrived at the CAREC laboratory in less than 5 days post-collection (**Figure 5**).

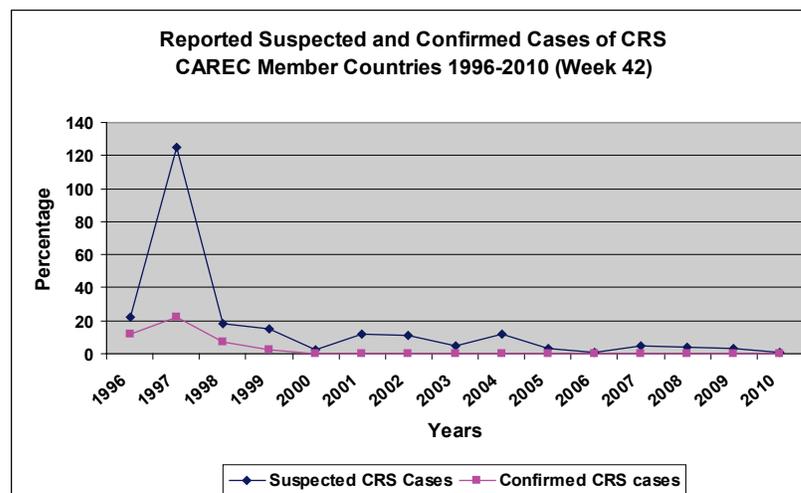


**Figure 5**

*Impact of the Rubella Vaccination Program:*

Cases of indigenous rubella were last reported in 2001, whereas, in 2008, an imported rubella case was reported from Bermuda and another rubella case from French Guiana. No case was reported in 2009 and 2010 (epidemiological week 42).

In 2010 (WK 42), 1 suspected case of CRS was referred for testing in addition to 10 cases referred for TORCH evaluation ((toxoplasmosis, rubella, cytomegalovirus, and herpes). All cases were discarded as negative for CRS from laboratory testing. The last indigenous CRS case in a CAREC member country was recorded in 1999. (**Figure 6**).



**Figure 6**

### 3. Country Reports

#### A. Trinidad and Tobago

Since the inception of the EPI in Trinidad and Tobago, the country has made remarkable progress in the administration of the programme. Trinidad and Tobago's measles and rubella elimination programmes have made substantial progress in meeting the goals both of PAHO/WHO and of CARICOM. Between 2000 and 2009, average reported vaccination coverage for MMR was over 90% percent for the target population.

Following the introduction of the rubella vaccine in the 1980's and subsequent mass immunization campaigns over the years, more than 500,000 persons have been immunized against measles and rubella. The MMR vaccine is the vaccine of choice.

#### B. Measles and Rubella Surveillance in Canada

The Canadian Notifiable Diseases Surveillance System (CNDSS), a passive surveillance system documented Measles/Rubella since 1924 (excl. 1959-68) and CRS since 1979. Enhanced surveillance started for measles since 1998 and rubella since 2006 through the Canadian Measles and Rubella Surveillance System (CMRSS) and Measles and Rubella Surveillance System (MARS, pilot project). Active case finding occurred during outbreaks. CMRSS includes active, weekly case-by-case notifications (including zero-notification) by provincial and territorial Ministries of Health and these are reported to the Canadian Measles/ Rubella Surveillance System.

For the period 2002-2009, a total of 228 confirmed cases were reported with an average annual incidence rate of 0.09 case/100,000 population (ranges from 0.02-0.31). **See Figure 7.** The high number of cases in 2007 and 2008 was mainly due to the large outbreaks in Quebec in 2007 (96 cases) and in Ontario in 2008 (53 cases).

##### Importation:

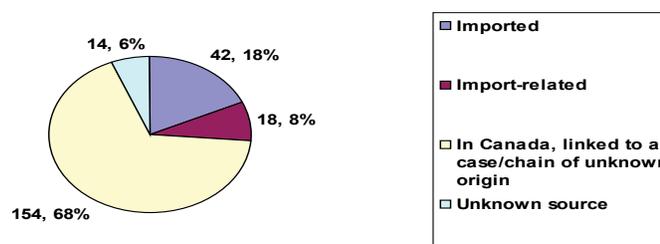


Figure 7

Among cases whose vaccination history is available (N=175): 84.6% (N=148) of the cases were individuals who have never been vaccinated and 15.4% (N=27) of the cases were individuals who have been vaccinated. Fifteen (15) or 8.6% were 1-dose recipients and 2.9% (N=5) were 2-dose recipients. Seven or 4.0% were vaccinated with no details of the vaccine history. The vaccination history of 53 cases is missing or unknown.

**Measles outbreak occurred in Vancouver, BC, 2010 during the Winter Olympics, 12-28 February 2010, Winter Paralympics, 12-21 March, 2010.** The outbreak started on March 10 and ended in April 2010 with a total of 82 lab-confirmed and epi-linked clinical cases reported. Three separate clusters of cases were identified as well as 42 sporadic cases in whom no contact with a known case was identified. At least 4 cases had a history consistent with exposure in a health care setting. The mean age of cases was 23 years (range 4 months to 64 years). Children and infants under 5 years of age were disproportionately affected, and were mainly unimmunized. Higher incidence was also observed among adults 30 to 39 years. Thirty one cases had unknown vaccination history; 30 were unimmunized; 9 likely had one dose of measles/mumps/rubella (MMR) vaccine and were under-immunized for age; 5 had documentation of one dose of MMR and were under-immunized for age; and 7 were two dose recipients (one of the two dose recipients was on immunosuppressive therapy).

**Rubella in Canada, 2002-2009 (preliminary):** National data of rubella cases were under-reported prior to 2006 as there was no enhanced surveillance. The preliminary data (2006 Canadian National Report on Immunization) of the outbreak in 2005 of rubella in south-western Ontario, began in a Netherlands Reformed religious community who have close ties to the same religious community in the Netherlands.

A total of 309 laboratory-confirmed cases were reported from the outbreak which started in early February and ended in late July. Children ages 5-14 years were the most affected and accounted for over 60% of the cases. 10 of the cases were pregnant women but no CRS cases were identified. The outbreak has been attributed to under-vaccination of persons within a defined religious community who are philosophically opposed to immunization.

From 2007 to 2009, there were a total of 9 rubella cases reported in Canada in which 6 were imported, and 1 import-related case (1 case from Egypt in 2007 – 1 case unknown source in 2008 – 2 cases in 2009 from Philippines (1 imported, 1 related to the imported case), Bangladesh (1), India, (1), Taiwan (1). Sri Lanka (1), 1 unknown source. Most of the cases had never been immunized. (6 not immunized, 1 immunized, 2 missing)

**Conclusion and Challenges:** Indigenous transmission of measles/rubella in Canada has been eliminated but there are continued challenges with achieving elimination of measles and rubella. There are still unimmunized or under-immunized people who are vulnerable to the diseases. Not all cases and importations were being detected and under-reporting is still one of the limitations of the enhanced surveillance system.

## 1. Recent Measles and Rubella Surveillance in the USA

The United States presented data on measles and rubella surveillance post elimination. Measles and rubella were declared eliminated in the U.S. in 2000 and 2004 respectively. Summary data were presented on measles from 2001-2008 that were published this week in the Journal of Infectious Diseases. During 2001-2008, a total of 557 measles cases and 38 outbreaks (ranging from 3-30 cases) were reported; a median of 56 cases (range 34-140) were reported annually. 232 (42%) of cases were imported from 44 countries. Almost a quarter of the cases were hospitalized and there were 2 deaths. The majority of cases (82% among US residents and 90% among foreign visitors) are unvaccinated or have unknown vaccination status. The median age of measles cases was 16 years however age distribution of cases varied from year to year depending on the age group affected by outbreaks. The highest age-specific incidence occurred among infants 6-11 months followed by children 12 -15 months. Almost all the cases in these age groups were unvaccinated but 20/58 of 6-11 month old infants and 11/24 children 12-15 months had traveled abroad and were not vaccinated in accordance with vaccine policy recommendations. This highlights the importance of educating physicians and parents on travel vaccine recommendations.

During 2009 and 2010 to date, 79 and 59 measles cases have been reported. In 2009, there were 21 importations from 7 countries (8 from the U.K.) and 12 additional cases where imported virus was isolated. There were 8 outbreaks ranging from 3-15 cases. In 2010 (through Nov 10<sup>th</sup>), 35 of the 59 cases were importations and 8 were imported virus cases. Only 9 cases have been epi-linked to these 43 cases. There have been 4 small outbreaks with 3-4 cases. The U.S. has more than 50 million visitors a year and therefore expects measles importations to continue until global measles control is improved.

Over the time period 2005 to 2010, the highest number of measles importations has been from the EURO region. In 2010, reflecting the large measles outbreaks in AFRO region, 8 measles importations occurred from this region. Two importations have been from the member states of PAHO: a case from Canada following the winter Olympics and one in an 11 month old child by who had recently returned from Panama. During 2008-2010, the highest number of measles importations have come from the UK (12) followed by Italy (11) and India (11). Most of the measles outbreaks that occur in the US have a measles genotype identified reflecting the source country: B3, D4, D5, D8, D9 and H1. Strategies to maintain measles elimination are to 1) maximize population immunity through vaccination; 2) assure adequate surveillance; 3) respond rapidly to outbreaks and 4) work to improve global measles control.

In summary, the US has maintained measles elimination over the last decade despite frequent challenges to population immunity through measles importations.

There is high population immunity to measles as a result of high vaccine coverage among pre-school aged children (1 dose) and school aged children (2 doses). Importations most frequently do not result in transmission but some importations result in localized outbreaks in unvaccinated sub-populations. Aggressive outbreak response by state and local health departments including quarantining of contacts limits the size of outbreaks. However, challenges also remain including lack of familiarity with measles among the public and health care providers, importations and outbreaks, sometimes sizeable, are expected to continue given status of measles control globally and travel to and from the United States, pockets of unvaccinated persons pose risks of measles outbreaks and responding to outbreaks is resource intensive at the local and state health department levels.

Rubella was declared eliminated in the U.S. in 2004. From 2005 to 2010 (to date), 60 rubella cases have been reported (3 to 16 cases per year) of which 24 are importations.

One outbreak of 3 cases occurred in 2005. The majority of the rubella cases are unvaccinated or have unknown vaccination status (most of these are adults).

There have been 4 reported CRS cases during this time period, 3 imported cases and one case acquired endemically, source unknown and no history of travel abroad during pregnancy.

#### **RECOMMENDATIONS- PROGRESS OF MEASLES, RUBELLA AND CRS:**

- Countries should exert all efforts to incorporate the private health sector in the measles, rubella and CRS surveillance system.
- Countries should have internal mechanisms for validating their surveillance system on a regular basis.
- Countries should ensure that appropriate mechanisms are in place for transportation of specimens within country and sending to CAREC in less than 5 days post collection.
- Countries should routinely maintain high, homogenous vaccination coverage (>95%) by municipality for the 1<sup>st</sup> and 2<sup>nd</sup> routine dose MMR, monitor the accumulation of susceptibles, and continue the implementation of high quality mop-up activities.
- Countries should achieve an adequate level of outbreak preparedness by developing national plans for preparation and rapid response to an importation and potential outbreaks.
- Countries should continue strengthening collaboration with the private health sector in measles, rubella, and CRS surveillance to support the rapid detection of importations and response to outbreaks and to strengthen immunization activities.
- Countries should ensure the completion and continuous monitoring of the recommended standardized measles/rubella surveillance indicators to attain high-quality surveillance, emphasizing high-risk and "silent" areas.
- Countries should continue to implement measures to increase sensitivity and quality of the CRS surveillance system to document suspected CRS cases.
- Countries should continue to sensitize health workers as to the signs and symptoms of measles, rubella, and CRS to ensure the timely reporting of suspected cases.
- Measles, rubella, and CRS cases should be classified after the laboratory and epidemiologic teams have reviewed all laboratory results and epidemiologic data.
- Social communication materials should be developed (e.g. posters) to highlight the following topics: the Region of the Americas has eliminated measles and rubella; importations continue to pose a risk to the countries; the benefits of immunization programs.

## **IV. Documentation and Verification of Measles, Rubella, and CRS Elimination**

### **1. Regional Overview of the Documentation and Verification of Measles, Rubella, and CRS**

The Member States of the Pan American Health Organization (PAHO) have a long-standing commitment to the eradication and elimination of vaccine-preventable diseases.

This pledge began with the eradication of smallpox and polio, and more recently targeted the elimination of measles by 2000, as well as rubella and congenital rubella syndrome (CRS) elimination by 2010.

The 27<sup>th</sup> Pan American Sanitary Conference adopted Resolution CSP27.R2 in 2007, which authorized the formation of an International Expert Committee (IEC) responsible for documenting and verifying the interruption of endemic measles and rubella virus in the Region of the Americas. In addition, the Resolution urged PAHO Member States to establish national commissions to collect and analyze the data for the documentation and verification of elimination that would be reviewed by the IEC.

Following Resolution CSP27.R2, a regional Plan of Action for documenting and verifying measles, rubella, and CRS elimination was finalized. The plan has an overarching goal of guiding countries and their national commissions in preparing the necessary evidence that supports the interruption of wild virus transmission. The regional plan of action was formally endorsed by the Technical Advisory Group on Vaccine-preventable Diseases (TAG) during its XVIII Meeting in August 2009. The following components are included in the regional plan: epidemiology of measles, rubella, and CRS; quality of surveillance; molecular epidemiology and laboratory activities; analysis of vaccinated population cohorts; sustainability of the National Immunization Program; and the correlation and integration of evidence.

Presently, Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, the French Departments, Guatemala, Honduras, Paraguay, and Uruguay have formed national commissions and the English-speaking Caribbean has established a sub-regional commission. Two additional countries have selected members however the national commissions have not be officially established. Finally, the eight<sup>3</sup> remaining countries should establish their national commissions as soon as possible so the region may continue to advance in the process (**Figure 8**). On 27 September Brazil became the first Latin American country to submit its final country report that verified measles elimination and documented the progress toward the interruption of endemic rubella virus transmission in the country.

