Pan American Health Organization
Regional Office of the World Health Organization

Immunization Unit
Family and Community Health Area

TWENTY-SECOND CARIBBEAN EPI MANAGERS' MEETING

FINAL REPORT

Bermuda
29 November – 2 December 2005

TABLE OF CONTENTS

Acronyms

AFP	Acute Flaccid Paralysis
BCG	Bacille Calmette-Guérin
CAREC	Caribbean Epidemiology Centre
CARICOM	Caribbean Community
CCH	Caribbean Cooperation in Health
CPC	Caribbean Program Coordination
CRS	Congenital Rubella Syndrome
CSME	Caribbean Single Market Economy
CSF	Cerebrospinal fluid
DPT	Diphtheria-polio-tetanus vaccine
DPT3	Third dose of diphtheria-polio-tetanus vaccine
dT	Reduced diphtheria-tetanus vaccine
EID	Emerging Infectious Disease
EPI	Expanded Program on Immunization
ESAVI	Event Supposedly Attributable to Vaccine or Immunization
GBS	Guillain-Barré Syndrome
GIS	Geographical information system
Hep B	Hepatitis B
Hib	*Haemophilus influenzae* type b
HPV	Human papillomavirus
HHV	Human Herpes Virus
ICC	Interagency Coordinating Committee
IPPP	Influenza Pandemic Preparedness Plan
IPV	Inactivated polio vaccine
ISIS	Integrated Surveillance Information System for Vaccine-preventable Diseases
JRF	PAHO-WHO/UNICEF Joint Reporting Form
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
NRA	National Regulatory Agency
OPV	Oral polio vaccine
PAHO	Pan American Health Organization
PESS	Poliomyelitis Surveillance Elimination System
RF	PAHO Revolving Fund for Vaccine Procurement
RV	Rotavirus
SARS	Severe Acute Respiratory Syndrome
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
VAPP	Vaccine-associated paralytic poliomyelitis
VDPV	Vaccine-derived poliovirus
VLP	Virus-like particle
VWA	Vaccination Week in the Americas
WCBA	Woman of childbearing age
WHO	World Health Organization

Executive Summary

The control of vaccine-preventable disease remains exemplary in the countries of the sub-Region, and all should be congratulated on their efforts. Currently, all countries but one include Hib and hepatitis B vaccines in their national schedules. The last country to introduce these vaccines will do so in 2006. In 2004, the average coverage for BCG, DPT 3, polio 3 and MMR was over 85%; with nine countries reaching a coverage ≥95%. No measles cases have been confirmed since 1998 - despite careful surveillance. No confirmed rubella has occurred since 2001 and the last case of CRS occurred in 1999, in Suriname. Integrated measles/rubella and CRS surveillance has been implemented in the sub-region. Surveillance indicators are being met, except one: the percentage of samples arriving to the laboratory within ≤5 days of blood collection. Only 31% of samples arrived at the CAREC laboratory within 4 days of collection in 2005 (week 43). EPI managers should communicate with the laboratories to ensure that in-country mechanisms for specimen transportation are in place and that specimens are shipped to the CAREC laboratory as quickly as possible.

In 2005 (week 43), the AFP rate in children <15 years was 0.64, down from 0.77 in 2004 and 1.32 in 2003. Validation of the AFP surveillance system was done in Aruba, the Netherlands Antilles, and St. Lucia in 2005; no AFP case was identified. Countries need to be diligent in identifying and investigating AFP cases. The Caribbean sub-region continues assessing laboratories to identify those with wild poliovirus infectious, or potentially infectious, materials. All countries should list their laboratories and the tests they offer, as well as check laboratories with -20^{o}C capabilities for potential wild poliovirus-containing material. Until the world is certified polio-free, PAHO maintains its OPV policy and advises countries considering IPV introduction to take burden of disease, perceived risk, and opportunity costs into account.

Caribbean countries are taking the influenza pandemic threat seriously. Seventeen of the 21 countries have held at least one planning committee meeting and have a plan outline or a draft. Next steps include finalizing national preparedness plans, confirming the laboratory networks in the Region, hosting a sub-Regional meeting, and training and conducting simulation exercises. The participants of the meeting unanimously endorsed the activities outlined in the “PAHO Strategic and Operational Plan for Responding to Pandemic Influenza” and requested PAHO to provide guidelines on the prioritization of target groups for pandemic influenza vaccination.

