Pan American Health Organization
Regional Office of the World Health Organization

Immunization Unit
Family and Community Health Area

TWENTY-THIRD CARIBBEAN EPI MANAGERS' MEETING

FINAL REPORT

SURINAME
13-17 NOVEMBER 2006

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ACRONYMS

AFP	Acute flaccid paralysis
ARI	Acute respiratory infection
BCG	Bacille Calmette-Guérin
BMI	Body mass index
CAREC	Caribbean Epidemiology Centre
CARICOM	Caribbean Community
CPC	Caribbean Program Coordination
CPHA	Canadian Public Health Association
CRS	Congenital rubella syndrome
CSF	Cerebrospinal fluid
CWC	Cricket World Cup
DPT	Diphtheria-pertussis-tetanus vaccine
DPT3	Third dose of diphtheria-pertussis-tetanus vaccine
dT	Reduced diphtheria-tetanus vaccine
EPI	Expanded Program on Immunization
ESAVI	Event Supposedly Attributable to Vaccine or Immunization
EVSM	Effective Vaccine Store Management
EW	Epidemiological Week
GBS	Guillain-Barré Syndrome
GE	Gastroenteritis
GIS	Geographical information system
GIVS	Global Immunization Vision and Strategy
Hep B	Hepatitis B
Hib	*Haemophilus influenzae* type b
HHV	Human herpes virus
HPV	Human papillomavirus
IBIS	Invasive bacterial infection surveillance
ICC	International Cricket Council
IPV	Inactivated polio vaccine
ISIS	Integrated Surveillance Information System for Vaccine-preventable Diseases
MDG	Millennium Development Goals
MESS	Measles Elimination Surveillance System
MMR	Measles-mumps-rubella vaccine
MR	Measles-rubella vaccine
MOH	Ministry of Health
NGO	Non-governmental Organization
NIPPP	National Influenza Pandemic Preparedness Plan
OPV	Oral polio vaccine
PAHO	Pan American Health Organization
PESS	Poliomyelitis Surveillance Elimination System
RV	Rotavirus
TAG	Technical Advisory Group on Vaccine-preventable Diseases
TORCH	Toxoplasma gondii; other viruses (HIV, measles, and more); rubella (German measles); cytomegalovirus; and herpes simplex
UNICEF	United Nations Children's Fund
WCBA	Woman of childbearing age
VWA	Vaccination Week in the Americas
WHO	World Health Organization

I. Introduction

The 23rd annual meeting of the Caribbean EPI Managers was convened in the Republic of Suriname, South America, from 13-17 November 2006. During the opening ceremony, chaired by Dr. Wim Bakker of the Ministry of Health, Suriname, welcome greetings were given by Dr. Stephen Simon, PAHO/WHO Country Representative, and Dr. Leslie Resida, Director, Bureau of Public Health, Ministry of Health, Suriname. Representatives of collaborating agencies, including UNICEF, the Canadian Public Health Association (CPHA), the PAHO Office of Caribbean Program Coordination (CPC), and the Caribbean Community (CARICOM) also offered welcome greetings and extended their wishes for a successful meeting. Dr. Jon Andrus, Lead Technical Advisor, Immunization Unit, at PAHO's Headquarters, brought greetings from PAHO Director, Dr. Mirta Roses, and noted her abiding commitment and sterling support for immunization as a public health intervention. Ms. Beverley Reynolds, CARICOM Health Desk, emphasized that, although we are beneficiaries of innovations in communication, new technologies, and increased funding for health, we are also facing new health challenges, including threats of bioterrorism, that may erode our pace of progress. In order to continue to move forward on the immunization agenda and achieve the MDGs, it will be necessary to deepen political commitment, effectively integrate health services, and widen the playing field and cooperation between interested partners.

In his opening address, the Minister of Health of Suriname, Dr. Celsius Waterberg, acknowledged the importance of political commitment to the success of the immunization program in Suriname and the subregion. He also highlighted costs of new vaccines, vaccine availability, and reaching underserved populations as some of the new challenges being faced by immunization programs. He emphasized that there was need for continued commitment to immunization from the coalition of partners. The Minister underscored the fact that immunization programs do not just benefit the present generation, but also future generations.

In the inaugural session of the meeting, Dr. Andrus gave a brief overview of the history of vaccination in the Region and described the strategy for sustaining national immunization programs in the Americas. He noted that, in spite of the challenges encountered during the decade of the 1990s, such as the health sector reform, shifting donor attention, little interest in adding new vaccines, and the debate about immunization programs as vertical entities, significant progress was made in the area of immunization as evidenced by the eradication of poliomyelitis, the elimination of indigenous measles, and the significant reductions in the burden of neonatal tetanus, diphtheria, and pertussis.

As countries attempt to introduce new vaccine technologies, while simultaneously enhancing current programs and protecting the gains already achieved, a strategic vision must include the following:

- Implementing strategies to achieve 95% coverage in every district;
- Sustaining Vaccination Week in the Americas;
- Eliminating rubella and CRS by 2010;
- Achieving a broader protection against vaccine-preventable diseases by transitioning from child to family immunization;
- Supporting and promoting disease reduction targets as established by the MDGs and GIVS through new vaccine introduction;
- Implementing plans for strengthening national capacity for evidence-based decision;
- Expanding legislative and fiscal mechanisms for sustaining immunization programs; and
- Promoting expanded participation in the Revolving Fund.

Dr. Andrus thanked the Ministry of Health, Suriname, as well as the staff of the PAHO/WHO Country Representation for their support with the organization and execution of the meeting.

The 23rd meeting was attended by over 80 health officials from 23 countries of the English-speaking Caribbean, Suriname, Aruba, the Netherlands Antilles, and Canada. Other participants included representatives from the Caribbean Epidemiology Centre (CAREC), CPHA, and CARICOM.

II. Objectives of the Meeting

The overall objectives of the meeting were defined as follows:

- To review the progress made at subregional and national levels regarding national immunization programs since the last meeting in November 2005;
- To articulate the challenges encountered in the implementation of national plans and programs;
- To highlight the lessons learned and the new knowledge gained as work plans were conducted;
- To review and refine national work plans; and
- To discuss next steps and future plans.

In more specific terms, the objectives were defined as follows:

1. Analyzing the status of measles elimination in the subregion;
2. Evaluating the status of rubella/CRS elimination in the subregion;
3. Reviewing the status of national polio eradication efforts in each country;
4. Analyzing the status of each national EPI program;
5. Establishing immunization coverage objectives and targets as well as morbidity and mortality reduction targets for the EPI diseases in 2007;
6. Providing an update on selected topics of common interest in relation to immunization, service delivery, and surveillance of measles-rubella and other EPI diseases;
7. Discussing the introduction of new vaccines such as rotavirus, influenza, and HPV into the EPI in the subregion;
8. Discussing the status of rotavirus surveillance in selected countries;
9. Developing plans for the 2007 Vaccination Week in the Americas;
10. Discussing the challenges encountered in mobilizing immunization budget resources and;
11. Sharing and reviewing plans for enhanced EPI preparedness and surveillance in support of World Cup Cricket activities.

By the end of the meeting, each country was expected to have its 2007 Plan of Action with a tentative budget.

III. Immunization and Vaccine-preventable Diseases

1. Overview of the EPI in the Caribbean - 2006

The immunization program implemented in the countries since the 1970s has resulted in the successful elimination and control of many vaccine-preventable diseases such as poliomyelitis, diphtheria, measles, rubella, and neonatal tetanus. The continued commitment of Regional governments, health practitioners, and the population has greatly contributed to these successes. Timely and effective surveillance coupled with appropriate intervention responses have ensured that these successes are maintained.

The Immunization Program

The countries have continued to increase the types of vaccines administered in the public sector. The health care system of all countries is defining and redefining roles and functions, responsibilities and policies. Although the resulting structures may differ between countries, the main objective remains the same, that is, to provide excellent quality health care for the population over the entire life course. The immunization program should also provide vaccination services in a similar manner, targeting the family – infant, child, adolescent, adult (including special groups), and the elderly.

Vaccination of over 90% of the target population is achieved mainly by the public health sector through a network of clinics in the countries, with help from the private sector through offices and medical complexes. In most countries, vaccination of 5-10% of the national birth cohort is undertaken by the private sector. The Ministry of Health (MOH), in almost all countries, has the role of auditing and monitoring the EPI (such as cold chain status) in the private health sector. Immunization data from the private sector is submitted to the MOH of most countries and these data are included in the calculation of the overall coverage.

Introduction of New and Underutilized Vaccines in the Infant Schedule

New efficacious vaccines are becoming more available, though not always at affordable prices. The EPI is committed to the introduction of new vaccines when and where appropriate. In the public sector of many countries, the following vaccines are administered: BCG, diphtheria, tetanus, pertussis (whole cell or acellular), poliomyelitis (live attenuated and/or inactivated), hepatitis B, *Haemophilus influenzae* type b (Hib), measles, mumps, rubella, and yellow fever.

Varicella vaccine is part of the public sector schedule in two countries, and pneumococcus vaccine in one country. Various vaccine combinations such as trivalent, tetravalent, and pentavalent formulations are being used.

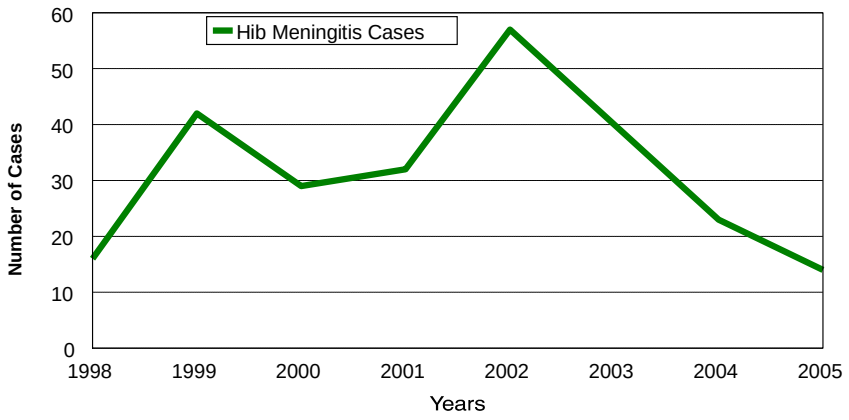
Haemophilus influenzae type b (Hib) and hepatitis B vaccines are part of the infant immunization schedule in the public sector in all countries. Sixteen countries are using the pentavalent combination vaccine (DPT-Hep B-Hib). In July 2005, Suriname introduced hepatitis B and Hib vaccines in the form of the pentavalent combination, and Dominica introduced it in September 2006.