The International Expert Committee is comprised of Louis Cooper (United States), Merceline Dahl-Regis (English-speaking Caribbean), José Ignacio Santos (Central America, Latin Caribbean, and Mexico), Walter Orenstein (United States), Isabel Pachón (Spain), Natasha Crowcroft (Canada) and José Cassio de Moraes (South America), who will assess the evidence presented by national health authorities, in collaboration with national commissions, to verify elimination at the regional level. The data compiled and analyzed by the national commissions should demonstrate that endemic measles and rubella virus transmission has been interrupted for three consecutive years since the last reported endemic case in the Region of the Americas. Countries should submit their final reports to the IEC by December 2011, who will in turn review the documentation and prepare the final report for presentation to the Pan American Sanitary Conference in 2012.



**Figure 8**

<sup>3</sup> In 2005 the United States declared endemic rubella virus transmission eliminated.

## **2. Summary and Conclusion of Caribbean Working Group for Measles, Rubella, and CRS**

A working group was convened to review and discuss the plan of action for the elimination and verification of measles, rubella and congenital rubella syndrome elimination in the Caribbean sub-region from July 27 to 29<sup>th</sup> 2010 in Barbados.

The meeting consisted mainly of presentations and work group sessions. These groups produced draft questionnaires, an outline for the proposed country reports and other documents, which outlined all the documents that countries would have to review and include in the national report.

The formulation of a national team was proposed for each country with specific terms of reference. The establishment of a Sub-regional Commission was also recommended. This Commission will review the national reports and eventually submit their findings and recommendations to the International Expert Committee. Letters will be sent to all governments informing them about the need to prepare a national report as well as to the Caribbean Pediatric Society to assist in obtaining relevant information for the report.

An outline of the evidence that should be included in the report is listed below:

- Epidemiological data for measles, rubella and CRS for 5 years;
- Case definitions;
- Laboratory results;
- Disease rates, information on outbreaks for the last 10 years, demographic data and vaccinated population cohorts;
- Sustainability of national immunization programmes; and
- Timelines for submission of the final draft by June 2011.

## **3. Progress of Documenting and Verifying Measles, Rubella, and CRS Elimination in the Caribbean Sub-region**

In October 2007, Resolution CSP27.R2 was adopted during the 27<sup>th</sup> Pan American Sanitary Conference. The resolution called for the establishment of an international Expert Committee and urged PAHO Member States to establish national commissions to document and verify elimination in each country. In August 2009, PAHO's Technical Advisory Group (TAG) on Vaccine-preventable Diseases endorsed a Regional plan of action for the documentation and verification of measles, rubella, and CRS elimination in the Region of the Americas. TAG went further to state that the documentation process presents an opportunity to place immunization programs as a high-ranking priority on the political agenda of countries and to strengthen vaccination activities and surveillance systems. TAG recommended that countries prepare and implement a national plan of action for the verification of measles, rubella, and CRS elimination, with technical cooperation from PAHO and the international Expert Committee. The key components to be evaluated during the documentation and verification process include the following:

1. Analysis of coverage with the measles-rubella vaccine in population cohorts aged <40 years.
2. Epidemiology of measles, rubella, and CRS and the impact of vaccination strategies.
3. Quality and efficiency of integrated measles, rubella, and CRS surveillance.
4. Analysis of virologic epidemiology and verification of the absence of endemic measles and rubella virus strains (through viral detection) in all countries of the Americas.
5. Sustainability of national immunization programs to maintain measles and rubella elimination.

A working group meeting was held in Barbados, July 2010, - reviewed and discussed the Plan of Action and outlined the issues involved. The group defined the activities required including instruments and or checklists for the elimination criteria. The group also defined the composition and Terms of Reference of the

Sub-regional Commission and developed a basic, yet comprehensive working document that describes the process of documenting elimination with the expected output being a model country report. The working documents were sent to countries to guide the initiation of the documentation and verification process in the countries. Countries were asked to form teams at national levels and develop plans for the in-country documentation and verification activities, as well as report writing.

The support of the Association of Caribbean Family Physicians and that of the Caribbean Paediatric Association are being solicited re the conduct of the survey utilizing the drafted questionnaires to be used in the verification and documentation of measles, rubella and CRS elimination.

National EPI managers are being offered support and guidance on the formation of national teams. Relevant documents and data are being provided.

A number of countries already established national teams – some used existing EPI committees or inter-agency coordination committee, while others are established teams as recommended by the working group.

#### 4. Country Report from St. Kitts/Nevis

Ministry of Health, St. Kitts/Nevis established a national team to work on the activities outlined in the Guideline for the Documentation and Verification of Measles, Rubella and CRS Elimination in the Region. An assessment team consisted of two professionals visited St. Kitts/Nevis during the period of 18-22 October 2010 and worked with the national team to complete the country draft elimination report. Structured questionnaires were used to interview paediatricians, obstetricians, ENT, ophthalmologists, director of public health laboratory, schools, societies and organizations for persons who are deaf or blind. Selected institutions were visited where facility logs, medical records and immunization registers were reviewed and health practitioners interviewed. The institutions included all hospitals on the islands, the main health centres and medical complex and the school for children with disabilities.

##### *Measles, rubella, CRS epidemiology in St. Kitts/Nevis*

Large outbreaks of measles during the first half of 1980s used to occur in St. Kitts/Nevis and later the Measles Mumps Rubella (MMR) vaccine was introduced in 1989.

Many strategies were adopted to interrupt the transmission of measles virus and eliminate indigenous measles infections (**Figure 9**).

Confirmed Rubella cases vs MMR coverage, St. Kitts 1980 – 2010\*

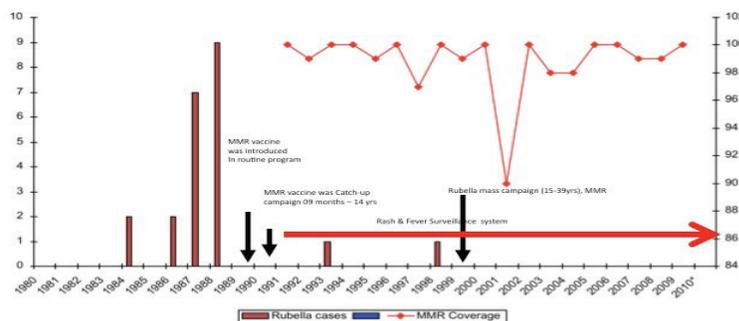


Figure 9

Measles mass vaccination month “Big Bang” was conducted in May 1991 and the surveillance system was established in September 1991. Measles follow-up campaigns were implemented in 1996 and 2001 and targeted children in the age-groups 1 to 5 and 2 to 5 years of age respectively. The country adopted the MMR 2-dose policy in 1997 and the MMR 2nd dose coverage data was available from 2001.

Several combined strategies have been implemented in St. Kitts and Nevis to protect the population against measles and rubella infection and that include routine vaccination with MMR at one year of age, a measles mass vaccination campaign targeted the age groups 9 months to 14 years (1991), two follow-up campaigns targeting mainly preschool-aged children (1996 and 2001) to provide a second MMR vaccination opportunity; and rubella mass campaigns targeting adolescent and adult men and women (including postpartum vaccination (1991-2000)). A 2-dose policy adopted – providing a second MMR dose for pre-school aged children.

There are twenty one (21) health facilities that are reporting sites (11 health centres and 3 hospitals in St. Kitts - 6 health centres and 1 hospital in Nevis. However, the doctors who work in the private sector report notifiable diseases from their private offices through the public sector and many doctors work in public and private sector. There is weekly routine surveillance for fever and rash as well as acute flaccid paralysis

Patients records for the period 2006 to 2010 (Wk 42) were reviewed and 3 cases of congenital cataract and glaucoma were identified (2 cataracts (1 bilateral) and 1 congenital open-angle glaucoma) all the 3 cases are residing in Nevis and the symptoms, signs and diagnoses were not supportive of CRS.

After using the essential criteria for elimination and the country epidemiological and surveillance data – the assessment team concluded that: The evidence presented in the report documented the interruption of the endemic rubella virus due to early introduction and use of the MMR vaccine and the many opportunities provided to the population cohorts 1 to 48 years of age to be vaccinated. There is a functioning rash and fever surveillance since the end of 1991 and also an excellent sub-regional laboratory.

## **5. Progress Reports from the Countries/Territories**

### **a. Guyana: Documentation and the verification of measles**

Guyana has started the process of the documentation and the verification of the measles. To-date the introduction/background section of the country’s report has been prepared as well as the data collected on the surveillance system. The country is expected to comply with the timelines set by the Working Group.

### **b. Belize**

Belize has established its national committee for the Documentation and Verification of Measles, Rubella and Congenital Rubella Syndrome Elimination. Members were selected based on recommendations given by the sub regional commission. Data collection has commenced, and timeline of each assigned task and completion of the country report has been established. The report writing will be carried out before the ending of 2010, and revision of draft report will be done in the first quarter 2011. Submission of country report is scheduled for May 2011.

### **c. Documentation and the verification of measles -French Departments**

In accordance with Resolution CSP27.R2, the Regional Health Agencies (Agences régionales de santé/ARS) of the three French departments in the Americas (DFAs per the French acronym) are quickly advancing in the documentation and verification process. The Commission for the Documentation and Verification of Measles, Rubella, and CRS Elimination in the DFAs was officially established on 24 September 2010 and nominated Dr. Philippe Quénel, Scientific Coordinator, Cire Antilles Guyane (InVS), as president. The Commission is comprised of a multidisciplinary team, whose members are epidemiologists, virologists, pediatricians, and immunization professionals. The commission’s geographical scope of work will be French Guiana, Guadeloupe, Martinique, and the two French overseas territories of St. Barthelemy and St. Martin.

The first meeting of the commission took place from 21-22 October 2010 in Fort-de-France, Martinique. The objectives were the following: to present the members of the Commission for the Documentation and Verification of Measles, Rubella, and CRS Elimination in the DFAs; to review and discuss the Regional Plan of Action for Documentation and Verification of Measles, Rubella, and CRS elimination; to define the activities required, including instruments for the elimination criteria.

Several points regarding the immunization program and measles, rubella, and CRS surveillance were highlighted in the context of the documentation process. France does not have an immunization program similar to the Expanded Program on Immunization (with the exception of French Guiana), with a single manager responsible for all vaccination activities. The national vaccination policy is set by the Ministry of Health and implemented by different entities in the field: maternal and child health services, private physicians, school nurses. In addition, most vaccination activities are conducted on a routine basis and not through the implementation of vaccination campaigns. In addition, MMR vaccine was introduced in 1989 in France, but is not a mandatory vaccine. Vaccination with MMR is conducted on a voluntary basis and is administered at 12 months of age for the first dose (or earlier at 9 months of age if the child attends daycare), while the second dose is administered between 12-24 months.

During the first meeting in October 2010, the commission reviewed each component of the regional plan of action to determine how data could be collected and analyzed according to the realities of the DFAs. **Annex 2** give more detail on the process.

A timeline was established by the Commission for the Documentation and Verification of Measles, Rubella, and CRS Elimination in the French departments in the Region of the Americas for completing the documentation and verification process.

#### **RECOMMENDATIONS DOCUMENTATION AND VERIFICATION OF MEASLES, RUBELLA, AND CRS ELIMINATION:**

- Despite the official documents sent to countries earlier in 2010, many EPI Managers reported that their officials have not received the documents regarding the commencement of documentation and reporting process. These documents should be re-sent to the Ministry of Health in the countries as early as possible.
- Concerning the documentation and verification process for the elimination of Measles, Rubella and CRS, the timelines mentioned by the working group were thought to be ambitious. Multi-tasking will be needed to achieve deadlines as a region.
- Countries are advised to start with the introduction and background section of the report and follow the timelines developed by them at the meeting.
- All countries should develop a work plan for implementing the documentation/verification process, which includes the establishment of a national team to carry out data collection and analysis activities at the country level and the submission of a final country report by June 2011.
- While the English-speaking Caribbean has made great progress toward preparations for documenting the interruption of measles and rubella virus transmission, special attention should be paid to the following areas when collecting and analyzing the data corresponding to the various components of the regional plan of action:
  - Data analysis and the presentation should focus on the relevant information supporting the documentation of interruption of measles and rubella virus transmission.
  - Data analysis and presentation should be built around a critical evaluation of the data to support elimination as outlined in the various components described in the regional plan of action to document and verify measles, rubella, and CRS elimination (i.e., epidemiology of measles, rubella, and CRS; quality of surveillance; molecular epidemiology and laboratory activities; analysis of vaccinated population cohorts; sustainability of national immunization program; and correlation and integration of the evidence).

- The essential relationship of the linkage between epidemiology and laboratory should be strengthened at all levels, especially in regards to the following: Epidemiology, Quality of surveillance, Molecular epidemiology, analysis of vaccinated population cohorts and sustainability of the national immunization programme.
- A detailed analysis and information are needed on clinically confirmed/clinically discarded cases, laboratory discarded cases, the last confirmed cases, and suspected and confirmed CRS/CRI cases, as well as a detailed description of the surveillance systems and the involvement of the private sector in surveillance activities. Regarding the Caribbean sub-region, the above information should apply to highly suspicious cases for measles, rubella and CRS.
- Organized data should be presented to document the quality of the measles/rubella and CRS surveillance systems, including retrospective case search and monitoring of surveillance indicators included in the regional plan of action stratified by state.
- Analysis of vaccinated population cohorts - the analysis should be presented by parish (or equivalent level) for unvaccinated persons, and coverage gaps should be identified along with strategies for resolving these gaps.
- A plan on how to achieve and maintain high vaccine coverage (>95%) for first and second measles-mumps-rubella vaccine doses at the local levels should be described, including plans for follow-up campaigns. In addition, a plan on how to maintain adequate surveillance to detect imported and sporadic cases, outbreaks, and CRS cases should be presented.

## V. Seasonal and Pandemic Influenza Surveillance Programme

### 1. Regional Perspective of Pandemic and Seasonal Influenza Vaccination Programme

Until 2004, only 13 countries and territories in the Americas had introduced the seasonal influenza vaccine into their public health systems. In the next four years, substantial increases have been observed in the uptake of the seasonal influenza vaccine and by 2008, 35 out of the 43 countries and territories in the Americas had included the vaccine into their public health systems. The previous experience with seasonal influenza vaccine significantly helped the Regional pandemic influenza vaccination strategy.