Seasonal influenza vaccine is now available for Caribbean countries inexpensively through the PAHO Revolving Fund. The demand for seasonal influenza vaccine may increase production capability and the availability of a pandemic vaccine. Six countries –Anguilla, Aruba, Bahamas, Bermuda, Cayman Islands, and the Netherlands Antilles– include seasonal influenza vaccine in their schedule. Three others –Grenada, Trinidad & Tobago, and Turks & Caicos– plan to add this vaccine for the 2005-2006 season. Countries are encouraged to study the burden of influenza in their populations and, where justified, add it to their immunization schedule. Countries already using the vaccine should determine the impact of the vaccine in morbidity and mortality.

With regards to new vaccines, countries were encouraged to implement rotavirus surveillance, or to strengthen the hospital-based systems recently implemented in four

Caribbean sites, to make informed decisions regarding the introduction of rotavirus vaccine. Countries were reminded that the mortality rates due to cervical cancer are disproportionately high in the Caribbean, and that effective prophylactic human papillomavirus (HPV) vaccines are likely to be licensed in the near future. Countries were urged to gather data on the burden of cervical cancer in individual countries and to initiate dialogue with relevant stakeholders around the topic of cervical cancer prevention through HPV vaccination.

Misinformation with regards to immunization safety can severely jeopardize the achievements of immunization programs and debilitate public trust in vaccines. Countries need to continue their efforts to ensure that health professionals and the public are well informed about vaccination safety issues. Events supposedly attributable to vaccination or immunization (ESAVIs) need to be investigated promptly, and the investigation should be clearly and carefully documented.

Effective management and supervision of implementation of EPI Plans of Action remain the backbone of the Caribbean program. All countries were advised to use immunization legislation to ensure a budget line for vaccines and supplies. Additionally, PAHO will complete the Regional Plan for syringe quality control and the Revolving Fund will complete an evaluation aimed at expanding its role as in-bulk purchaser. This will allow the Revolving Fund to improve its efficiency and position itself for new vaccine introduction, thus better serving the countries of the sub-region.

The importance of accurate data to make informed decisions was highlighted throughout the meeting.

The EPI managers of the Caribbean countries should be congratulated for their tireless efforts to reach all children and protect them from vaccine-preventable diseases. Governments must continue to keep immunization high on their lists of priorities.

I. Introduction

The 22nd Meeting of the Caribbean EPI Managers was held in Bermuda, from 29 November to 2 December 2005. Dr. Elizabeth Ferdinand, Senior Medical Officer of Health, Barbados, chaired the meeting, and Dr. Jon K. Andrus, Chief, Immunization Unit, PAHO, served as secretary. Participants were welcomed by the Hon. Patrice K. Minors, JP, MP, Minister of Health and Family Services, and Dr. John Cann, Chief Medical Officer, Bermuda. Hon. Minors described immunization as one of the greatest achievements of modern medicine and public health and highlighted the collective efforts of the Americas that have resulted in significant achievements in vaccine-preventable disease elimination. The Hon. Minister commended the dedication and commitment of nurses and public health practitioners throughout the Region and commented on the role of PAHO in providing technical assistance and procuring vaccines for the Americas. She mentioned some of the challenges that immunization programs face in their efforts to reduce or eliminate vaccine-preventable diseases, such as the cost of new vaccines, vaccine availability, and the under-immunization of some groups. Finally, the Hon. Minister urged the participants to continue working towards improving individual country programs as well as Regional initiatives.

Dr. Andrus addressed the audience emphasizing that the Region of the Americas is faced with many challenges in order to sustain national immunization programs in the context of completing the unfinished agenda and introducing new and under-utilized vaccines. He stated the priority strategies to reach these challenges: eliminating rubella and congenital rubella syndrome, sustaining measles elimination and polio eradication, and introducing vaccines with policies that are grounded in the best science available. Eliminating rubella and sustaining measles and polio eradication will help ensure equity and access to health services because every community must be reached to achieve and sustain these targets. The Regional plan of action described in this presentation includes a detailed outline of activities intended to strengthen the technical assistance that PAHO provides to member countries to sustain their national immunization programs. Ensuring technical excellence, improved efficiency of the management of PAHO's EPI Revolving Fund for vaccine purchase, effective vaccine legislation, and expanded fiscal space are all critical for future country support. Dr. Karen Lewis-Bell, Director of Family Health, Ministry of Health, Jamaica, summarized the main recommendations from the XXVI Meeting of the Technical Advisory Group (TAG) on Vaccine-preventable Diseases held in Mexico City in 2004.