The surveillance system for invasive bacterial infection (IBIS), which started in 1998 in five countries (Barbados, Guyana, Jamaica, St. Vincent & the Grenadines, and Trinidad & Tobago) continues. Presently all countries report cases of Hib, hepatitis B and pneumococcal infection to CAREC. Routine reporting in the present surveillance system provides information for monitoring the impact of the vaccination program.

Haemophilus influenzae Surveillance

Since the inception of IBIS in 1998, 253 cases of Hib meningitis were reported for the period from 1998 to 2005. The highest number of cases was reported in 2002 (Figure 1).

Figure 1. Reported *Haemophilus influenzae* Meningitis Cases, English-speaking Caribbean & Suriname, 1998-2005

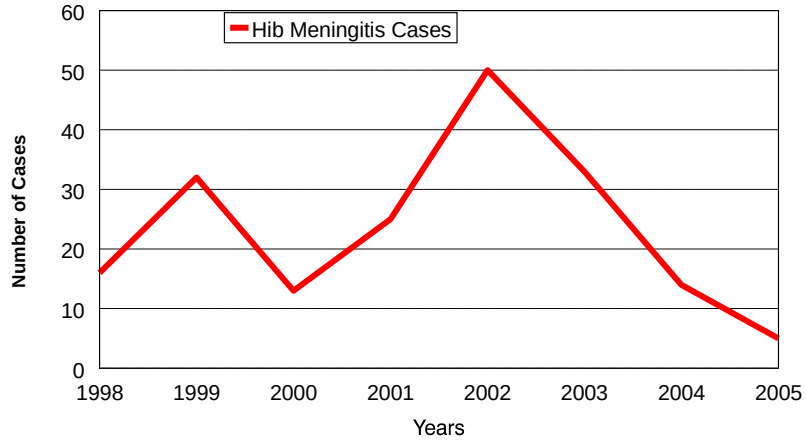


Source: MOH Reports to CAREC

Over 90% of countries have reported at least one case during that period and more than 95% of all cases were aged <5 years. At least three of these children died. A total of 84 Hib isolates were sent to CAREC for serotyping during 1998-2005. The most common serotype was type b (81 or 96% was type b); 3 were type a. The reported number of Hib meningitis cases has decreased since the vaccine has been introduced.

During the same period, Jamaica reported 179 cases, or 71% of the total meningitis cases. The highest number was reported in 2002 (Figure 2).

Figure 2. Reported *Haemophilus influenzae* Meningitis Cases, Jamaica, 1998-2005



Source: MOH Reports to CAREC

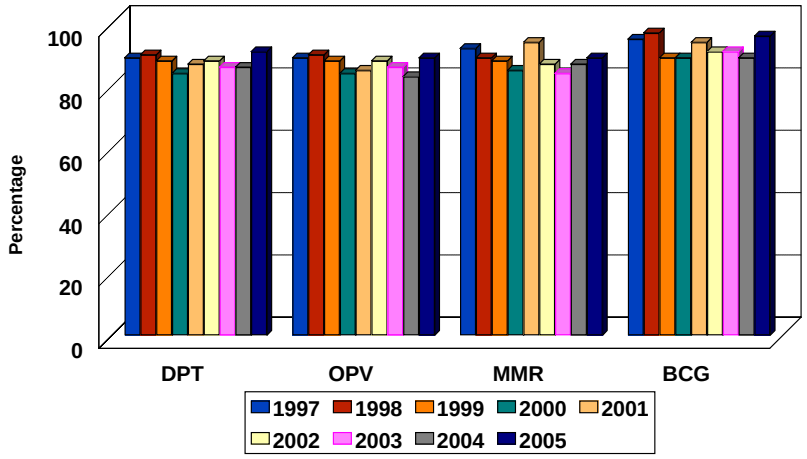
Vaccination Coverage

The overall vaccination goal for countries involves achieving equity when providing vaccination services with the following objectives:

1. Achieving 95% or more national coverage per biological product; and
2. Achieving 95% or more coverage at municipality level.

In 2005, the average coverage for 3rd doses for all 19 countries was DPT 91%, OPV 89%, Hib 86%, and Hep B 83%. For the 1st dose of MMR it was 89%, and BCG 96% (Figure 3).

Figure 3. Immunization Coverage (%) for Selected Antigens, CAREC Member Countries, 1997-2005



Source: MOH Reports to CAREC

The overall vaccination coverage for all antigens has increased compared with 2004. Ten (10) countries have sustained a vaccination >95%, while all countries had coverage >80% for all antigens.

Vaccination coverage of districts/regions within countries were reviewed for 2005. Guyana had 6 regions with coverage >95%. In Jamaica, none of the 14 parishes had MMR coverage >95%, and 5 parishes had coverage <80% (Annexes 1 and 2).

In 2005, a vaccination coverage survey was conducted in Jamaica. The study revealed that the national coverage for administered antigens was >95% for children aged 12-23 months. Children were being vaccinated, but later than the mandated schedule. A vaccination coverage survey is being conducted in Suriname. Similar studies will be proposed for Belize and Guyana.

Other Vaccine-preventable Diseases: For 2005, there were 13 cases of tetanus and 8 cases of pertussis-like syndrome reported, while in 2006 (as of Epidemiological Week 43) 1 case of pertussis-like syndrome and 5 cases of tetanus were reported. In addition, 12 cases of streptococcal pneumonia were reported, of which 10 were aged <5 years and 2 in the 5-9-year age group. No diphtheria case has been reported since 1994.

Vaccine and Logistics Procurement: In 2006, interruption of the supply of vaccines in countries has been minimal. All countries had an adequate supply of syringes and needles.

Surveillance - Immunization Safety: There was no report of serious events associated with vaccination in 2006. Updates and audits were conducted in countries for validation.

Immunization programs continue to make progress, although facing major challenges of increasing and sustaining high vaccination coverage. Effective management and supervision of the programs still remain major goals. The opportunity was taken to acknowledge the tireless efforts achieved by the committed and dedicated health practitioners to reach and protect all children.

2. Progress with Measles Elimination

It was noted that significant progress had been achieved with regard to measles elimination in the Region of the Americas, as a result of the application of PAHO's recommended strategies for *catch-up* and *follow-up* campaigns and *keep-up* through routine approaches. The last indigenous case of measles in the Americas was registered in Venezuela in 2002, while the last Caribbean case was recorded in 1991.

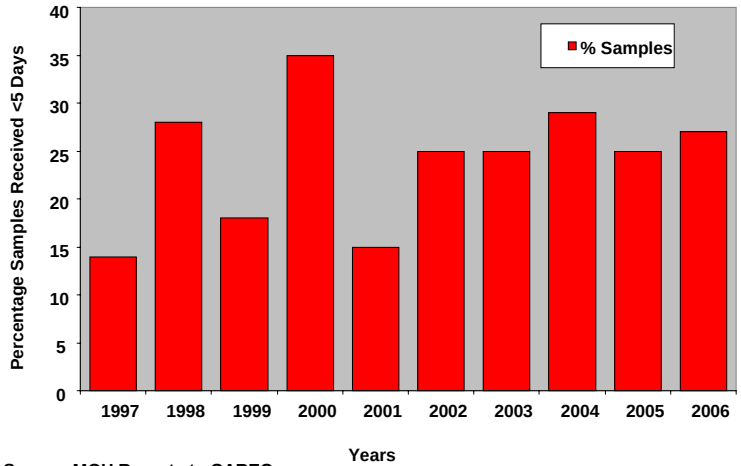
Thirty five countries have introduced a two-dose measles regimen in their immunization schedules. While this development was applauded, it was underscored that this strategy was not to be viewed as a replacement for *follow-up* campaigns, unless coverage rates ≥95% have been achieved for each dose.

Three of the four surveillance indicators have been met. However, the indicator for "Timely submission of samples to the laboratory" needs to be improved.

There were 699 reporting sites in the countries for 2006 (95% in the public sector), and 99% of all sites within countries reported weekly. In order to achieve timely, complete, regular, and accurate information from surveillance system, countries are encouraged to include private sector sites in their surveillance systems in addition to public sector sites. Almost all countries have private sector reporting sites.

The percentage of samples reaching the CAREC laboratory <5 days has remained <50% for the past years. In 2003, the rate was 23%; in 2004, it was 29%; for 2005, only 25% of specimens arrived at the regional laboratory <5 days. For 2006 (as of EW 43), the rate is 32% (Figure 4)

Figure 4. Percentage Samples Received in CAREC Laboratory <5 Days, English-Speaking Caribbean and Suriname, 1997-2006*



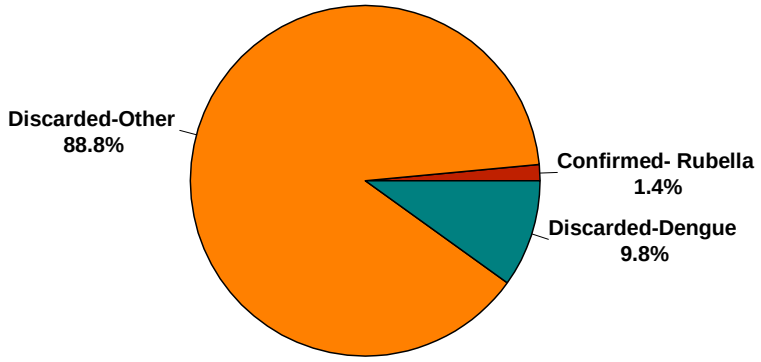
Source: MOH Reports to CAREC

* As of EW 43.

Laboratory testing was conducted in 99% of the 6,401 cases reported between 1991 and 2005.

Between the years 2000-2005, there were 1,920 suspect cases (fever and rash) reported. Of these cases, 27 were laboratory-confirmed as rubella, and 189 as dengue (Figure 5). There was no laboratory-confirmed measles case. The remaining cases (1,704) were neither measles, rubella nor dengue. Of the cases that were neither measles/rubella nor dengue, there were laboratory-confirmed cases of human herpes virus type 6 (HHV-6), and clinical diagnoses such as scarlet fever and allergic reactions to drugs.