As of September 2010, the countries of the Americas have vaccinated over 200 million people, of which 139 million dose have been applied in Latin America and the Caribbean (LAC). In the United States 61 million doses were administered and in Canada 25 million doses were distributed.

Influenza vaccination was targeted especially to risk groups such as healthcare workers, persons with underlying medical conditions and pregnant women. In LAC, Argentina, Brazil, Cuba, Ecuador, El Salvador, Mexico, reached high vaccine coverage of approximately 95% of their target populations.

The majority of the countries of the Region have had access to the vaccine purchase through the PAHO Revolving Fund (RF), direct purchase, donations, or mixed purchases. Twenty-four countries purchased 20,560,970 doses of monovalent vaccine against pandemic influenza through the RF--17,526,810 doses unadjuvanted (Sanofi-Pasteur and Novartis) and 3,034,160 doses adjuvanted (Novartis). Four countries of LAC, Argentina, Brazil, Mexico, and Suriname procured approximately 140 million dose of vaccine directly from the manufacturing laboratories. **Annex 3.**

The World Health Organization (WHO) selected 11 countries in LAC to receive a total donation of 11,074,000 doses, of which 10,024,000 have already been received. Haiti was offered 1,000,000 doses of pandemic vaccine by WHO, but a final decision from Haiti is still pending.

The vaccination coverage ranged between the priority groups. The groups with greater coverage were the healthcare workers (with 101.2%) and persons with underlying conditions (with 119.8%). The numbers vaccinated were greater than that targeted for healthcare workers (191.2%) and those with underlying conditions (119.8%). The high coverage in the group of people with chronic diseases could also be due to imprecise estimations of the target population (the denominator). The group with lowest levels of coverage was pregnant women, with 67.1% (of the goal vaccinated). It is important to emphasize that the epidemiological evidence indicates that influenza during pregnancy leads to a significantly greater risk of

severe disease, including hospitalization and death, both to the mother and the fetus. This increased risk is especially observed in the 2<sup>nd</sup> and 3<sup>rd</sup> trimesters of pregnancy and in the first two weeks post-partum.<sup>4,5</sup> In this regard, the World Health Organization recommends the vaccination against influenza in all the stages of the pregnancy.<sup>6</sup>

As of 22 October 2010, the number of events supposedly attributable to the vaccination or immunization (ESAVI) reported in Latin America and the Caribbean related to the vaccination of the pandemic flu has been lower than what it is expected with seasonal influenza vaccine and no deaths have been found to be casually related to the vaccine. Data here presented are still preliminary, as national committees are still investigating and classifying cases. To date 7,696 events have been reported, of which 947 they have been classified<sup>7</sup> as serious events. Of the serious events, only 488 events have been classified as being related to the vaccine against pandemic influenza. Of the severe events, there were cases of anaphylaxis (0.3 per million of dose), which were found to be below the expected rate of 1 to 10 per million of applied doses. Furthermore, 34 probable cases of Guillain-Barré syndrome—GBS have been reported.

As of 10 August 2010, WHO had declared the end of Phase 6 of the Influenza Pandemic Alert and the shift into the post-pandemic period as pandemic Influenza (H1N1) has taken on more of the behavior and intensity of a seasonal virus. The pandemic Influenza (H1N1) strain has now been incorporated into the trivalent seasonal vaccine for 2010-2011.

## **2. A Sub-regional Status of Pandemic and Seasonal Influenza Programme**

The influenza surveillance system is an integral part of the surveillance of acute respiratory infection. Reports of acute respiratory infection (ARI) are submitted weekly from all CAREC member countries and severe respiratory infection (SARI) from 5 countries namely Barbados, Dominica, Jamaica, St. Vincent and the Grenadines, and Trinidad and Tobago.

The first cases of the pandemic influenza A (H1N1) virus were identified in the Caribbean Community in May 2009 and by the end of 2009, confirmed cases were reported from all countries and territories. There were 350 reported hospitalizations and 22 deaths due to the Pandemic Influenza A (H1N1).

In 2010, the incidence rate for ARI had its major peak in epidemiological weeks 34 to 42 and the increase observed is due to ARI cases in children aged less than 5 years. A similar picture is seen for hospital admissions for ARI that is SARI. Laboratory testing showed that seasonal influenza A (H3N2) is the predominantly circulating virus type with co-circulation of seasonal influenza B and influenza A (H1N1). Respiratory syncytial virus (RSV) was also identified, but mainly in children and the elderly.

## **3. Influenza A H1N1 Vaccination Programme—Success and Failure**

### **a. Suriname**

The administration of the H1N1 vaccines in Suriname was given according to the deployment plan activities. The successes were mostly in the field of commitment of political leaders, dedicated managers, organizations and health workers. Failures were mostly due to the social communication programme for the public as the epidemic had already passed and risk perception, was low. Human resources were also a constraint at all levels. Of the doses received less than 50% was deployed and 95% of that vaccine was used for vaccination. Overall 30% of the health and essential workers had been vaccinated and 10% of the pregnant women and 15% of the chronically ill. Of the healthy population 5-49 years age group, around 5% were vaccinated.

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<sup>4</sup> CDC. 2009 pandemic influenza A (H1N1) in pregnant women requiring intensive care - New York City, 2009. MMWR Morb Mortal Wkly Rep. 2010 Mar 26;59(11):321-6.

<sup>5</sup> Siston A et al. Pandemic 2009 influenza A(H1N1) virus illness among pregnant women in the United States. JAMA. 2010 Apr 21;303(15):1517-25.

<sup>6</sup> WHO. Strategic Advisory Group of Experts on Immunization – report of the extraordinary meeting on the influenza A(H1N1) 2009 pandemic, 7 July 2009. Wkly Epidemiol Rec. 2009;84(30):301-4.

<sup>7</sup> The classification of the cases is preliminary which means that there can be variations between every week, as countries are completing the process with Specialized National Commissions of classification of the cases.

## **b. Trinidad/Tobago**

In late 2009, Trinidad and Tobago began to experience an increase in the number of persons with flu-like symptoms. To date, there are 215 cases confirmed as pandemic influenza (H1N1) and 5 reported deaths. A national deployment plan was established for distribution of pandemic (H1N1) vaccine. Excellent communication activities were employed, including press releases, press conferences, media interviews, social media campaigns, use of Facebook, Twitter and YouTube, mass and direct mailing, as well as a call-in hotline, 800-well (9355). No cases of ESAVIs were reported that required medical attention. In spite of the press and media coverage there was a low utilization of the H1N1 vaccine, approximately 40% of the expected target group.

Lessons learned following negative publicity received during a dengue outbreak in Trinidad and Tobago helped prepare the Ministry of Health in their response to H1N1 pandemic. The Minister of Health was extremely careful and was able to develop an excellent relationship with the media.

### **RECOMMENDATIONS OF SEASONAL AND PANDEMIC INFLUENZA SURVEILLANCE PROGRAMME:**

- Countries should ensure that their sampling strategies are in place and implemented for the taking of specimens as a vital part of the surveillance system for Acute Respiratory Infections.
- The surveillance system for ARI and SARI should be enhanced and expanded to all countries.
- Countries in the region should be commended for the successful planning, introduction, and progress made with pandemic influenza H1N1 vaccination campaigns.
- Targeted risk communication strategies and enhanced ESAVI surveillance should be essential components of all vaccination campaigns.
- In the post-pandemic period it is important for countries and territories to remain vigilant, as the behavior of H1N1 as a seasonal virus is hard to predict and groups identified at risk during the pandemic such as individuals with chronic disease, pregnant women and health care workers, are likely to remain at heightened risk.
- Additionally, countries and territories should continue routine influenza surveillance and enhance monitoring for unusual events, such as clusters of disease or atypical cases. Clinical management of cases remains the same.
- Seasonal influenza vaccination should be strengthened for populations at risk.
- While the pandemic H1N1 vaccine had a strong safety profile, it will be important to continue to strengthen ESAVI surveillance.
- It is necessary to document and disseminate the lessons learned during pandemic H1N1 vaccination campaigns in the Caribbean sub-region.

## **VI. SUSTAINING THE GAINS**

### **A. Vaccination Week in the Americas**

#### **1. Overview of Vaccination Week in the Americas 2010**

In 2010, Vaccination Week in the Americas (VWA) was celebrated for the eighth time throughout the Region. Dating back to a 2002 proposal by the Health Ministers of the Andean Region for a coordinated vaccination effort across national borders to reach vulnerable populations, VWA has grown to be the largest multi-country health effort in the Western Hemisphere. VWA works to strengthen national immunization programs by targeting populations with otherwise limited access to health services, such as those in border and rural areas, urban margins, indigenous communities, and poor performing districts. Over the history of the initiative, VWA activities have resulted in the vaccination of more than 323 million individuals.

VWA has also provided a platform to raise population awareness regarding the importance of immunization campaigns and to keep the topic on the forefront of political agendas in the Region.

In 2010, VWA launching events and celebrations of different magnitudes occurred across the Americas, in major cities and towns, and on bi- and tri-national border areas. In terms of Regional level launching events, celebrations were held in Masaya, Nicaragua with the participation of the Nicaraguan president and First

Lady; celebrations were also in Las Cruces, New Mexico with US and Mexican high level health officials and in the Dominican Republic and Haiti, to highlight the relationship between these countries in response to the devastating earthquake in Haiti. VWA on the border between Suriname and French Guiana, with the participation of Brazilian authorities had the Director, PAHO, Dr. Mirta Roses as the guest of honor. This latter event marks the first ever bi-Regional launching event, linking together the Americas with France and the rest of Europe.

In 2010, the Regional slogan for VWA was “reaching everyone.” Countries and territories worked towards this goal by conducting a wide range of vaccination activities, immunizing more than 34.8 million people. Regional social communication materials took advantage of the upcoming World Cup and featured images of soccer star Ronaldinho and a schedule of World Cup games. Coordination between PAHO and the Sesame Workshop were also continued in 2010, and a series of posters and stickers were produced using the images of these population children’s characters.

2010 was also key year for the integration of other preventative interventions with vaccination, a trend led by the Caribbean sub-region. Thirteen countries and territories implemented some form of integrated activity this year, the most in the history of the initiative. Integrated activities included the administration of vitamin A, deworming treatment, iron and other nutritional supplements, provision of medical screenings for diseases such as diabetes and hypertension, dental check-ups and health fairs, among other activities.

The success of VWA has served as a model for other Regions of the World Health Organization (WHO).

As of 2010, Europe (beginning in 2005) and the Eastern Mediterranean Regions (beginning in 2010) were implementing their own vaccination weeks. In 2011, the African and Western Pacific Regions are planning to pilot their own initiatives, leading us much closer to a Global Vaccination Week in the near future.

## **2. VWA: Examples from the countries**

### **a. Bahamas**

The Bahamas celebrated VWA during the month of April, 2010. The initial plan was to immunize adults with DT, Hepatitis B, and MMR, however due to the fact that H1N1 vaccines were still available it was also added to the vaccines being offered.

The week started with a press release by Rt. Hon. Dr. Hubert Minnis Minister of Health, who shared plans for the week with the media. Printed materials for VWA were distributed to public and private clinics for display. Staff from the EPI Unit visited various media houses to educate the public and encourage them to receive their immunizations.

On Saturday 24<sup>th</sup> April, 2010 a church service was held at Centerville Seventh Day Adventist Church. Attendees included Dr. Merle Lewis, PWR Bahamas and Turks and Caicos, Dr. Pearl McMillan, Director of Public Health, other Ministry Officials and Staff of the EPI Unit.

During the week staff from EPI held immunization outreach activities at R.M. Bailey ballpark. Each day other programs (TB Surveillance, Chronic Non-Communicable Diseases (CNCD) and Healthy Lifestyle) within the Ministry of Health took part.

On Saturday 1<sup>st</sup> May, 2010 celebrations concluded with a Health Fair where immunizations were given to residents at the ballpark. Radio Bahamas and television stations were in attendance to assist with promotional activities. Also participating were our Non Governmental Organization (NGO), Bahamas Diabetic Association, The Cancer Society of The Bahamas and Bahamas Wholesale Agencies.

### **b. French Guiana**

French Guiana is an overseas region of France, consisting of a single overseas department with a population of 241,465.

The vast majority of the population (88%) lives close to three major cities and on the coastal strip (90.8%); 24.3% of the population lives along the border with Suriname. In terms of the population distribution, 14.6% of the population is under 5 years of age and 38.9% is under 18 years of age.

As an overseas department, French Guiana follows the official French immunizations schedule and recommendations. Medical doctors are allowed to administer vaccinations as are midwives (diphtheria, tetanus, poliomyelitis, acellular pertussis, hepatitis B, influenza and rubella for women; BCG for the newborns) but nurses are currently only allowed to vaccinate when it has been prescribed by a medical doctor. Changes to these limitations are expected to be made in the near future. There is no centralized system in French Guiana for coverage monitoring, therefore coverage surveys have to be employed; a large coverage survey will take place in 2011.

There is need for French Guiana to increase corporation with the neighboring countries of Suriname and Brazil in the area of immunization and in this spirit in 2010, an “international immunization week” was organized between French Guiana and Suriname with the participation of Brazilian authorities, as part of the celebrations of Vaccination Week in the Americas 2010. This event was the first ever bi-Regional (Americas-Europe) celebration to mark the initiative.

### **c. Suriname**

The joint launching of the VWA 2010 was the first ever bi-regional launch, linking the vaccination weeks of the Americas and Europe. The kick-off was given in French Guyana – Saint Laurent du Maroni and an official ceremony was held in Suriname- Albina, Marowijne District. For both countries, this joint activity meant acknowledgement of the efforts towards increasing collaboration between the countries. It also underlined the already good collaboration that exists between both health authorities.

Several activities were implemented during the Vaccination Week. The PAHO Director participated in the joint launching in French Guyana and in Suriname. Health workers from both countries came together in 3 sessions to learn about each other’s programs and discuss joint actions to improve vaccination in the border river area. The French Government donated 1,000 pocket folders to be distributed among the clinics along the river. These “pochettes” are to keep the French Carnet de Santé and the Surinamese Peuterboekje, along with the vaccination cards, together in one box, for direct availability to the parents, when visiting the clinic. The common pocket folder strives to gain the trust of the parents not to be afraid of repercussions for having two immunization books. A prototype of a common immunization card has been developed and will be further finalized with bordering countries.