The meeting brought together over 70 health officials from 24 countries of the English-speaking Caribbean, Suriname, Aruba and the Netherlands Antilles (Bonaire, Curacao, Saba, St. Eustatius, and St. Maarten), Canada, and the United Kingdom. PAHO Immunization staff, representatives from the Caribbean Epidemiology Centre (CAREC), the Caribbean Program Coordination Office (CPC), CARICOM, the Christian Children's Fund, and UNICEF also attended.

II. Objectives of the Meeting

In addition to EPI program reviews and review of the 2005 annual plan of action, the main objectives of the meeting included:

1. Analyzing the status of measles eradication with emphasis on the *follow-up* campaign activities and the integrated fever/rash surveillance system;
2. Evaluating the status of rubella/CRS elimination in the countries;
3. Sustaining the eradication of wild poliovirus in each country;
4. Analyzing the status of the EPI programme in each country;
5. Setting 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 2006;
6. Updating information on selective topics of common interest to countries in relation to immunization, delivery service, and surveillance of measles/rubella and other EPI diseases;
7. Discussing the status/improvement of surveillance/monitoring of adverse reactions to vaccines;
8. Discussing the introduction of vaccines such as rotavirus, influenza, and HPV, in the EPI in countries;
9. Discussing the status of implementation of the Rotavirus Surveillance System in selected countries;
10. Developing plans for the 2006 Vaccination Week in the Americas (VWA) and completing the table provided;
11. Discussing the challenges encountered in obtaining immunization budget; and
12. Developing an action plan with a specific budget for each activity for each country to achieve the targets and objectives set for 2006;

At the end of the meeting, each country must have its 2006 Plan of Action and an idea of the annual financing for the EPI.

III. Immunization and Vaccine-preventable Diseases

1. Overview of the Expanded Program on Immunization

Immunization has resulted in some of the major feats achieved in public health. Operational expertise and political commitment have contributed significantly to these achievements. The governments of the Caribbean Community remain committed to the EPI.

The Immunization Programme:

Since the EPI was established in the countries of the Caribbean Community in 1977, the following milestones have been achieved:

- 1978-80 – EPI fully implemented in the countries of the Caribbean Community.
- 1982 – Last indigenous polio cases in Jamaica.
- 1988 – The Ministers of Health of the Caribbean Community resolved to eliminate indigenous cases of measles.
- 1991 – PAHO-guided measles elimination activities were implemented in the countries of the Caribbean Community.
- 1998 – CARICOM Ministers of Health resolved to eliminate indigenous rubella and CRS from the countries by the end of 2000.

Vaccination of the target population is mainly done in the public health sector through the network of clinics in the countries. However, the private sector continues to play an important role. In most countries the vaccination schedule is similar for both sectors. The Ministry of Health (MOH) in most countries has the role of auditing and monitoring of the EPI (such as cold chain status) in the private health sector. Immunization data of the private sector is usually sent to the MOH in most countries.

Vaccines Introduced in the Infant Schedule:

The vaccines that are administered routinely in the public sector are the following: BCG, diphtheria, tetanus, pertussis (whole cell or acellular), poliomyelitis (oral live attenuated or inactivated), hepatitis B, *Haemophilus influenzae* type b, measles, mumps, rubella, yellow fever, pneumococcal, varicella, and influenza. Various vaccine combinations such as trivalent, tetravalent, and pentavalent are being used.

Haemophilus influenzae type b (Hib) and hepatitis B vaccines are a part of the infant immunization schedule in the public sector in all countries except Dominica. Fifteen countries are using the pentavalent combination vaccine - DPT/Hep B/Hib. Suriname introduced hepatitis B and Hib vaccines in the form of the pentavalent combination in July 2005. Dominica is slated to do the same in 2006.

Invasive Bacterial Infection Surveillance:

The surveillance system for invasive bacterial infection was started in 1998 and five countries –Barbados, Guyana, Jamaica, St. Vincent & the Grenadines, and Trinidad & Tobago– were part of the system. Presently, all countries report cases of Hib and pneumococcal diseases, but isolates are mainly sent for pneumococcal testing.