Figure 5. Classification of Suspect Measles Cases, English-speaking Caribbean & Suriname, 2000-2005

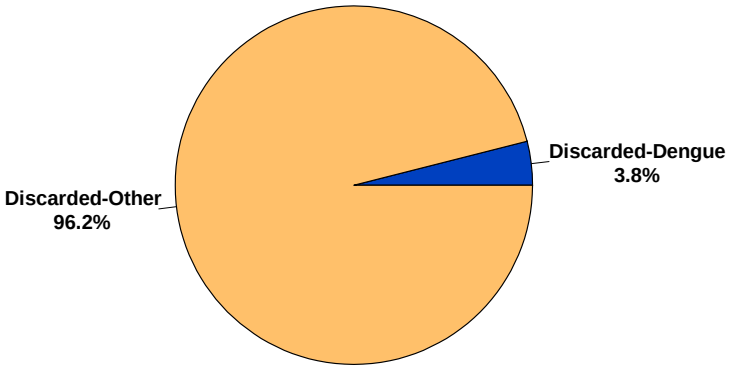


Source: MOH Reports to CAREC

About 99% of cases had laboratory testing done at CAREC. The last laboratory-confirmed measles case in the subregion occurred in 1998 in a tourist from Europe.

For 2006 (EW 43), 157 cases of fever and rash were reported. Six cases were laboratory-confirmed as dengue and 151 cases were discarded as neither measles, rubella, nor dengue (Figure 6). There was no laboratory-confirmed case of rubella or measles in 2006. Of the fever and rash cases reported, 69% were aged <5 years, 22% were aged 5-14 years, and 9% were aged ≥15 years.

Figure 6. Classification of Suspect Measles-Rubella Cases, English-speaking Caribbean & Suriname, 2006*



Source: MOH Reports to CAREC

* As of EW 43.

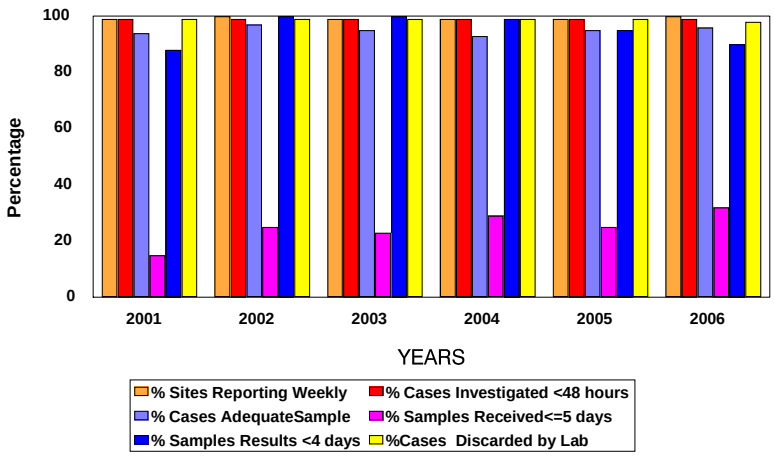
Of the 151 cases with test results that were neither measles or rubella, specimens from 62 cases aged <5 years were tested for human herpes virus type 6 (HHV-6/roseola), and 11 (17%) tested IgM positive for HHV-6. One case was positive for parvovirus.

In addition to the 157 cases reported by the CAREC member countries, French Guiana reported 70 fever/rash cases of which none were laboratory-confirmed as measles, dengue, or rubella.

Surveillance Indicators

In 2005, 99% of surveillance sites reported weekly and 99% of cases were investigated within 48 hours. Ninety-five percent (95%) of cases had adequate samples taken and 99% received laboratory results <4 days. Cases discarded by laboratory testing were 99%. Only 25% of samples arrived at the CAREC laboratory <5 days (Figure 7). In 2006 (EW 43), 99% of sites reported weekly, 99% of cases were investigated within 48 hours, 96% of cases had adequate samples taken, and 92% received laboratory results <4 days. Ninety-eight percent (98%) of specimens were discarded by laboratory testing.

Figure 7. Status of Measles Surveillance Indicators, English-speaking Caribbean & Suriname, 2001-2006*



Source: MOH Reports to CAREC

* As of EW 43.

While improvements were noted in the quality of samples and completeness of laboratory forms, a concern was raised by CAREC regarding the number of fever and rash cases being reported annually from member countries. It was concluded that countries of the Caribbean need to renew their commitment to increasing immunization coverage and enhancing their rash-fever surveillance for measles and rubella, as the data presented raised concerns about the quality, completeness, and timeliness of surveillance. This re-commitment to excellence in surveillance is essential to continue to be assured of evidence-based indigenous measles and rubella elimination in this subregion. There was an urgent call to EPI Managers to immediately initiate the required surveillance procedures when suspect cases of rash-fever illness are reported.

The need for improvement in the indicator related to time between specimen collection and their receipt at the laboratory in CAREC was repeatedly emphasized. During 2006, as for the Region of the Americas, only 32% of clinical specimens generated in the Caribbean subregion were received at the laboratory within the stipulated five-day period. Jamaica highlighted the challenges encountered in achieving this indicator and requested support from PAHO for

resources to re-establish a national laboratory diagnostic capacity for primary testing in support of EPI surveillance.

Measles in Canada

Before the introduction of vaccination, measles occurred in 2-3 year epidemic cycles with an estimated 300,000 to 400,000 cases. Since vaccine introduction, the incidence has declined markedly. Between 1989 and 1995, in spite of the very high coverage, there were many outbreaks involving mainly children who had received only one vaccine dose. An estimated 10 to 15% children remained unprotected after a single dose at 12 months of age, a proportion large enough to allow circulation of the measles virus. In 1996 and 1997, Canada adopted a routine two-dose schedule, and most regions conducted a catch-up program in school-aged children to protect those susceptible after the first dose. In recent years, 6 to 15 cases are reported annually, all imported or import-related. Canada continues to have no endemic measles transmission. Epidemiologic and virologic evidence supports that Canada has eliminated indigenous measles transmission.

It was noted that TAG had decided to postpone certification of measles elimination in the Americas until the world was closer to measles elimination. Countries were reminded that the absence of measles in a country, even with coverage of 95%, was meaningless since measles is still circulating globally, and a pool of susceptibles, however small, could fuel an epidemic if there were importations.

Recommendations:

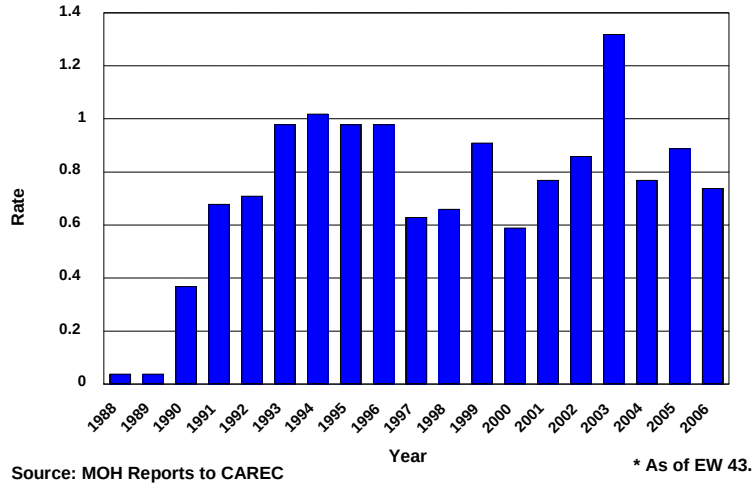
- PAHO should provide support to Jamaica for the re-establishment of the capacity at the National Public Health Laboratory for testing of fever and rash specimens.
- Countries should develop special strategies to facilitate a more rapid delivery of specimens from the periphery to the national central laboratories.
- Countries should keep abreast of new developments in the regional airline industry in order to preclude any negative impact of changes or mergers on the transportation of clinical specimens within the subregion.
- Countries should evaluate coverage of the 2nd MMR dose in the 1-6-year age group. If coverage is <95%, countries should implement mop-up activities.

3. Polio Eradication Efforts

Reports of AFP cases were submitted weekly from 493 surveillance sites within countries. Ninety-nine percent (99%) of the sites have reported weekly up to EW 43 in 2006. For the years 1994-2005, 224 AFP cases (aged <15 years) were reported from more than ten countries.

The annual AFP rate ranged from 1.0 in 1994 to 0.89 in 2005. The year 2003 had the highest rate with 1.32 per 100,000 population aged <15 years (Figure 8).

Figure 8. Annual AFP Case Rate per 100,000 <15 Years, English-speaking Caribbean & Suriname, 1988-2006*



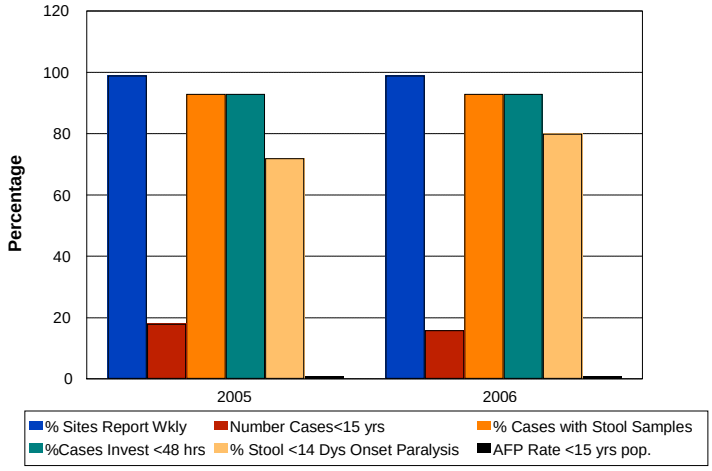
Source: MOH Reports to CAREC

* As of EW 43.

In 2005, 28 cases with ages ranging from 11 months to 61 years were reported from 7 countries (Bahamas, Belize, Guyana, Jamaica, St. Vincent & the Grenadines, Suriname, and Trinidad & Tobago). Stool samples were submitted for 26 (93%) of the cases. Eighteen of the 28 cases (64%) were aged <15 years. Ninety-three percent of the cases were investigated within 48 hours. Stool samples were submitted for 17 of the 18 cases aged <15 years. Bahamas, Belize, Guyana, and Suriname met all four surveillance criteria.