A mop-up vaccination campaign in the Upper Amerindian Villages was done, bringing the vaccination coverage of these villages to 99.5%.The Regional Health Services implemented vaccination activities in a priority community with 300 household and a mop-up campaign in the village of Albina.



Selected participants at the 2010 bi-regional launching event during Vaccination Week in the Americas in French Guiana.

## **RECOMMENDATIONS- SUSTAINING THE GAINS:**

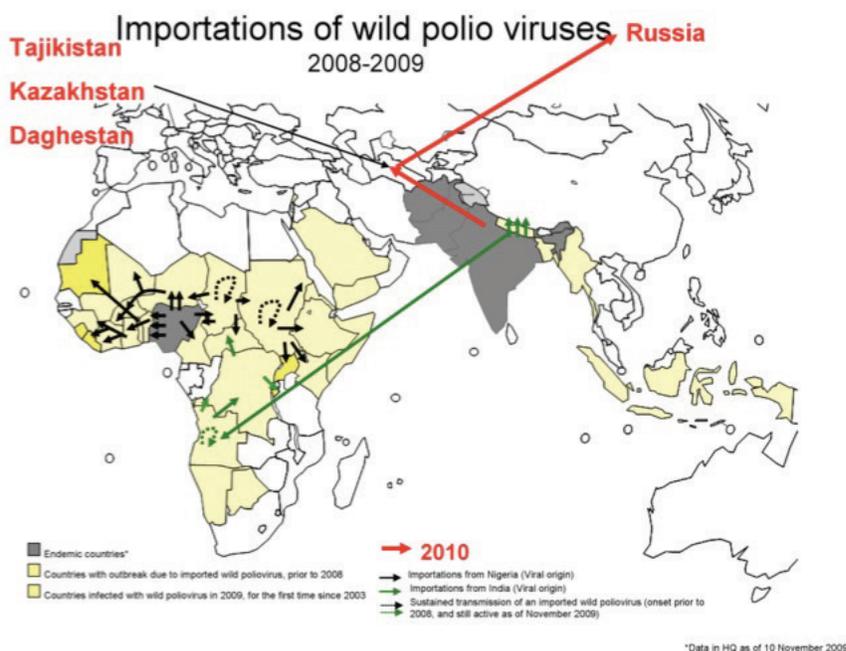
- Countries are requested to be thorough in their planning of the VWA 2011, and clearly identify the additional resources that are required.
- Countries requested for the materials for VWA 2011 be sent in a timely manner.
- Countries and territories should continue to participate actively in VWA activities, working to vaccinate vulnerable populations while highlighting the importance of disease prevention and health promotion in public forums and in the media.
- The integration of other preventative interventions with vaccination should be continued when appropriate.
- PAHO headquarters will advocate for earlier distribution of printed social communication materials.
- Countries and territories should continue to improve the submission of their VWA final reports to CAREC/PAHO headquarters in a timely fashion.

## **VII. Sustaining Polio Eradication**

### **1. Progress towards Polio Eradication and Poliovirus Containment**

The wild poliovirus continues to circulate in Asia and Africa. Recent exportations from endemic areas to Russia, Tajikistan, Kazakhstan and Dagestan, countries that were already polio-free, underscore the importance of maintaining an adequate surveillance system and high vaccination coverage. **(Figure 10).**

Once an importation occurs countries need to detect viral circulation in a timely manner. However, this will depend on the quality of the surveillance system. Countries that are not complying with the basic indicators of Acute Flaccid Paralysis (AFP) surveillance<sup>8</sup> will miss the opportunity for the early detection of circulation and will have to rely on high vaccination coverage levels at the national and district levels.



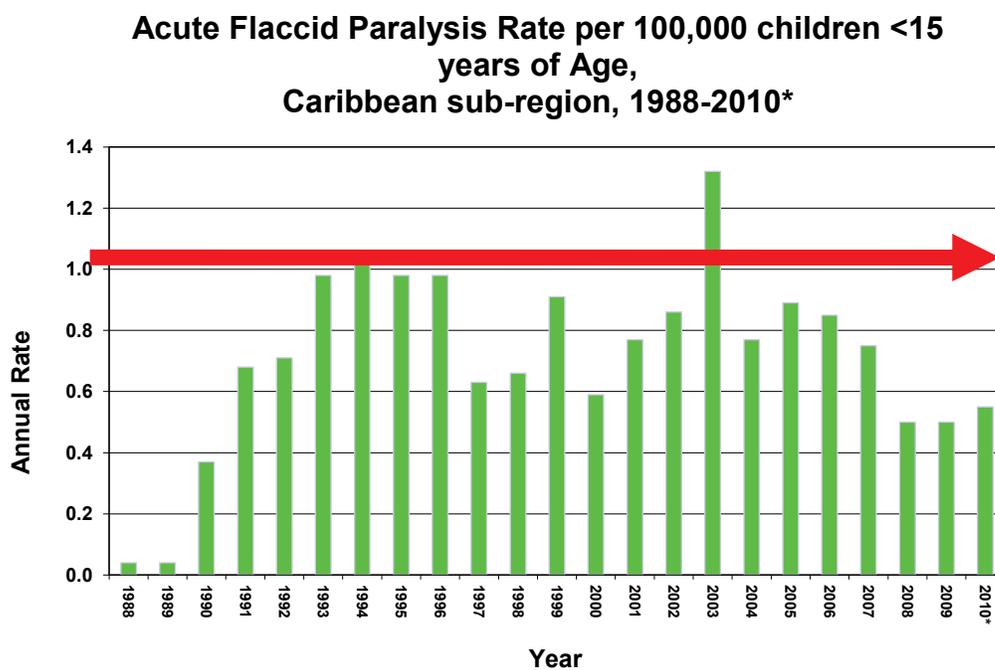
**Figure 10**

<sup>8</sup> AFP rate <1 per 100,000 < 15 years of age, and adequate stool specimens > 80%

## 2. AFP Surveillance in the Caribbean Sub-region

The Caribbean countries experienced the last cases of poliomyelitis due to wild poliovirus in 1982 and the countries have strived to maintain high OPV/IPV coverage and effective AFP surveillance. AFP reporting continues from 493 sites and 99% of these sites have been reporting on a weekly basis in 2010 (up to epidemiological week 42).

During the period 1994-2010 (Week 42), 283 AFP cases aged less than 15 years were reported from 10 countries. The annual AFP rates ranged from 0.50 to 1.32 per 100,000 population aged less than 15 years (**Figure 11**).



**Figure 11**

In 2009, 22 AFP cases with age range of 13 months to 70 years were reported from 5 countries: Belize, Guyana, Jamaica, Suriname and Trinidad & Tobago. Stool specimens were collected from the 10 cases aged less than 15 years; 60% of cases had specimens taken within 14 days of onset of paralysis.

In 2010 (up to epidemiological week 42), 20 AFP cases with age range of 16 months to 74 years were reported from 6 countries: Barbados, Belize, Guyana, Jamaica, Suriname, and Trinidad and Tobago. Eleven cases (55%) cases were aged less than 15 years, of which 9 cases had stool specimens collected within 14 days of onset of paralysis.

The annual rate of AFP cases per 100,000 population aged less than 15 years is 0.55, below the recommended rate of 1.0. The indicators of adequate stool specimens and annual AFP rate are directly related to the probability of early detection of importations of wild polioviruses from the endemic regions of the world. These two indicators are less than expected levels (**Figure 12**).

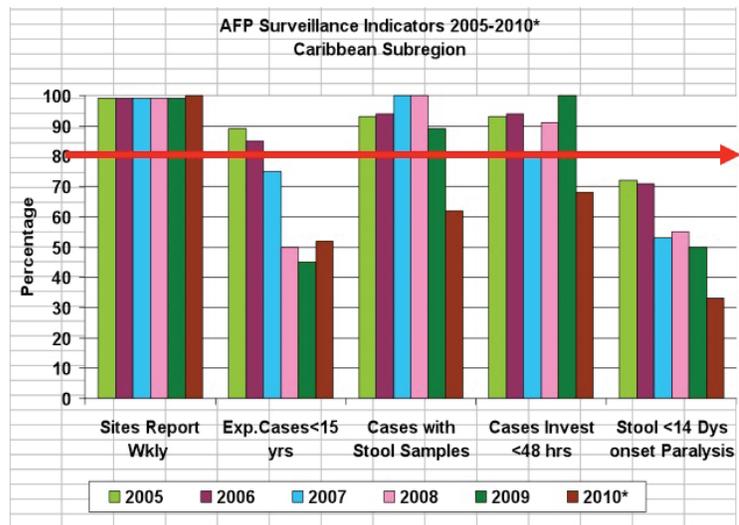


Figure 12

**RECOMMENDATIONS – SUSTAINING POLIO ERADICATION:**

- All hospitals (both public and private) should be included in the surveillance for acute flaccid paralysis (AFP), and ways need to be found to update the pediatricians.
- Internal evaluation and validation of the surveillance system for AFP need to occur regularly in each country.
- Countries are to make all efforts for all stool specimens for acute flaccid paralysis (AFP) to be collected within 14 days of onset of paralysis and improve timeliness of delivery to CAREC.
- In the Caribbean, there has been a decrease in the AFP rate, which is definitely a concern. Sensitization of clinicians on investigating AFP cases is of paramount importance.
- Significant progress has been made in some parts of the world in breaking the trail of transmission of Polio. Some countries remain a challenge. The Caribbean can partner with AMRO and AFRO for strengthening of national immunization programs. Persons who are interested in joining the STOP team are being encouraged to help by applying to assist with prevention of polio and other vaccine preventable diseases in the world.
- EPI managers must inform National Authorities, Professional Associations and Advisory Committees about the high risk of polio importations to region.
- The Caribbean countries are at risk of receiving an importation of wild poliovirus, which may lead to an outbreak if the importation is not detected in a timely manner and if vaccination coverage is below 95 % at the national and district level.
- Countries must take measures to achieve vaccination coverage > 95 % in every district, to conduct an active search for cases of APF and to comply with the AFP surveillance indicators (rate > 1 x 100,000 for the population aged <15 years old and adequate stool specimens collected in >80 % of AFP cases).
- AFP surveillance indicators must be analyzed on a quarterly basis.
- Conduct training on AFP surveillance with health workers in both the public and private sectors, emphasizing the importance of rapid reporting and the collection of adequate stool specimens. Instructional materials may also be prepared, such as posters about what to do if an AFP case is detected.

**VIII. New and Under-utilized Vaccines**

The introduction of human papillomavirus (HPV), pneumococcal, rotavirus, and vaccines should be decided based on demonstrated disease burden and cost-effectiveness. Additionally, logistical and financial sustainability also needs to be guaranteed.

PAHO's initiative ProVac provides processes and tools for evidence-based introduction of new vaccines and thus supports countries to ensure sustainable immunization approaches to address public health priorities. For pneumococcal and rotavirus vaccines, surveillance is a key underpinning of the introduction decision-making process as well as the post-introduction impact evaluation.

## **A. HPV Vaccine Introduction**

### **1. Update on HPV Introduction**

Since 2006, three (3) countries and two territories of the Region of the Americas have introduced universally human papillomavirus (HPV) vaccines in their national vaccination schedule: in 2006, the United States; in 2007, Canada and the British territory of the Bermuda; in 2008, Panama; in 2009, the British territory of the Cayman Islands. Mexico started in 2008 universal vaccination in the 125 municipalities (which represents roughly 5% of the country's municipalities) with the lowest human development index. Bolivia, Haiti and Peru carried out or are conducting studies to demonstrate the feasibility of HPV vaccination. Three Caribbean countries — Aruba, Guyana and Saint Lucia — are planning an introduction for 2011.

Cervical cancer burden is relevant in Latin America and the Caribbean. It is estimated that, in 2008, 67,755 new cases of cervical cancer occurred in Latin America and the Caribbean and 31,509 deaths (lethality = 46.5%) (WHO/IARC, Globocan 2008). Of those, 1,045 cases and 524 deaths occurred in six Caribbean countries (Barbados, Guyana, Jamaica, Suriname and Trinidad and Tobago; lethality = 50.1%). An estimated 9,161 maternal deaths occurred in 2008 in Latin America and the Caribbean: an estimated 3.4 women thus died for cervical cancer for each woman dying of complications related to maternity — a startling fact that highlights the need for greater mobilization and action towards cervical cancer prevention and treatment.

Despite the relevant burden of cervical cancer, uptake of the HPV vaccines is slower in the Region of the Americas compared to rotavirus and pneumococcal vaccines. Several reasons might concur to this situation, such as the need of EPI to focus on the introduction of rotavirus and pneumococcal vaccines (vaccines targeting pre-school aged children, the traditional EPI target population and focus of the ODM 4), the added complexity of reaching and vaccinating adolescents (an age group that has not traditionally been serviced by immunization programs), the perception that HPV vaccines remain very expensive, and concerns about the vaccine safety.

WHO published in April 2009 a position paper on HPV vaccines. Their introduction is generally recommended if cervical cancer prevention is a national public health priority and HPV vaccination is cost-effective, feasible and sustainable. As the vaccination goal should be cervical cancer prevention, WHO thus recommends that the primary target population should be girls before their initiation of sexual activity. This would generally correspond to an age of 9/10–13 years, but each country will have to adjust the target group depending on the local age of sexual activity initiation and feasible vaccination strategies to guarantee achievement of high coverage.

HPV vaccination should be introduced as part of a coordinated strategy of cervical cancer prevention and treatment that includes education about reducing behaviors associated with HPV infection risk and emphasizes the continued need for screening and early treatment of cervical cancer. Finally, it is recommended to seek integration with health initiatives and services for young people.

In November 2009, WHO organized a meeting to discuss two issues of particular concern in relation to HPV vaccination. While surveillance is a standard requirement for new vaccine initiatives, it is questionable whether "surveillance" in classical terms is feasible for HPV. Meeting participants considered six end-points through which impact of HPV vaccination could possibly be monitored but concluded that only two could possibly be feasible. On the short term, study of HPV infection prevalence could be implemented in defined areas of some countries and for a limited period (5–10 years). On the long term, only strengthening of cervical cancer registries will allow to evaluate the impact of HPV vaccination. Surveillance limitations make even more important robust systems to record manage and analyze HPV vaccination coverage.