For 2003, 40 pneumococcal isolates were referred to CAREC for serotyping. The specimens were from blood and cerebrospinal fluid (CSF). The most frequent serotypes identified were 14 (13 cases), 6B (12 cases), and 6A (4 cases). Of those with the information on age, 58% were aged <5 years. Twelve (12) isolates of Hib were referred to CAREC for serotyping in 2003. These isolates were equally from blood and CSF; 11 isolates were type b and 1 was type a.

For 2004, 38 pneumococcal isolates were referred to CAREC for serotyping. The cases were sent from 3 countries. The specimens were mainly from blood and CSF. The most frequent serotypes identified were 14 (9 cases), 6B (8 cases), and 19 (3 cases). Of those with the information on age, 56% were aged <2 years and 80% were aged <5 years.

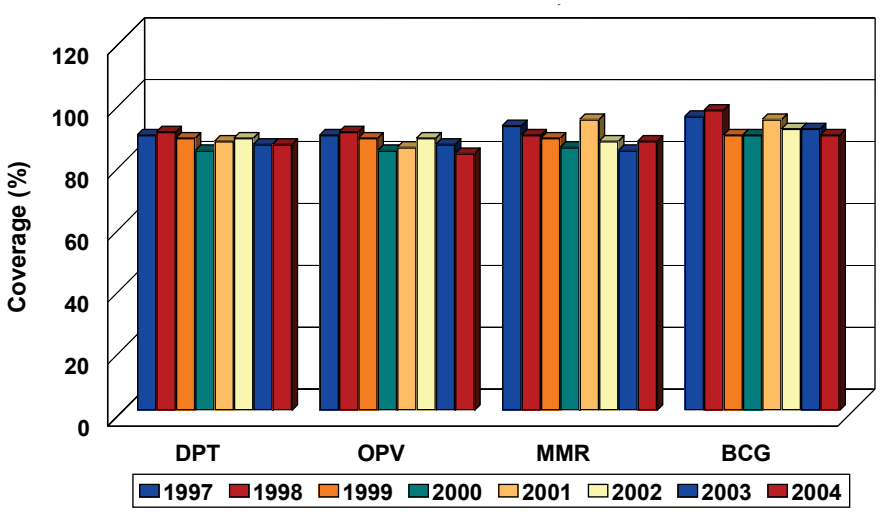
Immunization Coverage:

The overall vaccination goal for countries involves achieving equity in provision of the vaccination services. The specific objectives are:

1. To achieve ≥95% national coverage per biological;
2. To achieve ≥95% coverage at municipality level; and
3. To achieve ≥95% children living in municipalities with ≥95% coverage.

In 2004, the average coverage for all countries for the 3rd dose of DPT and polio was 86% and 86% respectively. For the 1st dose of MMR and BCG, coverage was 87% and 89%, respectively (Figure 1).

Figure 1. Immunization Coverage for Selected Antigens, CAREC Member Countries, 1997-2004



The overall coverage has remained relatively constant in almost all countries (except in Jamaica and Suriname). Nine countries have sustained a vaccine coverage >95% and therefore achieved objective 1, while seven countries had coverage >90% for all antigens.

Vaccination coverage of selected countries were reviewed according to their geopolitical units. For 2004, Guyana had 7 regions with coverage 80 to 94% for all antigens; however, coverage for 2 of the 7 regions was 92% and 94%. In Jamaica only 1 of the 14 sub-districts has MMR coverage >95% and 4 parishes have coverage <80% (Table 1).

Table 1. Distribution of MMR Coverage (children aged 12-23 months) in Districts of Selected Countries, 2004

Country	Target Population 2004	MMR Coverage (%)		Number of Administrative Areas	Administrative Areas MMR % Coverage 2003				Population Not Received MMR 2004
		2003	2004		<50	50-79	80-94	>95	
BELIZE	7,830	96	95	6 Districts	0	0	2	4	247
GUYANA	16,731	89	88	10 Regions	0	0	7	3	1,961
JAMAICA	51,509	79	80	14 Sub-districts	0	4	9	1	10,089
TRINIDAD/TOBAGO	17,116	88	95	9 Counties	0	0	3	6	913

Source: MOH Reports to EPI/CAREC

Vaccination coverage for Suriname has increased compared to 2003. Vaccination activities during VWA, held each year for a week in April, have assisted in identifying and finding defaulters.