In 2006 (EW 43), 24 cases (age range: 18 months to 83 years) were reported from 4 countries. Sixteen (67%) of the cases were aged <15 years and were reported from Guyana, Jamaica, and Trinidad & Tobago. A total of 94% of cases were investigated within 48 hours. Stool samples were submitted for 15 cases (94%) aged <15 years. Eighty-seven percent of cases had specimens taken within 14 days of paralysis onset (Figure 9). Guyana and Jamaica met all four surveillance criteria; Trinidad & Tobago met two. The rate up to EW 43 was 0.79 per 100,000 population aged <15 years. For surveillance completeness, countries must report all AFP cases detected, regardless of age.

Figure 9. AFP Surveillance Indicators, English-speaking Caribbean & Suriname, 2005-2006*



Source: MOH Reports to CAREC

* As of EW 43.

Validation of Surveillance System: Validation of the AFP surveillance system, using hospital logs, was performed for the Bahamas in 2005. The findings of the review had good correlation with the reported surveillance information.

Recommendations:

- Countries should report all AFP cases detected, regardless of age.
- Countries should, with urgency, submit the outstanding reports on their polio containment activities in laboratories.

4. Rubella Elimination: Gaining Experience

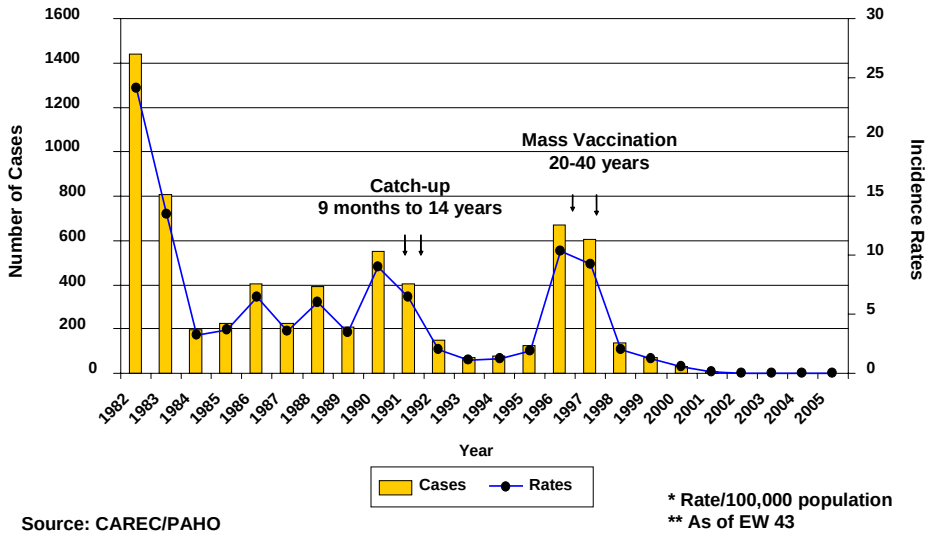
The 2003 PAHO Directing Council Resolution CD44.R1 calling for rubella and CRS elimination in the Region was re-affirmed during the 2006 Directing Council and a call was also made to move from child to family immunization. Since 1998, over 76 million people have been vaccinated through campaigns targeting persons aged <40 years with relatively high coverage in the Region. Of the countries of the Americas, only five remain to conduct rubella campaigns. It was noted that one campaign with high coverage was good enough for herd immunity.

In 2005, 1,952 suspect rubella cases were reported, 99% from 6 countries. In 2006, 518 suspect cases were reported, 95% from 4 countries. The most frequent genotypes found in the Americas were 1C, 1E and 1g. 1C is found only in the Americas.

For the Americas, the next steps include completing the campaigns, maintaining 95% coverage, continuing vaccination of men and women, and strengthening the measles and rubella surveillance indicators.

Since mass rubella vaccination activities were conducted in countries of the Caribbean from 1997 to 1999, 70 rubella cases were reported in 1999 (24 laboratory-confirmed cases in MESS), 21 cases in 2000, and 6 cases in 2001. There has been no confirmed rubella case from 2002 to 2006 (EW 43) (Figure 10).

Figure 10. Rubella Cases and Incidence Rates*, English-speaking Caribbean & Suriname, 1982-2006**



CRS surveillance started in 1996 and an algorithm was put in place to guide EPI managers. From 1997 to 2006, 193 suspect cases were reported from 10 countries, with 31 confirmations from 7 countries prior to 2000. In 2006, 1 suspect CRS case was referred for testing and 83 cases for viral studies in reference to toxoplasmosis, rubella, cytomegalovirus, and herpes (TORCH). All were laboratory-investigated for rubella and found to be negative. The last indigenous CRS case in CAREC member countries was reported in 1999 in Suriname.

Rubella in Canada

Canada introduced the rubella vaccine in 1969. Between 1970 and 1982, two main strategies were used for CRS prevention: routine "infant" and "selective" immunization of pre-pubertal girls. The latter policy resulted in a building up of susceptible cohorts of males. An MMR vaccination program for all infants at 12 months was introduced in 1983. A 2-dose MMR program was introduced in 1996-97. The goals for rubella vaccination have been set for 97% coverage for 1 dose of MMR at 12 months by 2010 and 97% coverage for 2 doses of MMR at 7 years by 2010. Testing for rubella is conducted by 38 laboratories throughout Canada and virus characterization is also performed.

National rubella notification began in 1924 and CRS notification in 1979. A large rubella outbreak, mainly among males, occurred as a result of selective immunization policies in 1996-1997. Record low levels were reached in the early 2000s. However, an outbreak confined to a religious community which opposes immunization occurred in February to July 2005, involving primarily school-aged children. There were a total of 309 cases, 65% aged 5-15 years. The genotype isolated was 1g, similar to the strain from an outbreak occurring in sister communities in the Netherlands at the time. The median number of cases reported in Canada in the past 5 years is 13 cases.

Due to the success of various programs, only 0 to 2 CRS cases are reported annually in Canada with a rate of 0-0.6 per 100,000 live births. The last reported CRS case was in 2004. Increasingly, mothers of infants with CRS are foreign-born and less likely to have been immunized against rubella before immigration to Canada. Epidemiologic and virological evidence supports that there is no indigenous rubella transmission in Canada, and the very few cases reported are imported or import-related.

Recommendations:

- All countries should ensure that strategies are in place to detect and vaccinate those still requiring vaccination. The strategies should include:
    - Reminding all health staff about measles and rubella elimination and ensuring that screening tools are in place to detect and vaccinate those that are not vaccinated;
    - Screening of antenatal women (asking for proof of vaccination) and vaccinating the unvaccinated post-delivery.
- In an effort to further enhance CRS surveillance, countries should include cases referred for TORCH testing when the clinical signs and symptoms are compatible with the case definition for suspect CRS.

5. Disease Prevention and Surveillance Activities

The Cricket World Cup (CWC) will take place in 9 Caribbean countries between 11 March and 28 April 2007. Antigua & Barbuda, Barbados, Grenada, Guyana, Jamaica, St Kitts & Nevis, St. Lucia, and Trinidad & Tobago will host matches. A 9th country (St. Vincent & Grenadines) will host warm-up matches. Thousands of visitors are expected to arrive in the host countries and

throughout the Caribbean. These visitors will come from 15 participating countries with a combined population of 1.7 billion, 78% of whom live in polio-endemic countries and 99% in measles-endemic countries. In addition to hotel rooms, cruise ships and individual family homes will be used to house guests. Three types of surveillance will be conducted: mass-gathering surveillance, routine syndromic surveillance operating at a higher level of efficiency, and EPI surveillance, also operating at a higher level of efficiency. The conditions to be monitored include:

1. Acute flaccid paralysis
2. Fever and hemorrhagic symptoms
3. Fever and jaundice
4. Fever and neurological symptoms
5. Fever and respiratory symptoms (ARI)
6. Fever and rash
7. Undifferentiated fever
8. Gastroenteritis
9. Heat stroke
10. Injuries – violence and non-violence related
11. Other events deemed important by the country.

Surveillance will be conducted in routine and additional sentinel sites, including ports of entry, private medical facilities, hotels, and medical posts at the match venues.

All systems will report on a daily rather than weekly basis and a regional rapid-response team will be trained and ready to respond to any health emergencies detected by these systems in any of the islands. The national and CAREC laboratories will also be expected to operate on a higher level with rapid turnaround of all specimens.

Some of the countries hosting CWC matches presented their activities to date regarding preparation for enhanced surveillance during the event. The plans demonstrated congruence with the guidelines set by CAREC, but also included country-specific details.

Special attention will be placed on training of health workers and port health surveillance as additional cruise ships will be in the subregion during this time. Health alert cards and information brochures will be developed for use in countries. Concerns were raised regarding the possible opportunity costs of the CWC, specifically the impact on the routine EPI program and vaccination coverage.

Recommendations:

All countries, especially host countries were strongly advised about the following tasks:

- Ensuring that all health and other front-line staff working in at-risk professions, such as customs and immigration and port health, are appropriately immunized prior to the CWC;
- Operationalizing or pilot-testing their national CWC preparedness plans to assess strengths and weaknesses, and implement corrective actions by the end of 2006;
- Including the private sector in the development and execution of these plans;
- Ensuring that systems and resources are in place for the continued and uninterrupted performance of routine EPI and surveillance activities; and
- Ensuring that vulnerable local populations are immunized to preempt the occurrence of any disease outbreaks that may arise in the event of an importation.

6. Vaccination Week in the Americas (VWA)

At the 2003 PAHO Directing Council, the Ministers of Health adopted Resolution CD44.R1 on sustaining immunization programs The Resolution urged Member States to implement yearly

vaccination weeks. The underlying principles of the VWA are equity, access, and Pan-Americanism. Activities have targeted high-risk municipalities with low coverage, urban fringe areas, borders areas, indigenous populations and ethnic minorities, and remote areas.

VWA offers a high political visibility to the regular immunization program throughout the Region, revitalizing vaccination as a priority. VWA strengthens the network between cooperation agencies, government agencies, and organized civil society. It represents an important opportunity to train health personnel, as well as to promote vaccination services to the community.

Local authorities and health workers have become increasingly aware of the need to prioritize vulnerable populations who lack access to immunization services, thereby strengthening the program's focus on equity. VWA is not another campaign, but an opportunity to strengthen the program, introduce new vaccines, and develop integrated health actions.