Nonetheless, the wide age range over which HPV vaccination can occur and the variety of possible immunization strategies present specific challenges to accurate coverage data. It was concluded that the proportion of fully-immunized girls at 15 years of age could be the standard trend indicator to compare across countries.

This requirement will imply that, at each level (from the health care service or school where the vaccine is administered to the national Ministry of Health), yearly coverage data be collected and managed preserving stratification by age and identification of the dose number in the series.

HPV vaccines present the opportunities and challenges of reaching adolescents, an age group that immunization programmes have not been traditionally targeting. Although the Region of Americas has some experience in vaccinating adolescents in mass campaigns, limited experience exists in routine vaccination and minimal in school-based vaccination. While school-based HPV vaccination has permitted to achieve high coverage in the United Kingdom and Australia, countries should be aware that pilot studies in our Region indicate that this strategy can require significant financial and human resources. HPV vaccination strategies will need to be defined with an understanding of the particular developmental characteristics of adolescents. Communication and crisis management will need to be planned for carefully. In spite of the many challenges, HPV vaccination also presents the unique opportunity to integrate immunization programmes with other health initiatives/programs for young people.

Despite the general public perception, HPV vaccines are actually very efficacious and safe. The bivalent and quadrivalent HPV vaccines are both WHO prequalified. Clinical trials have now allowed follow-up for 6–8 years and protection against the two oncogenic HPV genotypes contained in the vaccines (genotypes 16 and 18, related to 65% of cervical cancer cases in Latin America) remain high (>95%). New information indicates that some level of cross-protection may exist against related HPV genotypes. Except for local reactions at administration site and fever, no adverse reactions are been reported world-wide despite intense post-marketing surveillance. In the USA, the Vaccine Adverse Event Reporting System (VAERS) has received 16,422 reports for the period from June 2006 to August 2010 (over 33 million HPV vaccine doses were administered during that period of time) and no new adverse event concerns or clinical pattern were identified. Always in the USA, the Vaccine Safety Datalink (a sentinel-based and active system that is more reliable than VAERS) permitted follow-up of over 600,000 vaccinated adolescents and adults. This analysis confirmed no significant risk of pre-specified adverse events after HPV vaccination, such as Guillain-Barré syndrome, seizures, syncope, appendicitis, stroke, venous thrombo-embolic disease and other allergic reactions.

While the bivalent HPV vaccine was offered in 2010 at US\$ 18.95 per dose by PAHO Revolving Fund — a significant price drop from previous prices, HPV vaccines is regarded by many countries to require a prohibitively high investment. Through its ProVac initiative, PAHO is developing a cost-effectiveness model that is expected to support countries evaluating the economic implications of HPV vaccination. During the second semester of 2011, it is anticipated that this model is going to be shared with managers of national EPI and cancer programmes.

## **2. Country Experiences from HPV Vaccination Introduction and Surveillance**

### **a. Bermuda**

The Bermuda Advisory Committee of Immunization Practices (BACIP) decided in 2007 that a HPV vaccine should be included in the Island's vaccination programme. This introduction was carried out in the framework of the retooling towards a comprehensive cervical cancer prevention and treatment programme. For instance, Pap smear coverage went from 76% in 2002 to 96% in 2006. According to the Bermuda's Cancer registry, no death attributed to cervical cancer was reported for the three years prior to October 2010.

While the quadrivalent vaccine was used for 2007–2009, it was switched in 2010 to the bivalent vaccines. HPV vaccine is generally well received in Bermuda. Factors that influenced vaccine usage include: significant population of guest workers from the USA and UK; large amount of students traveling to the USA for academy and tertiary education where HPV vaccine is often required; pediatricians strongly encouraged 11–12 year olds girls to get vaccinated.

No adverse reactions to HPV vaccination have been reported in Bermuda since the programme was initiated. Bermuda's experience highlights that coordination between vaccine monitoring and cervical screening is paramount in cervical cancer preventive strategies.

### **b. Cayman Islands**

The public sector in partnership with the Cancer Society commenced a pilot project for HPV vaccine in August 2009. A quadrivalent vaccine is used and the target group is 11–17 years old females. An informed parental consent was necessary and four questionnaires were developed; these forms were designed to rule out contraindications, capture side effects and provide vaccination information to the parents. Although the vaccine is offered at no cost, demand has not been high. Acceptance was mixed: whilst some parents felt HPV vaccine was good because it would prevent cervical cancer in their daughters, others questioned whether it would actually provide any protection and be safe. Despite enhanced surveillance that detected 11 events among the first 398 doses administered, the vaccine has found to be a safe. Although using an HPV vaccine is a quite an expensive undertaking, its administration will continue via the public sector and Cancer Society Partnership.

### **c. USA**

In the United States, quadrivalent HPV vaccine was introduced in 2006 for females primarily targeting ages 11–12. Bivalent vaccine became later available and is also recommended for females since October 2009. In October 2009, a permissive recommendation for males vaccination was enacted and firmer recommendations for males continues to be considered. Cost-effectiveness of vaccinating male is inversely related to vaccination coverage in the females population (male vaccination is not cost-effective in the US when coverage in females is >80%).

Whilst coverage is increasing (coverage with 1st dose in 2007: 25.1%; in 2009: 44.3%), significant drop-outs continue to be observed between each dose of the three-dose series (3rd dose in 2009: 26.7%). Vaccine is primarily being delivered in traditional primary care settings. However, adolescents have fewer preventive health visits than younger children and a substantial increase in health care visits will be needed to provide three doses of HPV vaccine. Alternative/complementary immunization settings are being explored and reconsidered. An early push for school requirements on HPV vaccination caused substantial political and public controversy. Significant perception barriers remain among health care providers and parents in the US. Percentage of pediatricians recommending HPV vaccine to females started to increase substantially after 13 years of age; mothers' intent to vaccinate their daughter also increased with age. Forty-seven percent of the parent felt that vaccine is too new and hasn't been around long enough.

## **3. Planning for HPV introduction in Guyana**

Guyana is preparing to introduce the HPV in 2011 through the partnership with IPPF, donation of 23,000 doses for the young girls 11-13 years old. This will be a school based programme. The government will share the logistics and the distribution cost of the vaccines in 2011. It is planned that in 2012, government will take on the responsibility of the vaccines.

A National Policy and Strategy for the Prevention and Control of Cervical Cancer 2009 -2012 was recently introduced in Guyana. In particular, Visual Inspection using Acetic Acid (VIA) testing was initiated in 2007 and is currently performed in 13 sites in the country in eight regions.

HPV vaccine introduction is planned for 2011 targeting girls aged 11–13 years via a school-based programme. As part of the introduction preparation, cold chain capacity is being reviewed at the regional level, approval is sought with the Ministry of Education, a small survey will be conducted in schools among the PTA to determine the willingness for such an intervention, and fact sheets on HPV will be prepared and socialized with teachers, parents and students. Programme costing as well as ESAVI monitoring and management are also being considered.

#### **4. Update on Proposed HPV Study Jamaica**

Jamaica has one of the highest burdens of cervical cancer in the sub-region of Latin America and the Caribbean. The two available HPV vaccines have been licensed for use in Jamaica but there was no clear evidence of whether the vaccine would be effective in Jamaica based on the genotypes which exist. Very small studies have been done to determine the HPV genotypes but while HPV 16 was found to be fairly common, several other genotypes other than those in the vaccines were more common. In order to justify the introduction of the vaccine into the routine Immunization programme, it was prudent to conduct a larger population based prevalence study to determine the HPV genotypes circulating in the country and to get the views of persons regarding their possible acceptance of the vaccine for themselves and their daughters.

With funding from the Sabin Vaccine Institute and technical and administrative guidance from PAHO and CDC, the study was done sampling 867 women ages 16-49 years in all health regions of the country. Oversampling was done in the 25-29 and the 30-34 years age groups as it was felt that these age groups would most likely have persistent HPV infection which would present as cervical cancer by age 40 years and over. The mean age of the participants was 31.8 years  $\pm$  9.2 years. The majority were single (40%) or in a common law union (21%) or visiting relationship (15%). Only 35% had ever heard of the HPV virus, the majority of whom lived in the capital/metropolitan area of the country. Only 28% had ever heard of the HPV vaccine, again the majority of whom lived in the capital/metropolitan area. 94% reported hearing of cervical cancer, most of who thought the disease was serious and common in Jamaica and that they were also at risk of getting the disease. 98% indicated that they would be willing to receive the vaccine or have their daughters aged 9-12 years get the vaccine. Of note only 71% of participants had ever had a Pap smear, the majority of whom were 30 years or older. 91% had a negative cytology result on Pap smear. Of the abnormal smears, 3.9% were low grade squamous intraepithelial lesions and 1.7% was high grade squamous intraepithelial lesions. LSIL was more common in the younger age group (under 25 years) and HSIL more common in those 40 years and over.

Preliminary analysis revealed that 37 different HPV genotypes including the common oncogenic types were detected in the samples and 29% had at least one high risk genotype. The four genotypes present in the vaccines were detected but with the exception of HPV 16, the others, HPV 6, 11 and 18 had lower prevalences than other genotypes. The most common genotype was HPV 52 followed by 16, 62, 83 and 61. Final analysis is pending. Additional cost analyses will be done before a decision is made regarding introduction of the vaccine.

#### **RECOMMENDATIONS-HPV VACCINATION INTRODUCTION:**

- Cervical cancer prevention programme was included in the 2009 meeting report as being major foci for 2010; this commitment should continue for 2011.
- Burden of cervical cancer and cost-effectiveness of HPV vaccination should be carefully evaluated in the Caribbean and this information should be used to advance the agenda on cervical cancer prevention and treatment in the Subregion – including HPV vaccination if evidence indicates so.
- More economic analyses, including cost-effectiveness or cost-benefit studies, should be conducted and supported with tools to be able to strengthen the justification for HPV vaccine introduction in countries of the sub-region.
- PAHO should provide assistance to develop cervical cancer prevention and treatment model programme to be implemented and evaluated in selected countries with small population size.
- Countries planning to introduce HPV vaccines must prepare an implementation plan that carefully addresses issues related to adolescent vaccination, ESAVI monitoring and crisis management, coverage data collection and management, cold chain capacity, logistics and training.
- Countries that are already carrying out HPV vaccination should improve their system for coverage data collection and management and document their experience in vaccinating adolescents.

## VIII. Pneumococcal and Rotavirus

### 1. Update and Regional Perspective on Pneumococcus and Rotavirus Vaccination and Surveillance Programme

Since 2006, fourteen (14) countries and two territories have introduced universally rotavirus vaccine in their national vaccination schedule: in 2006, Brazil, El Salvador, Mexico, Nicaragua, Panama, the United States, and Venezuela; in 2007, Ecuador; in 2008, Bolivia; in 2009, Colombia, Guyana, Honduras, Peru, and the British territory of Cayman Islands; in 2010, Paraguay and the French territory of Guadeloupe. The countries of the Region of the Americas were the first to introduce the rotavirus vaccine into their vaccination programs, and for the first time ever, a new vaccine is being introduced in developing and developed countries at the same time.

Since 2001, fifteen (15) countries and two territories have introduced universally a the pneumococcal conjugate vaccine in their national vaccination schedule for children aged <1 year.: in 2001, the United States; in 2002, Canada; in 2007, Costa Rica; in 2008, Bermuda, Mexico, Uruguay and the French territory of Guyana; in 2009, Barbados, Peru and the British territories of Cayman Islands; in 2010, Aruba, Brazil, Chile, Ecuador, El Salvador, Panama and Trinidad and Tobago. In the last three years, the pace of conjugate pneumococcal vaccines adoption by the countries in the Americas has clearly increased. Overall, eight countries have introduced both the rotavirus and the pneumococcal vaccines, eight countries only the rotavirus vaccine, and nine countries only the pneumococcal conjugate vaccine.

As emphasized above, surveillance is a key underpinning of the introduction of rotavirus and pneumococcal vaccines. Since 2004, PAHO's Regional Office has been working with member countries in the Region of the Americas to implement hospital sentinel surveillance of rotavirus diarrheal disease, promoting standardized case definitions, laboratory confirmatory processes, data analysis and evaluation. Sixteen countries in the Region now have sentinel surveillance and systematically transmit reports to PAHO; outcome and lessons learnt with this surveillance start to appear in peer-reviewed publications. For instance, one publication reports on specimens collected from 19,817 children in 54 sites (distributed in 11 countries) during 2006–2007 (de Oliveira et al., JID 2009, 200 Suppl 1:S131–9).

Of those specimens, 8,141 were positive for rotavirus; the median positivity percentage in the countries was 31.5% (range, 24–47%). The risk of death from rotavirus diarrhea by age 5 years was 1 of 2874. Strong rotavirus winter seasonality was apparent, even in tropical Central America. Globally common strains (P[8] G1, P[8] G9, and P[4] G2) accounted for >75% of strains, although unusual strains, including G12, were detected at low levels. As rotavirus vaccines continue to be introduced in Latin America and the Caribbean, maintenance of sentinel surveillance will provide robust pre-introduction data and a platform for estimating vaccine effectiveness and other measures of impact.

Several activities are being carried out in the Region to evaluate post-introduction effectiveness of rotavirus vaccination. For instance, a case-control study of monovalent vaccine effectiveness against childhood diarrhea was performed for cases reported from January 2007 to June 2009 in seven hospitals in cities across El Salvador. In particular, the study included 323 children aged <2 years admitted with laboratory confirmed rotavirus diarrhea and 969 healthy controls. G1P[8] strains were identified in 92% of rotavirus cases. Effectiveness of two doses of vaccination against diarrhea requiring hospital admission was 76% (95% CI: 64–84%). Protection was significantly lower among children aged 12 months or more (59%; 95% CI: 27–77%) compared with children aged 6–11 months (83%; 95% CI: 68–91%). One dose of vaccine was 51% effective (95% CI: 26–67%). At the sentinel hospitals, all admissions for diarrhea among children aged <5 years declined by 40% in 2008 and by 51% in 2009 from the pre-vaccination year 2006. It was concluded that rotavirus vaccination was highly effective against admissions for rotavirus diarrhea in children aged less than 2 years in El Salvador and substantially reduced the number of such admissions in this low-middle income setting. The impact on disease epidemiology after rotavirus vaccination warrants continued future study.