Other Vaccine-preventable Diseases:

There have been no cases of diphtheria or neonatal tetanus reported between 2003 and 2005 (Week 43). Four cases of pertussis-like syndrome were reported from Jamaica and two cases of non-neonatal tetanus have been reported from 2 countries.

Vaccine and Logistics Procurement:

By late 2005 (Week 43), interruption of the supply of vaccines in countries has been minimal. All countries had an adequate supply of syringes and needles. Natural disasters have occurred in some countries, but with minimal or no loss of vaccines, supplies and equipments.

Conclusion:

The immunization programme continues to make progress, although facing major challenges of increasing and sustaining high vaccination coverage. Effective management and supervision still remain major goals of the programme. Bahamas, Jamaica, Netherlands Antilles, and Suriname will be the priority countries for 2006. EPI Managers of the subregion would like to acknowledge the tireless efforts made by the committed and dedicated health practitioners to reach and protect all children.

2. Ensuring Compliance with Vaccination

Ensuring compliance with vaccination must be an on-going activity of the EPI in the countries and this requires the dedication and commitment of all health workers. While specific immunization legislation on compulsory vaccination will be beneficial, countries must have a detailed protocol outlining the procedures to be implemented for identification and management of defaulters or refusals for vaccination.

The health staff in countries must also appreciate that the current cohort of mothers in the Caribbean are young and have had little or no experience with vaccine-preventable diseases. Hence their fears and concerns are focused more on adverse events which may occur as a result of vaccination. Also, many health providers have never seen persons with vaccine-preventable diseases such as diphtheria, pertussis, and neonatal tetanus. On-going honest and open communication with the parents will help them to better understand the benefits of vaccination and alleviate their fears about vaccines. This is the most effective method of ensuring compliance with vaccination.

3. Measles and Rubella Elimination

Measles:

Confirmed measles cases in the Region of the Americas have decreased 99%, from 53,683 cases in 1997 to approximately 100 cases since 2003. The transmission of the D6 measles virus genotype which began in 1995 and caused large outbreaks in

Argentina, Bolivia, Brazil, the Dominican Republic and Haiti was interrupted in September 2001. The subsequent transmission of the D9 measles virus genotype in Venezuela was interrupted in November 2002 —14 months after it had started. The Venezuelan outbreak can be viewed as the last instance of widespread endemic transmission of the measles virus in the Americas.

The reported cases in 2003 and 2004 have been mostly linked directly or indirectly to importations of measles virus from other Regions of the world. An importation also initiated an outbreak of 108 measles cases in Mexico between April 2003 and April 2004. The high measles vaccine coverage in Mexico contributed to the containment of the outbreak. Nevertheless, 42% of municipalities in Latin America had a coverage rate of measles-containing vaccines <95% in 2004.

In Canada, epidemiological and virological evidence to date suggest that measles is not endemic and transmission in the general population has been interrupted. However, improving vaccine uptake in low-coverage religious communities in Canada remains a challenge. In 2000, a panel of experts concluded that indigenous measles transmission had been eliminated in the United States. However, importations continue to occur. In 2005, an import-related outbreak leading to 34 measles cases, three of them hospitalized with complications, occurred in Indiana. This was the largest measles outbreak in the United States since 1996. However, most of the cases were unvaccinated children of a church community and transmission was almost completely limited to a small sub-population. High vaccination coverage in the surrounding population helped contain most (but not all) of the outbreak to the vaccine-exemption group.

Despite the successes already achieved throughout the Region, important challenges remain. Measles is still endemic in other Regions, and sporadic cases continue to occur in the Region of the Americas because of importation. However, the experience in several countries shows that, when high coverage with measles-containing vaccine exists, reliable detection and aggressive follow-up of suspect cases will limit the consequences of measles virus importations.

Rubella and CRS Elimination:

In September 2003, PAHO's 44th Directing Council adopted Resolution CD44.R1 to eliminate rubella and congenital rubella syndrome by 2010 and urged member countries to prepare national plans of action in support of that objective. The elimination of rubella and CRS in the Americas has been defined as the successful interruption of endemic transmission of rubella in all the countries without the occurrence of CRS cases associated with endemic transmission.