In 2006, the countries of the Americas exceeded their goal of 39 million people by vaccinating over 49 million. Seventeen countries vaccinated more than 18 million children aged <5 years. Eight countries vaccinated more than 4 million children aged >5 years, and more than 1 million WCBAs in six countries were vaccinated against tetanus. Four countries vaccinated 6.8 million adults (men and women) against measles/rubella, and three countries vaccinated 15 million adults aged >60 years against influenza. Four countries vaccinated more than 160,000 people in high-risk occupations, such as health care and emergency response. Brazil vaccinated nearly 50,000 of the country's indigenous people. VWA demonstrates the transition from child to family immunization. Fifteen of the 40 participating countries focused on social communication and mobilization activities. Thirteen of these were Caribbean countries or territories.

Following the example set by the Americas, the European Region held its first Vaccination Week in October 2005 and has planned to synchronize its week of activities with VWA in 2007.

As examples, Guyana, Montserrat, and Turks & Caicos presented their activities for VWA 2006. Guyana focused on awareness of the importance of vaccination in a low coverage area. The country held a national launch, in which the Minister of Health and EPI director participated. The event was covered by the media.

Montserrat vaccinated children aged 4.5-5 years and adolescents aged 14.5-15 years for a *mop-up* campaign against tetanus and measles-mumps-rubella. They also set a goal of vaccinating 100% of health workers with hepatitis B vaccine. Strategies for Montserrat included integration into the school health program for two weeks and social mobilization activities that included live radio programs, TV and radio spots, and promotional materials with logos.

Finally, Turks & Caicos focused on health education and influenza vaccination for high-risk groups. Social communication activities included local TV station advertisements and local newspaper coverage.

In order to contribute to the continued strengthening of the routine national EPI programs and to complement activities associated with VWA, the EPI managers of the Caribbean unanimously agreed to participate in VWA during the last week of April 2007. They further agreed to focus on promoting social mobilization, enhancing EPI surveillance and conducting immunization outreach for under-served populations.

Recommendations:

- Countries must maintain the VWA as a strategy to strengthen immunization programs throughout the Region, and increase visibility and advocacy of vaccination in the political agenda.

- Interventions should be targeted to population groups traditionally underserved during routine activities, such as indigenous people, and populations living in marginalized and border areas.
- VWA should be used as an opportunity to strengthen interagency and intersectoral cooperation.
- Countries should guarantee the sustainability of the VWA by including it in the EPI Plans of Action.
- The necessary human resources and logistical support, as well as the permanent monitoring of activities, must be guaranteed.
- Countries should improve the definition of goals, objectives, and target populations, as well as the information system to assess VWA impact (indicators).
- Countries should report the number of people vaccinated by population groups and by antigen, as well as the percentage of people interviewed who were aware of VWA communication activities.
- Specifically for 2007, countries are urged to use VWA as an opportunity to prevent the importation of vaccine-preventable diseases during World Cricket Cup (WCC) through enhanced surveillance. The identification of high-risk groups to be vaccinated before WCC must be included as part of the VWA goals for the subregion.
- Countries must complete the documentation of lessons learned and best practices.
- The EPI Managers must share and discuss the **Paramaribo Declaration** (Annex 3) with their Ministers of Health, Chief Medical Officers, Permanent Secretaries, and Directors of Health Services by 20 November 2006.

7. Influenza Pandemic Preparedness

WHO has recommended the establishment and implementation of strategies to increase influenza vaccination coverage for people at high risk. The goal is to vaccinate at least 50% of elderly persons by 2006 and 75% by 2010.

PAHO's TAG (2004-2006) recommended yearly seasonal influenza vaccination for populations aged >60 years, chronically ill individuals, immunodeficient populations, health professionals, and pregnant women

PAHO also encourages countries to introduce annual seasonal vaccination in the routine programs for children aged 6-23 months and supports economic studies for evidence-based decision-making.

To date, 29 countries in the Americas are conducting seasonal influenza vaccination targeting high-risk groups, which is a significant accomplishment for the Region. The greatest challenge is sustaining and improving the limited supply to meet the growing demand. The lessons learned with seasonal influenza vaccination are as follows:

- The demand created by seasonal influenza vaccine may increase the likelihood of availability of supply of the pandemic vaccine for countries;
- Strengthening of surveillance for influenza will be critical; and
- Strategic partnerships with manufacturers are critical for ensuring vaccine supplies.

PAHO is promoting technology transfer to increase production capacity of seasonal influenza vaccine in the Region, especially for Brazil and Mexico. This is critical for the availability of a pandemic vaccine for the Region.

In 2006, five Caribbean countries introduced seasonal influenza vaccine in the public sector: Barbados, Grenada, Jamaica, St. Lucia, and Turks & Caicos. Target populations include adults

aged >60 years, children aged 6 months to 5 years, patients with chronic diseases, health workers, and bird farmers.

By 2006, all countries of the Region had developed National Influenza Pandemic Preparedness Plans (NIPPPs). PAHO's technical cooperation strategy to support Member States in preparing for a pandemic include the development of the following:

- A multi-disciplinary task force on epidemic alert & response;
- Training in communication;
- Workshops on health services preparedness;
- Training and establishment of regional & national rapid response teams;
- New surveillance standards for influenza;
- A tool to assess core capacities for NIPPPs implementation; and
- NIPPP self-assessment workshops.

Key products of the Regional planning efforts include the following:

- A validated set of pandemic simulation tabletop exercises;
- Trained multidisciplinary teams, with tools to estimate potential impact scenarios;
- Communication plans and risk communication strategies in the majority of countries;
- A complete checklist for assessing pandemic preparedness;
- A comprehensive, user-friendly, self-assessment of pandemic preparedness in each country;
- A clear, agreed-upon priority plan of immediate action for completion and implementation of NIPPPs;
- An increased number of countries having introduced seasonal influenza vaccine into their national schedule in high-risk groups; and
- Shared and detailed knowledge of the WHO Global Plan and WHO Checklist for pandemic preparedness.

Strengthening general knowledge on personal respiratory hygiene among health workers and community level, along with personal advice available to the public about reducing the risk of respiratory transmission, are priority actions in all subregions. Within this component, it is necessary to complete the identification of high-risk groups for vaccination in the event of a pandemic, and forecast the demand for the subregion.

It is important to remind all in the subregion that, during a pandemic, vaccines and antivirals will probably NOT play a major role in the initial response.

Influenza Pandemic Preparedness: Caribbean Overview

Planning for a potential influenza pandemic in the Caribbean is taking place at subregional and national levels. A subregional plan has been developed by PAHO and a number of partners. This plan is focused primarily on assisting countries with the development of their national plans, training of field and laboratory personnel, and identification of a laboratory network capable of performing the necessary tests.

National plans are nearly complete for most countries, and cover the full range of responses needed from all sections of society. Seven public health laboratories have been identified with the capacity to conduct rapid testing for influenza, and three have been identified for testing of veterinary specimens. Self-assessment NIPPP workshops have been conducted with the assistance of PAHO's Communicable Diseases Unit. As a result of these workshops, issues requiring further action were identified, such as population containment.

The next step for all countries is to fully implement sentinel surveillance for influenza-like illness, including the collection of specimens for analysis in the designated laboratories. Countries should

begin by conducting field simulation that includes both collecting and sending of specimens. Further assistance is needed from PAHO to obtain supplies and receive supplemental funding for surveillance.

Country presentations outlined plan details, including the organizational structure of the national committees, the components of the plan, and inter-agency coordination. A number of plan areas need to be strengthened including surveillance strengthening, supply procurement, training, and full implementation. A concern of all countries, except Barbados and St. Maarten, was the fact that the EPI Units were not directly involved in the planning.

Recommendations:

- Strengthening of the surveillance system is key to determine virus circulation patterns and the burden of influenza, and to decide on the most appropriate timing for vaccination.
- Countries must send samples to CAREC for influenza testing.
- Coverage data is needed to target high-risk populations and evaluate program impact.
- Documentation of country experiences and lessons learned concerning targeting of high-risk groups will be useful in case of a pandemic.
- EPI managers should be part of their national influenza pandemic preparedness committees to ensure that vaccination and surveillance issues are appropriately addressed.
- Countries are requested to estimate the need for pandemic vaccine and to send PAHO their forecasts to plan the subregional demand.
- Countries should validate their national plans by executing tabletop exercises and drills.
- Countries are encouraged to implement their national plans at the local level.
- Countries should increase the sensitivity of surveillance systems to detect new types of influenza viruses.
- Countries are encouraged to continue inter-sectoral involvement and commitment and to strengthen and expand information systems for influenza.

8. New and Underutilized Vaccines

Pneumococcal Surveillance and Vaccine Use in the Caribbean

Surveillance for *Streptococcus pneumoniae* began in the Caribbean in 1998 as a pilot in 5 countries. The focus of the surveillance was on invasive bacterial diseases, mainly pneumonia, meningitis, and septicemia. The surveillance was fully implemented in 2001. From 2000-2005, 231 pneumococcal isolates were referred to CAREC for serotyping. The serotypes identified most frequently were 14, 6B, 23F, and 6A. Of 178 cases with information on age, 115 (65%) were aged <6 years.

In 2005, 30 pneumococcal isolates were referred to CAREC for serotyping, with 28 specimens from blood and CSF. The most frequent serotypes identified were 14 (10 cases), 23F (8 cases), 6A (3 cases), and 6B (3 cases). Of those with information on age, 53% were aged <6 years and 10% were aged >60 years.

Resistance to antibiotics has been steadily increasing and now stands at 20% for penicillin and 39% for sulphamethoxazole-trimethoprim. Resistance was most common in the isolates from children aged <14 years.

There are three vaccines against pneumococcus (2 polysaccharide and 1 conjugate) available in the Region; each of them contain the common serotypes in circulation. Although the recommendation is for routine use in children or, if there are cost limitations, use in children with high risk, only Bermuda and Jamaica have implemented routine vaccination. In 1983, Jamaica implemented routine use of 1 dose at age 4 years in children with severe haemoglobinopathies

using the 23-valent polysaccharide vaccine. In 2003, Bermuda implemented routine use of 4 doses per child in the regular EPI program using the 7-valent conjugate vaccine. The major limitation to routine use in childhood EPI programs is due to vaccine cost. In most other countries, the conjugate vaccine is available in the private sector for those with the ability to pay.