In the Region of the Americas, support is also being provided for an epidemiological surveillance network for pneumonia and bacterial meningitis cases in children aged <5 years.

This sentinel surveillance system is carried out in sentinel hospitals to support the specific information obtained through laboratory testing of samples in the SIREVA II network. As of 2010, nine countries

conduct epidemiological surveillance of pneumonia and bacterial meningitis and regularly report the information to PAHO. Additionally, Brazil reports data on hospitalized cases of bacterial meningitis. In 2008, 8,829 suspect pneumonia cases were hospitalized, 79% of them with a chest x-ray, and classified as probable bacterial pneumonia, with a case-fatality of 5%.

Several activities are ongoing in the Region of the Americas. Trends in diarrhea hospitalizations are being evaluated in Bolivia, Colombia, Ecuador, Honduras and Venezuela; rotavirus vaccine effectiveness is further investigated in Bolivia, El Salvador and Nicaragua. Studies on post-marketing rotavirus vaccine safety are being conducted in Brazil and Mexico. Effectiveness of 10-valent pneumococcal conjugate vaccine is evaluated in Brazil. The introduction of rotavirus and pneumococcal vaccines is being documented in Bolivia, Brazil, Nicaragua, Peru and Venezuela. Programmatic post-introduction evaluation of rotavirus and pneumonia vaccines was done in 2009 in Ecuador, and a pilot evaluation of bacterial pneumonia and meningitis was carried out in 2009 in the French territory of Guadeloupe. Rotavirus and pneumococcal vaccine introduction was also included in the international EPI evaluation carried out in 2010 in Bolivia and Nicaragua.

Rotavirus vaccine and pneumococcal conjugate vaccine are being introduced in the Region of the Americas at an accelerated pace that is unprecedented for new vaccines. Increased knowledge on effectiveness, impact and safety is being generated and, at least for rotavirus vaccine, starts to be published. Many lessons are learnt in the process: for example, the need for adequate evaluation of the cold chain and the logistics of the immunization program prior to introducing a new vaccine, the need for training at all levels, the importance of strengthening the network for ESAVI reporting and investigating, the importance of ensuring the sustainability of the vaccine in the national budget, and the establishment of surveillance prior to the introduction of the vaccine and the subsequent maintenance of that surveillance as fundamental to decision-making. Another lesson learnt was the importance of having the country-specific information, which stressed the importance of conducting special studies on cost effectiveness, effectiveness, and safety (which is also unprecedented in developing countries).

## **2. Planning for introduction of pneumococcal vaccines in Special Groups - Jamaica**

Introduction of new and underutilized vaccines such as the pneumococcal conjugate vaccine is one of the goals of the Global Immunization Vision and Strategies as well as an objective of PAHO. Planning for the introduction of new vaccines requires adequate documentation of the burden of disease in the country, the perception of risk, ensuring vaccine availability and quality as well as the capacity of the Immunization programme to facilitate the introduction. Cost benefit and cost effectiveness studies are also useful to guide the decision about the introduction of new vaccines.

Studies have indicated that black persons are more susceptible to invasive pneumococcal disease than white persons and that individuals with asplenia especially those with sickle cell disease are at an even higher risk of acquiring pneumococcal infections. Various studies conducted in Jamaica indicated that the prevalence of invasive pneumococcal diseases was 35 per 100,000 children under 5 years with 88% of cases occurring in children under 2 years. Pneumonia and meningitis were the most common presentations. Some 20% of cases had underlying diseases such as sickle cell and HIV infection. Pneumococcus accounted for some 30% of sepsis in HIV infected children. Evidence also revealed that children with sickle cell disease who received pneumococcal vaccination had a 54% reduction in the incidence of pneumococcal infections and those who still developed the infections had much milder courses. It has been accepted by the national programme and the Paediatric Association that prevention of invasive pneumococcal disease is a public health priority.

The current cost of the vaccine makes it prohibitive for universal introduction into the Immunization programme but introduction for the high risk groups such as infants with sickle cell and HIV infection is sustainable and can easily be incorporated in the programme.

This information was used to justify the decision to introduce the pneumococcal conjugate vaccine for infants with sickle cell disease as of January 2010 and to extend this to infants infected with HIV as of January 2011.

### **3. Experience from the Implementation of Rotavirus and Pneumococcal Vaccines - Guyana**

Guyana commenced the use of PCV 7 in April 2009 for children with special needs. Three doses were given. For the Rotavirus vaccines. In March 2010, the RotaTeq vaccines were received from GAVI. This was introduced in a phased programme in all regions.

In Guyana, nearly 1 in 5 cases of diarrhea is estimated to be caused by rotavirus. Although the vaccine was awarded in 2008 by GAVI, it was not delivered until April 2010. Only then, the pentavalent rotavirus vaccine could be added to the national immunization schedule for universal administration to children aged 2, 4 and 6 months. Programmatic adjustments that were required for the rotavirus vaccine introduction included a modified WHO Growth Charts as well as the EPI reporting format to accommodate registration of the administration of new vaccines. Sentinel surveillance was strengthened. The response from the private sector to the introduction of new vaccine was very positive. Important lessons learnt from rotavirus vaccine introduction in Guyana are summarized as follows: new vaccines training should only be held when the vaccines actually arrive in the country to minimize time investment and cost of retraining; efforts have to be made during the initial phase of the introduction to monitor adverse events; and continuous monitoring of the ordering and uptake by the regions is important. Guyana Ministry of Health and PAHO will continue to work together to monitor intussusception cases that are temporarily related to rotavirus vaccination.

Likewise, pneumococcal conjugate vaccine was awarded in 2008 by GAVI to Guyana. However, delays were experienced in its delivery to the country. Consequently, remaining funds from GAVI were used in 2009 to procure 1,000 doses through PAHO's Revolving Fund and was administered to children with special needs (children with splenectomy, immunosuppressed or malnourished). Universal vaccination with PCV13 vaccine is slated to begin in Guyana in 2011. Based on the rotavirus vaccine experience, the training for PCV13 vaccine would only be done when the vaccines actually arrives in the country. GAVI and PAHO should work closer in the future on the timeliness of countries awards and when the vaccines are delivered to the countries.

#### **RECOMMENDATIONS - PNEUMOCOCCAL AND ROTAVIRUS:**

- Sentinel surveillance for pneumococcal and rotavirus in the countries is critical for identifying circulating sub types.
- Countries are encouraged to develop sampling strategy and submit specimens to CAREC for sub typing.

#### **TAG Recommendations:**

- Countries planning to introduce new vaccines must prepare an implementation plan to include logistics, training, and cold chain capacity, as well as ESAVI monitoring.
- Surveillance based on hospital sentinel sites remains a key element to provide country-specific data that inform introduction decisions and allow vaccine effectiveness and impact evaluation. Thus, implementation or strengthening surveillance throughout the Caribbean is essential. If surveillance is already implemented, efforts need to be directed at improving surveillance data quality and to report periodically to PAHO's regional level.
- Countries are to send stool specimens to CAREC for rotavirus genotyping. If rotavirus testing is done in countries, then stool specimens that are positive for rotavirus should be sent to CAREC.
- Surveillance should be enhanced and continue to be used to assess circulating types and antibiotic resistance patterns for pneumococcal organism causing invasive disease.

## **X. Sustaining Immunization Programmes**

### **A. Country Plans to Increase Vaccination Coverage to >95%**

## **1. Jamaica:**

Over the past 10 years, Jamaica has not been able to achieve the required 95% coverage for all antigens in the Expanded Programme on Immunization. Despite the well known and implemented strategies of vaccination through a wide array of services such as fixed immunization clinics, outreach sessions and house to house vaccination as well as attempts to reduce missed opportunities and widening the collection of immunization coverage data from the private sector, the coverage remains below 95%. Various evaluations conducted by PAHO such as a vaccine coverage survey done in 2005 and a data quality audit conducted recently, indicate that the coverage is higher than that being reported and that the quality of the data management system needs to be reviewed.

Despite these findings, Jamaica needs to make more effort at improving vaccine coverage by doing the following:

1. ensuring the implementation of daily instead of weekly immunization clinics in the larger health centres
2. better use of house to house vaccination to reach immunization drop-outs
3. reducing missed opportunities by insisting on presentation of the immunization card at each child's visit to the health centres and
4. maximizing efforts at collection of immunization data from all private sector physicians giving vaccinations

### *Data Quality Self-assessment: Findings and Recommendations:*

Following the evaluation of the Immunization programme in Jamaica in 2003 and the vaccine coverage survey in 2005, a data quality audit was recommended for Jamaica by PAHO as there was evidence that the immunization coverage being reported annually was actually less than the reality and that the quality of the data needed reviewing. In November 2010, the data quality audit was conducted in at least one randomly selected parish in each health region and the parish with the highest target population and the greatest number of private physicians. Standard instruments were used to evaluate both quantitative and qualitative aspects of the programme.

The findings revealed that while the parishes seemed to be managing the programme fairly well, monitoring and evaluation at the health centre and parish levels especially needed improvement. The absence of standardized tally sheets for use at the health centres as well as the manual recording of doses of vaccines given at all levels introduced the possibility of errors at each level. In many health centres, more doses of vaccines given were found compared to what was recorded on the monthly summary report submitted to the parish health department. Likewise, in some parishes there were more doses of vaccines verified than what was recorded on the monthly summary report submitted to the national level. The outdated database being used at the national level does not function well in many parishes and does not facilitate more meaningful analysis of the coverage data especially with respect to drop-out rates and coverage analysis by smaller geographical areas. One of the main recommendations is for a review and revision to the database to upgrade it and facilitate electronic transfer of the data from parish to national level and for the development of a standardized tally sheet for use at all health centres. It was also recommended that more training be done with the private sector to ensure that they report coverage data in the standard way using the forms provided.

## **2. Suriname**

Several challenges exist in increasing vaccination coverage in Suriname. They include: denominator problems regarding district/region; population migration from district to district or to neighboring countries; socioeconomic factors which prevent parents from bringing in their children in for vaccination; parents being unaware of vaccination benefits available to them; a certain distrust in the EPI program and vaccines due to prior ESAVI cases; inconvenient clinic opening hours/days for working parents; and issues with logistics and limited geographical access to vaccination services for those individuals who live in remote areas such as the hinterland.

Multiple strategies will be used to increase coverage in Suriname. They include:

1. *Targeted immunization activities:*
  - Identification of the low coverage areas and coverage validation
  - Identification of the target population by region
  - Implementation of information/education/social communication campaigns which will be conducted in local languages through TV spots, radio programs and newspaper articles, and flyers in school
  - Activities to increase the awareness of the general population and of health workers regarding the importance of vaccination
  - Implementation of the national database, which is currently in a pilot phase
  - Vaccination of all children visiting clinics, regardless of whether the primary objective of their visit was for vaccination
  - Participation of health authorities at the local level and strengthened collaboration with neighboring countries
  - Dissemination of information to communities on vaccination and ESAVI and to targeted groups with low coverage
2. *Vaccination campaigns: communities with low coverage*
  - Identification of gaps within communities/clinics
  - Appointment of a campaign committee
  - Approval of campaign plan with associated timelines
  - Identification of implementing partners and securing their commitment
3. *Social mobilization activities during campaign and targeted activities*
  - Vaccination Week 2011 will provide the major momentum needed to start with social mobilization activities
  - Local political activists, sports ambassadors, Church leaders, Women's groups will play a major role in the promotion of immunization
  - A poster design competition will be conducted by the community/ schools/ women's groups

## **B. ESAVI Surveillance**

### **1. Overview of ESAVI Surveillance in the Americas**

As vaccine coverage has increased and the incidence of vaccine-preventable diseases has fallen or eliminated, immunization has become a victim of its own success. Loss of public confidence in a vaccine due to real or spurious links to adverse events can curtail or even halt immunization activities, with potential disastrous consequences.

From the perspective of immunization programs, the main objective of immunization safety is "to maintain the public's trust in vaccination." Vaccines that are administered in the region are prequalified by the World Health Organization (WHO), and they are subjected to quality control in the country of origin, as well as in the country that receives them. We are aware of potential vaccine reactions, but the vaccines that are administered in our Region are high quality. So what can generate mistrust in the population is a crisis.

In this light, during 2010 PAHO has been working diligently to support the country efforts which strived to strengthen their vaccine safety capacity. In this context, PAHO conducted several workshops aimed to develop and strengthen local capacity on ESAVI monitoring, causality assessment and corrective action. Workshops were conducted in St. Lucia, El Salvador, Guatemala, Peru and Cuba.

In the St. Lucia Workshop, staff from the National Regulatory Authority (NRA) from Jamaica and Suriname also participated. We have developed up-to-date information documents for a wide diverse audience in several vaccine safety topics, such as myths and truths on H1N1 (2009) pandemic vaccine.

Recent events, such as the response to the pandemic H1N1 (2009), raised global awareness about the importance of monitoring ESAVI and provided a platform for the following actions:

- a) to improve communication and collaboration between NRAs and NIP;
- b) to increase the sensitivity of the ESAVI surveillance system;
- c) to optimize the notification and investigation of ESAVI, given the use of some tools such as case definitions, exchange of information through PAHO's conference calls etc and;
- d) to develop an ESAVI software system (named E-SAVI) a new web-based application developed by PAHO, which facilitates the integration of vaccine safety surveillance into general ESAVI monitoring, supply management, and quality control.

Finally, we continue providing technical support upon request of the countries for crisis management and prevention, and therefore, we encourage the countries to prepare and/ or update your annual crisis prevention plan. We have also been actively involved with the Global Post Marketing Surveillance Network, a WHO initiative aimed at establishing standardized and reliable post marketing surveillance that are newly licensed, prequalified and introduced (or expanded) into routine immunization programs. PAHO has been providing technical guidance to the affiliated countries (Brazil and Mexico) and tracking progress in the implementation of their plan of actions for 2010.

## **2. Summary of Events Supposedly Attributed to Vaccines and Immunization (ESAVI) Workshop in St. Lucia**

The workshop on Events Supposedly Attributed to Vaccines and Immunization (ESAVI) was held at the Bay Garden's Hotel in St. Lucia on September 13-17, 2010.