As of November 2005, approximately 99% of new birth cohorts in the Region of the Americas have had access to the combination MMR. Only Haiti has yet to include the vaccine in its vaccination schedule. In 2002, all the countries of the Region conducted *follow-up* campaigns (second dose of vaccine for children aged <5 years) using the measles-rubella vaccine (MR), with over 90% coverage. From 1998 to October 2005, the English-speaking Caribbean, Costa Rica, Ecuador, El Salvador, Honduras, Nicaragua, and Paraguay conducted adult vaccination campaigns targeting men and women. Venezuela conducted the first stage of their campaign in June 2005, vaccinating persons

aged <16 years. Vaccination campaign in Colombia is ongoing. Campaigns in Brazil and Chile targeted only females. Coverage in campaigns in the Caribbean reached 80%, with the other countries achieving coverage rates of over 95%. The remaining countries in the Region plan to conduct vaccination campaigns between 2006 and 2007.

Since the introduction of the vaccine and the vaccination campaigns, rubella incidence has declined 97% –from 135,000 reported cases in 1998 to 3,103 cases in 2004. Up to 2005 (Week 41), only 1,980 cases have been reported. The number of countries/territories in the Americas that report suspect CRS cases increased from 18 (13%) in 1998 to all countries/territories (100%) in 2003. However, CRS surveillance is still incomplete and not all countries report weekly.

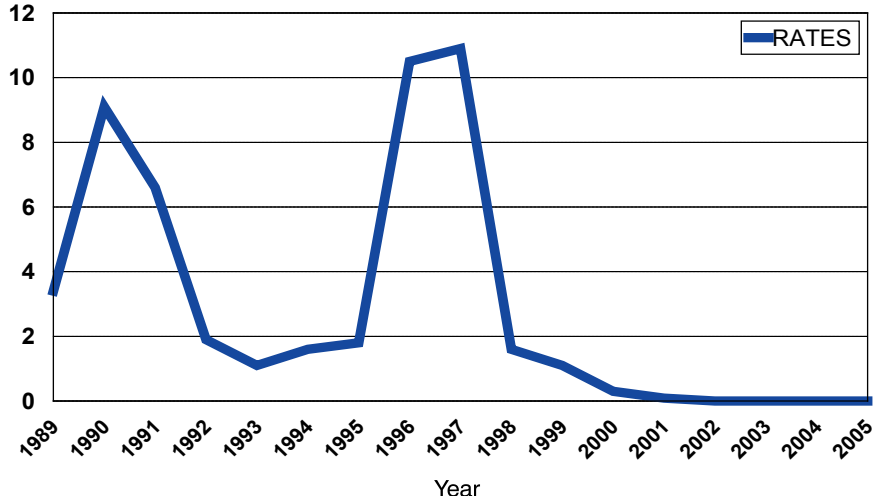
Canada has adopted the PAHO Regional goal to eliminate indigenously-transmitted rubella and CRS cases by 2010. Epidemiological evidence indicates that the indigenous transmission of rubella has been virtually eliminated and population immunity is high due to the success of various immunization programs. However, there are pockets of susceptible communities, which refuse immunization based on religious or philosophical reasons. In early 2005, a rubella outbreak occurred in Ontario with over 300 cases in a religious community refusing vaccination and with ties to a sister-community in the Netherlands, where an outbreak had been occurring. No CRS case associated with the outbreak has occurred to date.

In 2005, an expert committee unanimously declared that rubella and CRS have been eliminated in the United States. Elimination was defined as the absence of endemic rubella virus transmission in the U.S.

Impact of Rubella Vaccination Programme in the Caribbean:

The last rubella outbreak in the countries of the Caribbean community occurred from 1995 to 1998. In 1997, the incidence rate was 10.3 per 100,000 population, the highest since 1984 (Figure 2).

Figure 2. Incidence of Rubella Cases per 100,000 Population, English-speaking Caribbean and Suriname, 1989-2005*



Source: Ministries of Health Reports to CAREC

* Week 43

Since the implementation of the resolution of the Council for Human and Social Development for the Caribbean Community (1998), rubella cases have markedly decreased. No laboratory-confirmed rubella cases have occurred in the Caribbean since 2001. Prior to 2001, there were 70 rubella cases reported in 1999 (24 laboratory confirmed cases in the *Measles Elimination Surveillance System* – MESS); 21 cases in 2000; and 6 cases in 2001. No confirmed rubella cases have been reported from 2002 through 2005 (Week 43).