Recommendations:

- Surveillance should be strengthened in order to gather more quality data.
- Cost-effectiveness studies should be conducted for the subregion.
- The subregion should rationalize the use of the pneumococcal conjugate vaccine for children at high risk.

Rotavirus Vaccines

Two rotavirus vaccines, *Rotarix*, produced by GlaxoSmithKline, and *Rotateq,* produced by Merck, are now available in the global marketplace. These vaccines have undergone extensive testing in large scale clinical trials with successful efficacy and safety outcomes. The *Rotarix* vaccine is a live, attenuated, monovalent, lyophilized formulation consisting of a single human serotype (G1P8). The *Rotateq* vaccine is a liquid formulation, which is comprised of five human and bovine reassortants (G serotypes human G1, G2, G3, and G4; bovine G6; P serotypes human P1[8] and bovine P7[5]) in a sucrose buffer. *Rotarix* is administered as a two-dose regimen, while *Rotateq* is a three-dose regimen. Both of these vaccines can be safely co-administered with other antigens such as oral polio, *Haemophilus influenzae* type b and hepatitis B vaccines usually given during infancy.

Seven countries in the Americas have introduced rotavirus vaccines during 2006. Nicaragua and the USA have opted to introduce the *Rotateq* vaccine, while Brazil, El Salvador, Mexico, Panama, and Venezuela are using the *Rotarix* vaccine. Between March and August 2006, Panama administered 33,116 doses of vaccine. Between 1-20 October 2006, El Salvador administered 15,495 doses. No case of intussusception has been reported to date.

One significant challenge associated with *Rotarix* vaccine introduction relates to its packaging. The excessive volume of space required has negatively impacted cold chain storage capacity and procedures at the national, sub-national, and local levels of the health systems of all the introducing countries. The vaccine, diluent, applicator, and connector, as currently packaged, account for 111.6 cc of volume per dose. Therefore, one dose of *Rotarix* vaccine takes up space that could hold nearly 45 doses of polio vaccine.

Rotavirus Surveillance in the Caribbean

Surveillance for rotavirus (RV) disease was conducted in four countries (Guyana, St. Vincent & the Grenadines, Suriname, and Trinidad & Tobago) from May 2004 through December 2005, with Suriname and Guyana showing increases in the number of sites. The purposes of the surveillance were to determine the burden of disease and to identify the virus sub-types circulating in the countries. One sentinel hospital was used in each country except Suriname, where two were used. Records were kept on all children aged <5 years who visited the sites, all children who reported gastroenteritis (GE), and all children in whom rotavirus was identified by the laboratory. Stool specimens were collected from children suffering from GE.

Twelve percent of all medical visits by children aged <5 years at the sentinel sites were due to GE, and, of the 704 stool specimens collected, approximately one third were positive for RV. Clinical signs among the RV-positive children were indistinguishable from those of the RV-negative children. Three common RV sub-types circulated in three of the countries: G1 P[8], G3 P[8], and G4 P[8], normally with only one sub-type present at any given time. In Suriname, however, two rare sub-types, G8 P[8] and G12 P[6], circulated at different times. These were

found to be similar to circulating serotypes in Asia and are not contained in any of the current vaccines.

Recommendations:

- Surveillance for diarrheal diseases should continue or start in countries with special effort to include medical staff in the planning so that stool collection rates can be increased.
- Countries should strengthen laboratory capacity for testing for shigella and salmonella as causes of diarrhea.
- Each country must continue virus serotyping to be able to make an informed decision regarding the logistics for rotavirus vaccine introduction should the situation arise.
- There is a need for strong coordination and cohesive linkages between political and technical directors to introduce a new vaccine and the programmatic feasibility of an actual roll-out
- Countries should undertake a thorough assessment of the cold chain capacity taking into account introduction of other new vaccines, or other planned campaigns, and potential outbreaks
- A surveillance system for intussusception must be established prior to vaccination considerations.
- Training of EPI staff in all aspects related to vaccine application (reconstitution) must be conducted if the vaccine is to be introduced.

Human Papillomavirus Vaccines

The human papillomaviruses are causally associated with a number of diseases, including warts (condylomas on the genitalia and papillomas on non-genital mucosa), cervical pre-cancers and cancers in women, ano-genital cancers, head and neck cancers, and recurrent respiratory papillomatosis. However, from a public health perspective, cervical cancer represents the most important sequela of an HPV infection. Low-risk oncogenic HPV types such as 6 and 11 are associated with the development of genital warts, while high-risk types such as 16 and 18 are more frequently associated with invasive cervical cancer.

It has been estimated that every year nearly 500,000 new cases of cervical cancer and 273,505 deaths occur in women worldwide. Within the Region of the Americas, significant subregional disparities in cervical cancer burden are evident as incidence and mortality rates in Latin America and the Caribbean are four to five times higher than in North America. Within the Caribbean, the highest burden is observed in Guyana and Haiti.

Two prophylactic HPV vaccine candidates have undergone extensive clinical trials with successful efficacy and safety outcomes. These are Merck's *Gardasil* vaccine, a quadrivalent liquid preparation consisting of low-risk HPV types 6 and 11 and high-risk oncogenic types 16 and 18, GSK's *Cervarix,* a bivalent liquid formulation consisting of HPV types 16 and 18. It is important to emphasize that these vaccines are made from virus-like particles, which do not contain any infectious DNA, but are rather major viral capsid proteins that have been produced in expression systems. The catalogue price for a single dose of the Merck vaccine is US $120.00. The price of the GSK product is unknown at this time. The quadrivalent product has been licensed in 42 countries worldwide, including 6 countries in the Region of the Americas.

Surveillance measures of HPV vaccine impact would include reductions in cervical cancer incidence and mortality, reductions in the prevalence of cervical intraepithelial neoplasia grades 2 and 3 (CIN2, CIN3), and changes in the prevalence of HPV types 16 and 18. The data required to substantiate these changes would be gathered from a variety of sources, which may include cancer registries, hospital discharge databases, vital statistics certification of cause of death, CIN2-3 histology registers, and periodic HPV DNA population-based surveys.

In order to further the HPV vaccine introduction agenda in the Caribbean, the following activities are crucial for implementation by EPI Managers:

- Increasing knowledge about HPV vaccines, their efficacy, and the indications for their use;
- Collaborating with the key stakeholders, who are important in any discussion on cervical cancer prevention and control, and adolescent health providers to facilitate advocacy for cervical cancer prevention through vaccination;
- Gathering data and analyzing the burden and economic costs of cervical cancer in individual countries and the subregion;
- Gathering data for vaccine needs forecasting; and
- Evaluating long-term cold chain capacity needs.

It is important to note that HPV vaccination and screening are essential and complementary preventive tools in any effective cervical cancer prevention and control program.

Trinidad has prepared a preliminary proposal for the determination of the prevalence and serotyping of HPV infections in adolescent girls aged 15-19 years. The rationale for this is that 11.6% of all mortality in Trinidad is due to cancers, 15% of which result from cervical cancer. Details of the study will be finalized for implementation in late 2007. The results of the pilot and later larger study will be used to develop a policy on HPV vaccine introduction, which is being considered for girls aged 9-26 years.

Recommendations:

- A smaller Caribbean meeting should be convened during the first half of 2007, bringing together the key stakeholders to more fully articulate the issues around HPV prevention and control and to better position the countries of this subregion to make well informed decisions about HPV vaccine introduction. At this meeting, a decision should be made on which HPV vaccine should be considered as part of the program for cervical cancer.
- Countries should consider collaborative studies to determine HPV prevalence and genotypes in the subregion with the support of PAHO.

9. EPI Evaluations and Activities

EPI Evaluation: Bahamas

A comprehensive evaluation of the immunization program was conducted in the Bahamas in 2006. The main objectives of the evaluation were to:

1. Assess the status of planning, organization, and execution of services of the immunization program, including cold chain and biosafety procedures, and to validate the surveillance system;
2. Define strengths, weaknesses, and factors that facilitate and hinder the achievement of objectives of the program;
3. Use the data gathered for timely decision-making and for development of a five-year plan of action aimed at program strengthening; and
4. Determine user satisfaction.

The evaluation found that the government has been committed to the EPI and has shown its commitment through fully funding the program and ensuring adherence to vaccination and surveillance strategies. Vaccination coverage rates for all antigens have been >90% for the past

10 years with subsequent positive impact on disease incidence. Although there are deficient human resources at many levels, staff have managed to maintain satisfactory cold chain systems and good vaccination practices. Areas for strengthening include:

- Documentation of vaccinations in health records;
- Updating of the EPI manual;
- Training of health staff in various aspects of EPI;
- Development of an inventory and replacement plan for the cold chain;
- Development of a management system for vaccines receipts and dispatch;
- Information flow between the public and private sectors.

Challenges for the program include maintaining $\geq$95% vaccination coverage for all antigens, strengthening the surveillance system, ensuring that training needs are met, maintaining good supervision, and developing an efficient management system for the receipt and dispatch of vaccines.

EPI Meeting: Aruba and the Netherlands Antilles

The EPI Meeting of Aruba and the Netherlands Antilles was held on 28-29 September 2006 in Bonaire. The meeting was attended by participants from all the islands and two PAHO technical staff. The objective of the meeting was to exchange ideas and share experiences of each island to strengthen the coordination and collaborative effort of the program. The conclusions from the discussions were that there is a need for training on managing the EPI database, the surveillance system needs to be implemented, problems with biohazard waste disposal require addressing (no incinerator available), a data log must be used for temperature control, and it is necessary to map the baby clinics and their spatial distribution over the islands.

The group made the recommendations for a new schedule - changing the age for administration of the 2nd MMR dose at age 4 years, considering the introduction of new and underutilized vaccines (hepatitis B, pneumococcus, RV, and HPV), and buying vaccine at better prices through the PAHO Revolving Fund. The main challenges faced by the islands are to implement the surveillance system, train health care workers in surveillance skills, prepare and implement pandemic preparedness plans, participate in the Revolving Fund for vaccine procurement, and reach coverage of 100% for all administered antigens.