Objectives of workshop were to:

- ⊙ Strengthen AEFI management and monitoring.
- ⊙ Ensure consistent case investigation and causality assessment practices.
- ⊙ Analyze data and report on the results.
- ⊙ Use the data for improving vaccine safety.
- ⊙ Communicate effectively about vaccine safety.
- ⊙ Further develop national capacity for AEFI training.
- ⊙ Ensure effective functioning of national advisory bodies on immunization concerning vaccine safety.

Various teaching methodologies were employed during the workshop which included lecture discussions and group work. At the end of the workshop EPI Managers and National Regulatory Authority staff had their knowledge on causality assessment and ESAVI management & monitoring strengthened.

It was determined that countries already had surveillance mechanisms in place but needed to be committed to strengthen ESAVI monitoring. Guidelines on vaccine risk communication were provided to develop an ESAVI crisis plan.

Areas for improvement identified, included reporting, investigating and giving feedback on ESAVI, capacity building on vaccine safety, development of ESAVI plan of action and the importance of establishing ESAVI Committees in country. ESAVI plan would be included in EPI Plan of action for 2011. ESAVI chapters in immunization manuals and ESAVI reporting forms would be updated.

Finally all efforts on vaccine safety issues should be oriented to reduced programmatic errors and maintain the public trust in the immunization program.

## **3. Country report from the Bahamas**

### **RECOMMENDATIONS – ESAVI SURVEILLANCE:**

- Countries are requested to review and amend their ESAVI surveillance system, in accordance with what was agreed at the St. Lucia Workshop. However, a practical approach should be applied when the review is being done.

- Countries need to use every opportunity to remind the public of the value of vaccinations and what has achieved through vaccination.
- PAHO was requested to look at the possibility of making available some generic information and basic facts on vaccine preventable diseases, which can be displayed in the clinics. A “Vaccination DVD” for the waiting room at clinics would also be helpful.
- For all Events Supposedly Attributable to Vaccination or Immunization (ESAVI) reported, clear and careful investigation and documentation is critical. Countries are encouraged to conduct an efficient and rigorous investigation, fulfilling all the necessary steps that will enable the countries to compile strong evidence for final ESAVI classification (causality assessment).
- Countries should integrate vaccine safety activities into their EPI Plans of Action for 2011, which should be sent to PAHO Headquarters to improve technical cooperation in the coming year. The following areas of work related to safety issues were identified during the causality assessment workshop that convened EPI managers from 19 Caribbean countries in St. Lucia:
  - a. Strengthen local capacity on vaccine safety, focusing training on ESAVI management and monitoring, vaccines and common adverse reactions, and revision and update of ESAVI chapters in immunization manuals.
  - b. Strengthen periodic reporting of ESAVI and investigation, focusing activities on the revision and/or update of reporting forms, the development of checklists and/or algorithms for reporting, the revision and/or update of case definitions, and the establishment of a strong and regular ESAVI reporting system within countries and with other institutions (CAREC, PAHO, etc).
  - c. Involve key stakeholders, including the public sector and NGOs, in reporting and investigation activities.
  - d. Set up social communication and mobilization activities to improve communication with the media and establish strategic alliances with trusted sources (i.e. scientific societies, church, among others).
- Countries should establish an Advisory Committee on ESAVI to provide appropriate advice on causality assessment issues. Countries may use existing immunization technical committees, advisory bodies, pediatric associations, or other entities to serve the purpose of this independent review body.
- CAREC in conjunction with the countries should review the current ESAVI monitoring system to: modify the weekly reporting form to include reporting of ESAVI; simplify the causal assessment form/guidelines that countries should use to classify cases; develop or identify a database to store ESAVI information received from countries;<sup>9</sup> and assist countries to amend the guidelines to incorporate the information obtained during the workshop.
- Countries should develop laminated informational sheets that address the benefits of vaccination, the potential adverse events that may occur, and what to do in the case of an adverse event. These sheets should be available in all health facilities and used to educate families.

## **XI. OTHER TOPICS:**

### **Summary of Aruba and N.A. Managers Meeting**

The fifth meeting was held in Willemstad, Curacao on 5-6 August 2010. The participants were the EPI Managers of Aruba, Bonaire, Curacao, Saba, St. Eustatius and St. Maarten. Staff members involved in the EPI programs on the different islands participated as observers.

The objectives of the interisland meeting were: 1) exchange ideas and experiences; 2) consolidate the prevention of infectious diseases; 3) discuss strategies for elimination; and 4) elaborate on developments in the area of vaccination.

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<sup>9</sup> PAHO is currently developing a web-based platform for ESAVI notification, investigation and reporting, which could be used by countries to compile and analyze immunization safety data.

This year an important point on the agenda was the constitutional changes in the Netherlands Antilles and the fact that on the 10 October the Netherlands Antilles would cease to exist. The islands reported on the results of their EPI programs. The general conclusions were that:

- The immunization programs are visible and can rely on motivated health workers.
- Overall high routine coverage for all antigens in the basic schedule.
- Successful school based vaccination programs.
- Commitment to update schedule for MMR1 and 2.
- Concerns about impact of constitutional changes on programs.
- Strong desire to strengthen inter-island collaboration and regional collaboration with PAHO and CAREC.

Recommendations were made to ensure the sustainability of the programs and protect achievements and gains on the islands of the former Netherlands Antilles and Aruba. Special attention was given to the desire to maintain the inter-island cooperation in the area of syndromic surveillance, as well as EPI and youth health. A strong recommendation was made to PAHO/CAREC to provide technical assistance to the six islands for a period of 3-6 months to ensure that the process of documentation and verification of measles, rubella, and CRS elimination would successfully be implemented. A final commitment was stated that the changes in constitutional status would not have a negative influence on the inter-island and regional collaboration.

#### **Recommendations – Summary of Aruba and N.A. Managers' Meeting:**

- Technical assistance was requested for 3 – 6 months to support the verification and documentation of the elimination of Measles, Rubella and CRS.
- In their new status the five (5) countries (Bonaire, Curacao, Saba, St. Eustatius, St. Maarten) of the dismantled Netherlands Antilles would like to continue to be a part of PAHO and CAREC. Aruba will continue.

### **Operational Aspect of the PAHO Revolving Fund**

The Revolving Fund (RF) continues to be pressured by other institutions and the manufacturing industry to change its principles of single price and lowest available price. Such changes means that the principles of solidarity, equity, and access to quality vaccines would be affected and immunization programmes in the Caribbean would be seriously compromised resulting in unfortunate consequences for public health.

The EPI Managers recognized the important role of the RF in the immunization programmes as the RF has been used by countries of the Caribbean Community to acquire affordable and quality vaccines.

#### **RECOMMENDATIONS – OPERATIONAL ASPECTS OF THE PAHO RF:**

- Countries should continue to advocate for the sustainability of the Revolving Fund to provide an uninterrupted supply of affordable and quality vaccines to the countries of the Caribbean and territories in the Region.

### **Surveillance and Immunization Awards**

An annual **Caribbean Surveillance Award** has been established to recognize countries that have performed outstandingly on the surveillance component of their program during the previous year. The award is based on two main criteria: on-time reporting and the percentage of sites reporting to CAREC. The award consists of a certificate and the inscription of the name of the country on a plaque that is kept by the winning country during the following year and until a new country is selected to receive the award. The award is announced during the annual Managers' meeting. **Montserrat** is the recipient of the 2010 Surveillance Award. Awards for the second and third places went to **Belize** and **Suriname**, respectively.

**The Henry C. Smith Immunization Award** is presented this year to Bahamas. The award is in honour of Mr. Henry C. Smith, who was the first PAHO-EPI technical officer for the Caribbean subregion. His service in the subregion spanned 18 years. The immunization trophy is awarded to the country that has made the most improvement in EPI.

Participants at the 27th Caribbean EPI Managers' Meeting sincerely congratulate these countries for being the recipients of awards and extend their compliments to all their health workers for such outstanding performances.

**The 28<sup>th</sup> Caribbean EPI Managers' meeting will be held in November 2011.**

## Progress of Measles, Rubella, and CRS Elimination

### 1. Status of Measles, Rubella, and CRS Surveillance in the Americas

In 1994, countries of the Region of the Americas set a goal of interrupting endemic measles transmission by the end of 2000 through the adoption of Resolution CSP24.R16 during the XXIV Pan American Sanitary Conference. As a result of the countries of the Americas joining forces to attain the regional goal, the implementation of the effective elimination strategies led to the rapid decrease of cases, achieving the interruption of endemic transmission in 2002. It has been estimated that the implementation of this initiative for the period 2000-2020 will have prevented 3.2 million cases of measles and 16,000 deaths, saving over US \$208 million in treatment costs due to reduced incidence of measles (Figure 1).

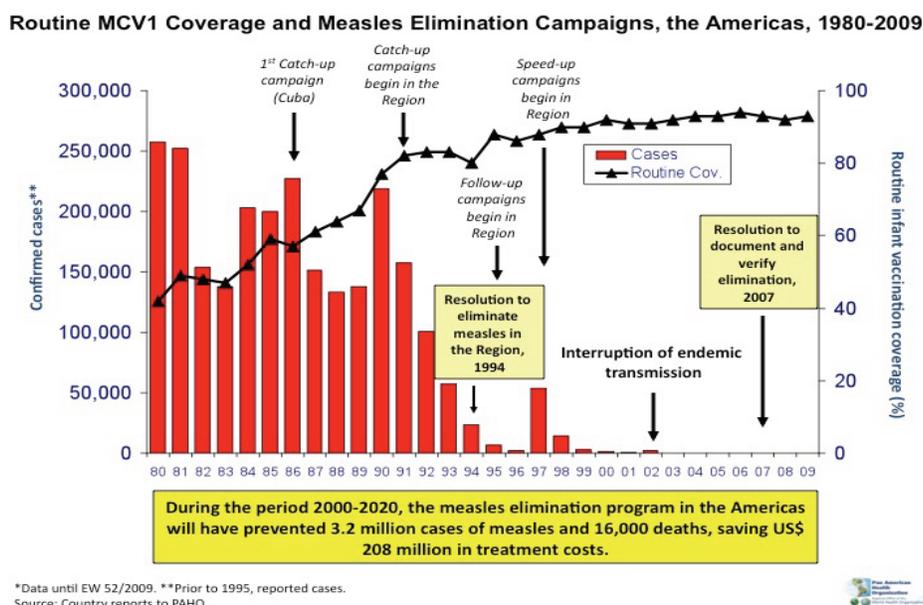


Figure 1

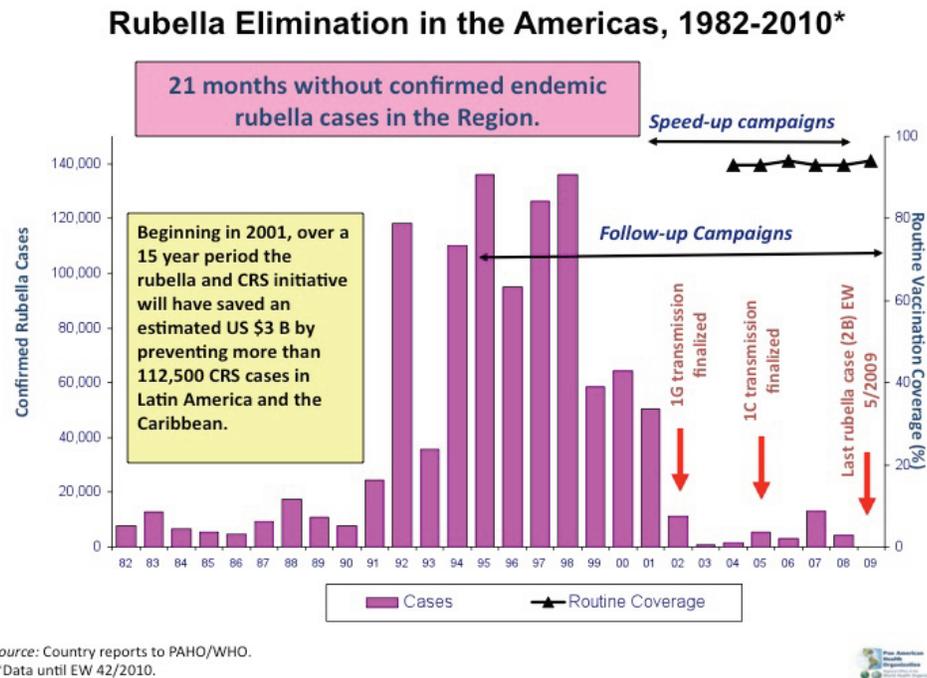
The enhanced measles surveillance system, developed to support the regional goal of measles elimination, highlighted the significant widespread circulation of endemic rubella virus in many countries. In response, PAHO developed a rubella/CRS control strategy, which continued to evolve to one of rubella elimination that was supported and sustained through several PAHO resolutions. Rubella vaccination strategies were aligned with those of measles strategies through the use of the combined measles-rubella (MR) vaccine. The integration of strategies contributes to maintaining and achieving the elimination of both diseases and has resulted in many synergies to improve case investigation and classification.

During the post-elimination era, measles cases have been reported in historically low numbers in the Americas: 119 in 2003, 108 in 2004, 85 in 2005, 237 in 2006, 176 in 2007, 207 in 2008, 89 in 2009, and 228 in 2010.<sup>10</sup> The highest incidence rate during this period was 0.26 per million people due to outbreaks in

<sup>10</sup> Data reported until epidemiological week 45/2010.

2006. A main contributor to sustaining this success was the implementation of speed-up campaigns, an integral component of the rubella elimination initiative. The commitment of the countries to vaccinate adolescent and adult populations with the combined MR vaccine not only accelerated the interruption of endemic rubella virus transmission but also prevented the reestablishment of endemic measles transmission in the Region.

The Region of the Americas has successfully interrupted rubella virus transmission. The last instance of 1G transmission was in 2002, 1C transmission was finalized in 2005, and the last endemic rubella case, identified as genotype 2B, was reported in Argentina in epidemiological week 5/2009. It has been estimated that over a 15-year period the rubella and CRS elimination strategy will have saved an estimated \$3 billion dollars by preventing over 112,000 CRS cases in Latin America and the Caribbean (**Figure 2**).