Vaccine Refusal Survey: Dominica

Over the past fifteen years, Dominica has provided its citizens with one of the highest level of vaccination coverage available throughout the world. However, the less than two percent of parents who refused to immunize their children yearly have raised concerns among health authorities. In 2005, the Ministry of Health conducted a pilot study to identify factors influencing mothers in their refusing vaccines for their children.

Ninety two percent of the refusers (38) for the past ten years were interviewed along with a control group of 91 compliers (ratio 2.3:1). The results of this study indicated that the majority (88.2%) of respondents recognized the importance of immunization. Interestingly, this included most (60.6%) of the parents who refused vaccines. Furthermore, 63% of the refusers have had one or more of their children immunized.

The most common reasons given by parents for vaccination refusals were as follows:

- Vaccines did not provide protection against diseases;
- Vaccines were too dangerous as they were made from lives viruses;
- Their children were too small for these vaccines; and
- Their religion did not believe in vaccination.

The recommendations from this study are as follows:

- Conduct a more comprehensive survey in 2007 to include more family members of unvaccinated children.
- Develop a special campaign with emphasis on faith-based organizations and media personnel.
- Develop policies and legislations for the management of vaccine refusers.

10. Program Management

Caribbean Growth Record

Countries have always expressed a desire to change their growth records because of changes in their immunization schedules, the introduction of other surveillance data, and the introduction of centralized computerized national databases.

Concurrently, WHO has been looking into changing current growth charts due to their limitations. The reference charts were constructed based on studies involving children aged 0-3 years selected from only one community in the USA, and were reflective of persons who were only of European descent. Therefore, WHO conducted a multi-country study and produced a new international reference showing how children SHOULD grow in ALL countries. This study was based on children from diverse populations and cultures; however, all had in common that they were exclusively breast-fed, their parents did not smoke, and their families adopted other positive health lifestyles.

The new growth record includes measures for weight for age, length/height for age, weight for length/height, head circumference, developmental growth assessment, and BMI. Even though the growth charts are to be plotted for children up to 5 years of age, the record also provides for the inclusion of pertinent data for the management of all persons from birth to 24 years (youth). The generic Caribbean growth record will be shared with all countries for their feedback and then finalized for member countries to consider possible adaptation and adoption.

Recommendations:

- The Caribbean growth record should include anticipatory guidance for parents, especially in the area of safety in the home and first aid.
- Countries should start identifying sources of measurement tools.

Family Immunization: Conceptual Framework

A panel of six countries was convened to consider the framework and logistic issues regarding a shift from child to family immunization. The panel presentation considered five broad categories in the development of the conceptual framework: health service delivery system, population, vaccine-related issues, information systems, and communication.

In order to facilitate the implementation of the WHO GIVS and ensure the achievement of the MDGs by 2015, the family immunization approach was considered a necessity. It would require a re-orientation and an integrated approach to health services, as well as a life cycle approach or risk approach to determine population groups to be vaccinated. Consideration for vaccine availability, cost, and burden of disease would also be required, along with practical approaches to the implementation of an immunization schedule appropriate to the target groups.

A strengthened information system was deemed necessary for client documentation, monitoring and evaluation of program implementation, impact on disease reduction, ESAVI monitoring, and provision of feedback to stakeholders. However, building on existing EPI experiences and using

new technologies would assist in addressing the challenges encountered. It was agreed that communication with key decision-makers is essential in considering policy development and the transition or re-orientation of the current EPI program. Intersectoral collaboration is required in addition to the private and public sector health partners. Health education and training for the family and healthcare providers were also considered an important process for effecting change, while planning was considered essential.

Recommendation:

- EPI Managers should review the existing health structure in countries and begin discussion with other stakeholders on the family immunization approach to formulate a plan for discussion at the next EPI Managers' Meeting in 2007.

Database Systems for EPI Surveillance and Plans of Action

CARICOM countries currently use multiple information technology tools including MESS, PESS, and EPI Tables for data entry, analysis, and reporting. Currently PAHO is developing and Integrated Surveillance Information System (ISIS) software for all vaccine-preventable diseases. The system will enable the MOHs to enter individual case information and laboratory data.

The goal is to support all types of users through the use of any of the three products being developed in three phases. In Phase 1, a stand-alone database system will be developed. Phase 2 will focus on a data bridge that will integrate with national surveillance systems in countries. Phase 3 will focus on development of a Web-based surveillance system for data entry and transfer, as well as downloading database reports. Various technologies and lists of diseases/conditions will be integrated into one platform so that software and database incompatibility among countries will not limit rapid data collection. The new system will provide features such as GIS tools for mapping cases and showing clusters of cases. The system is expected to be completed for deployment to countries by March 2007.

The EPI Plan of Action database is a tool developed by PAHO's Immunization Unit which attempts to integrate the different management functions with the technical and specific objectives necessary for meeting epidemiological targets. The database is divided into nine main areas of action as follows:

1. Biologicals and Logistics (Vaccines, Syringes, and Supplies)
2. Cold Chain
3. Training
4. Social Mobilization
5. Operating Costs
6. Supervision
7. Epidemiological Surveillance
8. Research
9. Evaluation

Each area includes fields for multiple activities and identification of various funding sources. The tool allows users to collate activity data by areas, and to create detailed and summarized reports by target areas and years. The application software also allows to export and import data tables by year to facilitate data transmission and integration into other software packages such as Excel.

Updates from WHO SIGN & TECHNET Meetings, October 2006

An overview of these global meetings convened in Mexico City was provided. The Safe Injection Global Network (SIGN) focused on health worker and injection safety, ensuring hepatitis B vaccination for health workers, matching quantities of vaccines and needles, and safety boxes in easy reach of health workers.

The strategies include the following:

- Developing policies for safe injections at national level;
- Ensuring quality and safety of injection devices;
- Improving access to quality needles, syringes, and safety boxes; and
- Ensuring proper use of injection equipment through the promotion of behavior change in health workers.

The TECHNET meeting focused on the new technologies in support of vaccine cold chain management. One of the new technologies for monitoring the thermostability of vaccines purchased through the Revolving Fund was reviewed. An electronic temperature monitor (Figure 11) will be activated at the time of packaging by the manufacturer. The monitor will be able to last for 10 days and will have a built-in alarm. Only one monitor will be used per shipment of vaccines.

Figure 11. Electronic Temperature Monitors

Two listed in the PIS, pending launch of PQS.

Qtag2 plus (Switzerland)

SpyTempII OMS (France)

Two under evaluation by WHO.

(expected to be listed in the PIS shortly)

3M TX (Germany)

LogTag (New Zealand)[6]

Source: WHO

Recommendation:

- A training workshop on electronic monitors for vaccine store staff should be conducted in advance of the launching of this new technology, preferably in the first or second quarter. Barbados was proposed to host this workshop in May or June 2007. However, if a 1st quarter date is required, an alternate site should be identified from among the non-host Caribbean countries of CWC 2007.

Procurement through the Revolving Fund: Current Practices and Future Potential

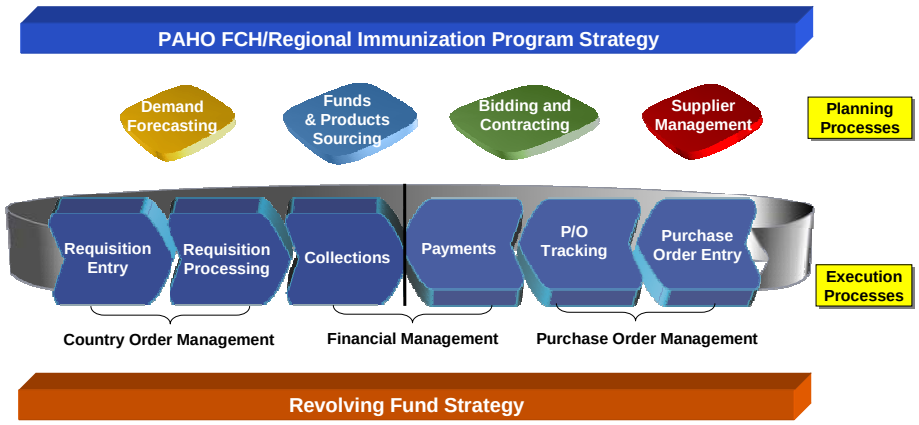
The PAHO Revolving Fund has contributed to greatly reducing the administrative burden of government procurement of vaccines and syringes, and improving methods to secure budgets and sources for buying. The Revolving Fund acts as an agent for participating countries and provides the following services:

1) Demand management (forecasting and aggregation);
2) Contract negotiation and management;

3) Purchase order administration;
4) Financing and fund sourcing (budgeting); and
5) Payments and supplier relationship management.

In 2005, PAHO contracted The Latin American Logistics Center (LALC) of the Georgetown University to undertake a comprehensive assessment of the Revolving Fund supply chain. This included a rigorous analysis of the Fund's current planning and execution processes and practices (Figure 12), with a view to identifying improvements that reduce costs and improve service. In addition to formally defining the Fund's supply chain, the preliminary findings of the LALC assessment proposed recommendations on a range of Revolving Fund functions that PAHO is currently considering.

Figure 12 . PAHO/FCH Regional Immunization Program Strategy



Source: Revolving Fund Study, LALC, Georgetown University.

The assessment has also highlighted what improvements are needed within the supply chain, with approximately 15% located within PAHO's management of the Fund, 25% with the suppliers, and 60% with countries. This analysis has enabled the precise development of strategies to address efficiency gains in these three elements of the supply chain, including the use of the WHO EVSM tool.

Caribbean Plan for Quality Control of Syringes

With very few exceptions, the countries of the Americas import 80% of their medical devices; however, only a few countries have systems to regulate safety, quality, and effectiveness or have the technical capability to set up this kind of program.

An initiative was developed to establish a regional laboratory network for the quality control of syringes. In the first phase of this initiative, personnel selected from six countries were trained at the ECRI Institute, a reference laboratory, in the various protocols for assessing conformity of the syringes to the relevant ISO standards. The Caribbean was represented by a microbiological analyst from the Bureau of Standards from Jamaica.

In the development of this plan for the Caribbean, the trained person is expected to establish a laboratory in Jamaica, validate the tests, and send validation results to PAHO. Support is also to be given to other countries in the Region in the evaluation of the quality of syringes. PAHO made

a commitment to provide the Jamaican laboratory with the standards, protocols, and laboratory equipment, as well as assistance in obtaining certification.

The Bureau of Standards of Jamaica, an organization already recognized for its role in standardization, regulatory activities, and metrology and testing, is now preparing to implement the plan for quality control of syringes in the subregion.

IV. Financial Analysis of 2007 National Work Plans

All countries attending the meeting presented and discussed their 2007 national work Plans of Action, outlining technical components and activities, including the cost per activity and area of action. The total cost for the EPI in the English- and Dutch-speaking Caribbean and Suriname for 2007 is in the order of US $16.1 millions, of which $15.2 millions (94.4%) will come from national budgets.

V. Surveillance and Immunization Awards

An annual **Caribbean Surveillance Award** has been established to recognize countries that have performed outstandingly in the surveillance component of their program during the previous year. The award is based on two main criteria: on-time reporting and 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, until a new country is selected to receive the award. The award is announced during the annual Manager's Meeting.

Barbados received the 2006 Caribbean Surveillance Award. Awards for the second and third place went to St. Kitts & Nevis and Antigua & Barbuda, respectively.

The **Henry C. Smith Immunization Award** is an award in honor of Mr. Henry Smith who was the first PAHO-EPI Technical Officer for the Caribbean subregion. His service in the Region spans 18 years. The immunization award is awarded to the country which has made the most improvement in EPI.

The 2006 Henry C. Smith Immunization Award is presented to Guyana.

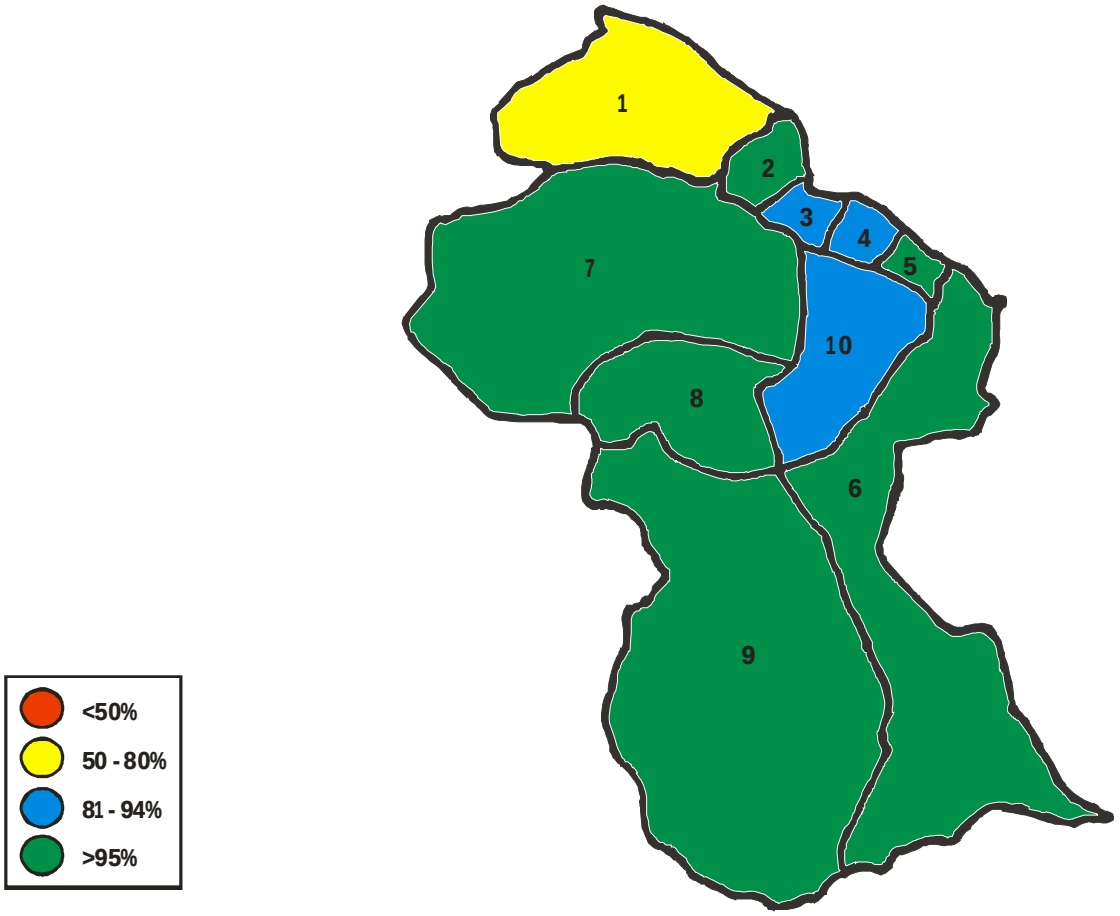
Participants at the 23rd Caribbean EPI Managers' Meeting congratulated these countries for being the recipients of awards and extended their compliments to all their health workers for such outstanding performances.

The 24th EPI Managers' Meeting will be held in November 2007.

A N N E X E S

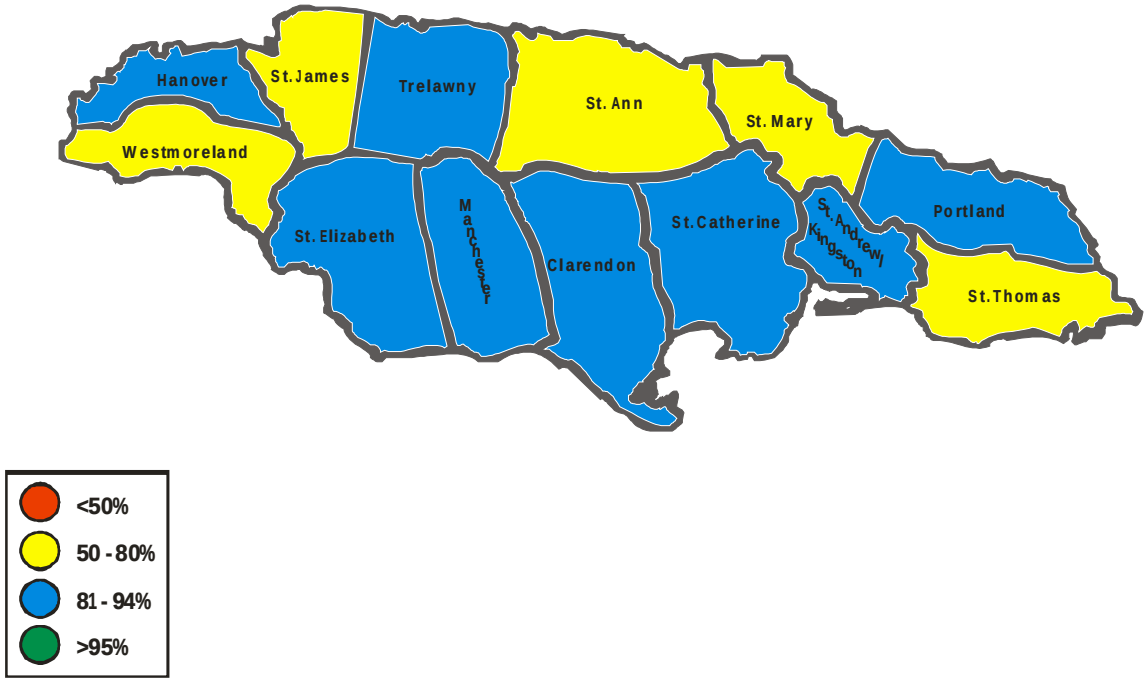
ANNEX 1

M.M.R. Vaccine Coverage 2005
GUYANA



ANNEX 2

M.M.R. Vaccine Coverage 2005
JAMAICA



ANNEX 3

The Paramaribo Declaration

At their 23rd Annual Meeting in Suriname from 13-17 November 2006, the Caribbean EPI Managers:

Acknowledging that the 2007 Cricket World Cup is a highly important event for the Caribbean countries;

Recognizing the tremendous progress made in the subregion in immunization and the importance of protecting the achievements, including the eradication of poliomyelitis and the elimination of indigenous measles, and rubella, and congenital rubella syndrome;

Acknowledging that poliomyelitis, measles and/or other vaccine-preventable diseases are endemic in other Regions of the world and are still endemic in many of the countries participating in the 2007 Cricket World Cup;

Realizing the health implications of this event and the high risk of poliomyelitis, measles, and rubella virus importations into the Caribbean subregion;

Recognizing that vulnerable high-risk groups still remain in the subregion and that national immunization programs face many challenges due to this event;

Acknowledging that highly effective tools, such as surveillance and vaccination, exist and should be enhanced prior, during, and after this event; and

Recognizing that the host countries of the Caribbean have developed preparedness plans for disease surveillance and outbreak containment, focusing on vaccine-preventable diseases.

1. Accordingly declare that:

    1. It is critical to intensify epidemiological surveillance and appropriate vaccination activities for all susceptible local populations;
    2. Political commitment is necessary and should be translated into tangible resources to guarantee the implementation of surveillance plans and maintenance of high vaccination coverage;
    3. Health care workers in the public and private sectors at all levels of the system should be alerted to the possibility of importation of measles, rubella, poliomyelitis, and other infectious diseases not commonly seen in the subregion;
    4. Personnel and volunteers from the health, tourism, sports, and transportation sectors should be immune to poliomyelitis, measles, and rubella before the arrival of cricket world cup participants because, in the event of an importation, such personnel, if susceptible, may serve as transmission agents because of their frequent contact with the general public.

2. In this context, the Caribbean EPI Managers acknowledge the excellent support provided by PAHO to Member States and gratefully request that:

    1. PAHO accelerate communications with WHO and other partners to help advise that every visitor coming from outside the Region to participate in the 2007 Cricket World Cup:

        i. Be immune against poliomyelitis, measles, and rubella prior to arrival at the Cricket World Cup in the Caribbean; and, when appropriate,
        ii. Be advised to receive poliomyelitis- and/or measles/rubella-containing vaccines, ideally at least two weeks before departure from their country if there is no vaccination card available or written proof of vaccination. This time is required for a newly vaccinated person to develop protection.

    2. Effective coordination and commitment be provided by all levels of society, including the local, national, subregional, regional, and global levels to maintain the achievements of the Americas, which is a high priority for all countries of the Region; and

    3. This declaration be further referred to as “The Paramaribo Declaration.”

Paramaribo, Suriname, 17 November 2006.

Twenty-Third Caribbean EPI Managers' Meeting

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