**Figure 2**

In many ways rubella elimination has served as a catalyst for maintaining measles elimination: speed-up campaigns reached susceptible adolescent and adult populations with the combined MR vaccine; countries were prompted to introduce the combined MR vaccine into their routine program; measles/rubella surveillance was integrated; increasing emphasis was given to the role of molecular epidemiology; political commitment was sustained and health workers were enthusiastic about the program; alliances were built with scientific societies and new relationships were fostered; and finally the elimination initiative provided another opportunity to document the experience of the Americas.

The integrated measles-rubella surveillance strategy encompasses weekly reporting of suspected cases, including negative reporting; laboratory confirmation of suspected cases using serology; active case searches in areas reporting cases and in silent municipalities; measles and rubella virus genotyping; and classification of confirmed cases by source of infection as imported, import-related, or unknown. In order to ensure high-quality surveillance, additional strategies are implemented including the continuous monitoring of surveillance indicators; periodic feedback of data; laboratory accreditation; improvements in molecular epidemiology; increased collaboration between multidisciplinary groups; adequate outbreak investigation; improved coordination with the private sector; additional trainings to expand national capacity; and the periodic implementation of EPI evaluations.

Outbreaks are just one of the many challenges confronted during the post-elimination era and are reminders that until measles and rubella eradication are achieved, countries in the Americas are at risk of importations. In 2010 measles cases have mainly been reported from a handful of countries and are



- Countries should routinely maintain high, homogenous coverage (>95%) by municipality through the administration of the 1st and 2<sup>nd</sup> MMR routine dose, monitor the accumulation of susceptibles, and continue the implementation of high quality mop-up activities.
- Countries should achieve an adequate level of preparedness by developing national plans for preparation and rapid response to an importation and potential outbreaks.
- Countries should continue strengthening collaboration with the private sector in measles, rubella, and CRS surveillance to support the rapid detection of importations and response to outbreaks and to strengthen immunization activities.
- Countries should ensure the completion and continuous monitoring of the recommended standardized measles/rubella surveillance indicators to attain high-quality surveillance, emphasizing high-risk and “silent” areas.
- Countries should continue to implement measures to increase sensitivity and quality of the CRS surveillance system to document suspected CRS cases.
- Countries should continue to sensitize health workers as to the signs and symptoms of measles, rubella, and CRS to ensure the timely reporting of suspected cases.
- Measles, rubella, and CRS cases should be classified after the laboratory and epidemiologic teams have reviewed all laboratory results and epidemiologic data.
- Social communication materials should be developed (e.g. posters) to highlight the following topics: the Region of the Americas has eliminated measles and rubella; importations continue to pose a risk to the countries; the benefits of immunization programs.

## Documentation and Verification of Measles -French Departments

In accordance with Resolution CSP27.R2, the Regional Health Agencies (Agences régionales de santé/ARS) of the three French departments in the Americas (DFAs per the French acronym) are quickly advancing in the documentation and verification process. The Commission for the Documentation and Verification of Measles, Rubella, and CRS Elimination in the DFAs was officially established on 24 September 2010 and nominated Dr. Philippe Quénel, Scientific Coordinator, Cire Antilles Guyane (InVS), as president. The Commission is comprised of a multidisciplinary team, whose members are epidemiologists, virologists, pediatricians, and immunization professionals. The commission's geographical scope of work will be French Guiana, Guadeloupe, Martinique, and the two French overseas territories of St. Barthelemy and St. Martin.

The first meeting of the commission took place from 21-22 October 2010 in Fort-de-France, Martinique. The objectives were the following: to present the members of the Commission for the Documentation and Verification of Measles, Rubella, and CRS Elimination in the DFAs; to review and discuss the Regional Plan of Action for Documentation and Verification of Measles, Rubella, and CRS elimination; to define the activities required, including instruments for the elimination criteria.

Several points regarding the immunization program and measles, rubella, and CRS surveillance were highlighted in the context of the documentation process. France does not have an immunization program similar to the Expanded Program on Immunization (with the exception of French Guiana), with a single manager responsible for all vaccination activities. The national vaccination policy is set by the Ministry of Health and implemented by different entities in the field: maternal and child health services, private physicians, school nurses. In addition, most vaccination activities are conducted on a routine basis and not through the implementation of vaccination campaigns. In addition, MMR vaccine was introduced in 1989 in France, but is not a mandatory vaccine. Vaccination with MMR is conducted on a voluntary basis and is administered at 12 months of age for the first dose (or earlier at 9 months of age if the child attends daycare), while the second dose is administered between 12-24 months.

In each French department, the Regional Health Agency is the main entity responsible for surveillance; however, surveillance mechanisms differ slightly between measles and rubella. Measles is a mandatory disease for notification, while rubella is notified on a voluntary basis. All suspected measles cases are reported directly to the ARS mainly by private physicians who are in charge of routine immunization in the DFAs. Upon notification, a mandatory reporting form is filled out and case investigation is conducted. Control measures are also implemented, such as active search of contact cases. Samples are collected for laboratory confirmation, but samples for viral detection/isolation are not usually obtained. For rubella, the ARS requests all physicians to report any rubella infection in pregnant women and newborns twice a year.

The second mechanism for measles and rubella surveillance is through the laboratory (Institute Pasteur de Guyane/IPG). This type of surveillance, however, only exists in French Guiana, and is used in addition to the notification system. Any sample that fulfills the case definition is tested at the IPG for measles and rubella (serology). Positive results for any of these diseases are immediately notified to the ARS, which prompts a thorough case investigation.

Third, ARSs have implemented a web-based system for receiving and processing any health notification, including measles but not rubella. The platform (*Voozalerte*) is a tool for ARS use only, with the purpose of standardizing reception and processing of all health notifications reaching the ARS. The tool provides tracking capability for each action taken to process the notification.

Two confirmed measles cases were reported in French Guiana in April 2010, the first ones since 2000. Both cases were classified as import-related: one a 25-year old female, unvaccinated, precedent from Paris and the other a 13-month old baby, with no vaccination history. Samples for viral detection/isolation were not collected. After measles control measures were implemented, 160 persons were identified as contacts and 93 persons received a booster with measles-containing vaccine.

Guadeloupe also notified four measles cases in 2005, 2006, 2007 and 2009; the 2005, 2007, and 2009 cases were only clinically confirmed; the 2007 case was laboratory confirmed. Martinique has not reported any measles cases since 2005.

During the first meeting in October 2010, the commission reviewed each component of the regional plan of action to determine how data could be collected and analyzed according to the realities of the DFAs.

#### 1. Epidemiology of Measles, Rubella, and CRS:

- Analyze the correlation between PAHO and French case definitions.
- Define a “starting point” adapted to the epidemiological situation in the DFAs (2002 for measles and all data for rubella).
- Describe the surveillance systems in the DFAs.
- Review PAHO-recommended indicators: some will be available (morbidity rate, demographic characteristics of cases, CRS specificities) but others do not apply (seasonality, outbreaks).
- Identify limitations in molecular epidemiology (non-active to date).

#### 2. Quality of Surveillance:

- Identify difficulties of meeting recommended reporting rate ( $\geq 2$  per 100,000 pop.); if applicable, DFAs must justify a rate  $< 2/100,000$ .
- Conduct retrospective evaluations of investigations; incorporate data from *Voozalerte* Network.
- Study practical implementation of laboratory confirmation and viral detection.
- Implement retrospective search of CRS cases (use of birth defect registry, commissions for prenatal diagnostic (CPDPs), birth registry, registry of surgery for congenital cataract, hearing screening in kindergarten).
- Increase awareness among medical and laboratory staff regarding reporting (field investigation and control measures) and notification (improved epidemiological surveillance).

#### 3. Molecular Epidemiology and Laboratory Activities

- Organize logistics regarding the distribution and flow of kits to improve laboratory activities.
- Conduct systematic molecular epidemiology at least for outbreaks; follow-up on case investigation to determine whether a second sample is required (measles); and monitor virus excretion from confirmed CRS cases.

#### 4. Vaccination

- Reviewed health certificate of the 24<sup>th</sup> month (from 2004 to 2010), registries of health visits by maternal and child health services and school physicians at ages 3, 6, and 15 years, registries of wholesale vaccine providers.
- Document the results of vaccination coverage surveys conducted in all DFAs since the beginning of the 1990s.
- Review all current or future serotypes in the DFAs, as well as conduct a study regarding how pertinent their use would be to assess immunity in adults.
- Conduct school surveys every three years in each DFA and adapt vaccination coverage studies to local epidemiology and to the new vaccination schedule.

#### 5. Sustainability of the National Immunization Policy

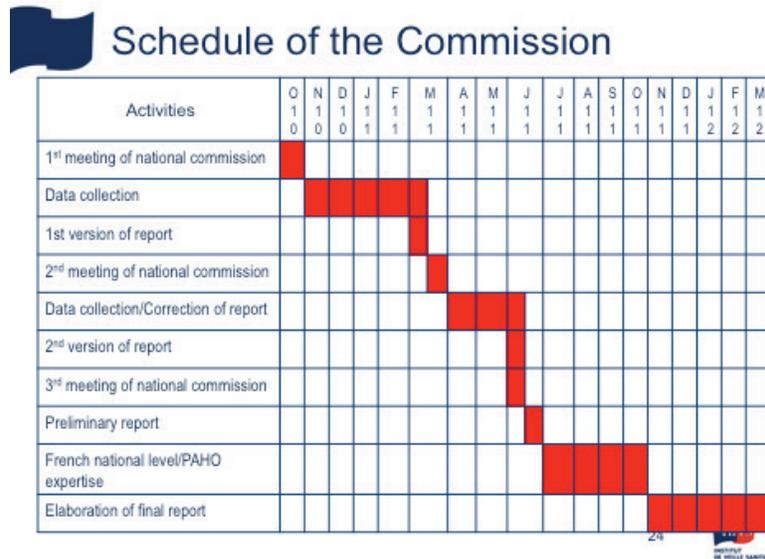
- Provide an overview of the vaccination program in each DFA and evaluate the vaccination policy (Martinique 2006, Guiana 2011).
- Gather all information regarding the sustainability of the immunization policy in the DFAs: from health insurance, maternal and child health program, and others.
- Include information regarding the French plan for a sociological study to examine the anti-vaccine movement, while stressing that opposition is not as strong in DFAs as it is in the mainland or Europe in general.

#### 6. Integration of the Evidence

- Review the draft report presented by Brazil and the polio reports from the 1990s.

- Involve authorities at the ministerial level (Ministry and InVS) to interpret the data collected in order to evaluate the elimination status and develop recommendations.
- Prepare a draft of the final report to be submitted to the Ministry of Health prior to sharing the report with PAHO.

Below is the timeline established by the Commission for the Documentation and Verification of Measles, Rubella, and CRS Elimination in the French departments in the Region of the Americas for completing the documentation and verification process. **See Figure 1.**



**Figure 1**

## Vaccination progress against influenza A H1N1

Countries and Territories	Doses Administered	Target Population Coverage	Total Population Coverage	Prioritized Risk Groups			
				Health Personnel and Essential Services	Pregnant Women	Chronic Diseases	Others
Anguilla	-	-	-	-	-	-	-
Argentina	7,679,327	118.6%	19.3%	104.7%	101.4%	132.5%	116.2%
Bahamas	5,006	18.3%	1.5%	18.0%	18.6%	15.8%	-
Barbados	4,360	21.8%	1.7%	64.2%	3.3%	11.5%	-
Belize	416	1.1%	0.1%	-	-	-	-
Bermuda	1,053	22.7%	1.6%	-	-	-	-
Bolivia	1,097,280	84.4%	11.3%	67.1%	32.0%	69.2%	144.7%
Brazil	92,000,000	97.7%	47.9%	120.1%	77.1%	163.2%	81.8%
Canada	-	-	-	-	-	-	-
Cayman Islands	2,318	4.1%	4.8%	1.8%	5.6%	0.0%	5.0%
Chile	3,083,806	78.2%	18.4%	107.0%	54.4%	80.1%	77.3%
Colombia	1,964,515	101.8%	4.4%	53.4%	58.5%	101.3%	59.5%
Costa Rica	180,000	90.3%	4.0%	-	-	-	-
Cuba	1,123,526	100.1%	10.0%	101.8%	100.7%	98.8%	100.7%
Ecuador	973,480	97.8%	7.2%	101.7%	80.8%	92.8%	104.4%
El Salvador	1,690,101	115.3%	27.6%	186.0%	44.7%	-	114.6%
Grenada	396	2.7%	0.4%	5.1%	0.4%	1.1%	-
Guatemala	221,295	18.6%	1.6%	59.6%	30.9%	10.7%	5.7%
Guyana	170,601	97.0%	22.4%	-	-	-	-
Honduras	1,046,182	65.7%	14.3%	91.3%	55.5%	117.9%	50.2%
Mexico	26,903,232	96.7%	24.8%	94.9%	71.7%	101.9%	82.2%
Montserrat	1,245	77.5%	24.9%	-	-	-	-
Nicaragua	251,759	29.6%	4.4%	91.3%	88.1%	37.5%	15.7%
Panama	254,286	84.7%	7.5%	50.1%	32.1%	374.8%	85.3%
Paraguay	1,087,661	90.6%	17.4%	85.5%	37.3%	77.1%	103.3%
Peru	1,509,051	47.0%	5.2%	42.5%	9.1%	24.5%	249.7%
Suriname	24,674	29.0%	4.8%	23.4%	4.5%	10.4%	-
Trinidad and Tobago	23,985	34.3%	1.8%	57.0%	0.7%	-	-
Turks and Caicos Islands	2,837	37.9%	12.9%	25.9%	6.3%	12.7%	57.4%
United States	61,000,000	27.9%	19.6%	22.3%	38.1%	11.6%	13.9%
Uruguay	515,158	51.5%	15.4%	-	-	-	-
<b>TOTAL</b>	<b>202,817,550</b>						

Source: Report of countries. \* Population data: PAHO, Immunization in the Americas. Summary 2009. Comprehensive Immunization of the Family. Area of \*\*Family and Community Health'. ( - ) Unavailable data. Coverage more than 100% can be attributed to imprecise estimations of the denominators