In 2005 (Week 43), 3 suspected CRS cases were referred for testing and 41 cases for TORCH studies. All were laboratory-investigated for rubella; all were negative. The last CRS case in the Caribbean was reported in 1999.

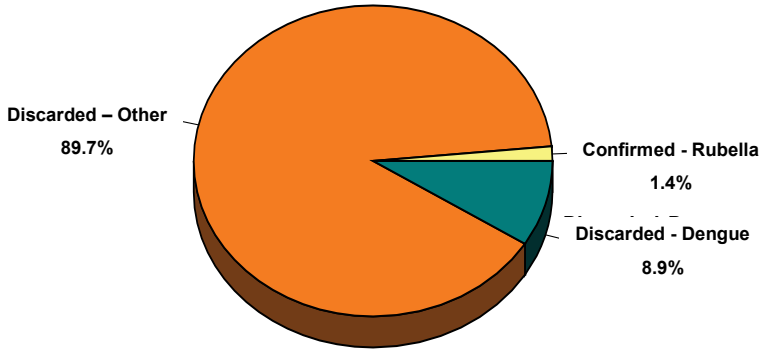
Measles and Rubella Surveillance:

In the Caribbean community, the last reported case of indigenous measles occurred in 1991 and the last importation, from a European tourist, in 1998. Surveillance remains critical, as it ensures that transmission has been interrupted. In order to achieve timely, complete, regular, and accurate information from surveillance system, countries are expected to report from both public and private sector sites. There are about 735 reporting sites in the countries in 2005 and 99% of all reporting sites within countries have reported weekly.

The percentage of samples reaching the laboratory in less than 5 days has remained less than 50%. For example, in 2000 only 35% of the specimens arrived at the regional laboratory in less than 5 days; in 2001, it was 15%; in 2003, 23%; and in 2004, 29%. For 2005 (Week 43), 31% of specimens arrived at the regional laboratory within 5 days of collection.

Laboratory testing was conducted in 98.5% of the 6,056 suspect cases reported between 1991-2004. Between 2000-2004, 1,678 suspect cases were reported. Of these, 27 were laboratory-confirmed as rubella and 166 as dengue. Laboratory testing was conducted in 99% of the 1,856 cases reported between 2000-2005 (Week 43). Of those tested by laboratory, none was confirmed as measles, 27 were confirmed as rubella, 173 were confirmed as dengue, and 1,656 were neither measles, rubella, or dengue (Figure 3).

Figure 3. Classification of Suspected Measles Cases, English-speaking Caribbean and Suriname, 2000-2004



Source: Ministries of Health Reports to CAREC

Four cases are still being investigated. Of the cases that are neither measles/rubella nor dengue, some were laboratory confirmed as human herpes virus type 6 (HHV-6) and some had clinical diagnosis such as scarlet fever and allergic reaction.

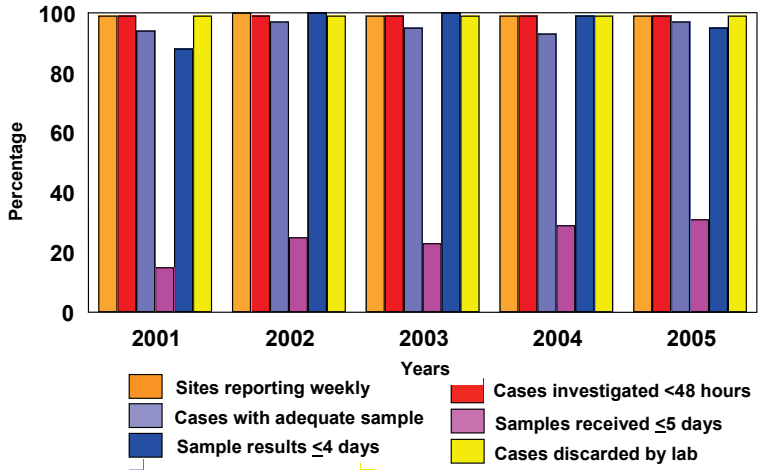
For 2005 (Week 43), 178 suspect cases were reported. Seven cases were laboratory-confirmed as dengue and 171 cases were discarded as neither measles, rubella, or dengue. Four cases are still being investigated. There were no laboratory-confirmed cases of rubella or measles in 2005. In addition to these 178 cases, French Guiana reported 95 fever-rash cases, of which 36 were laboratory-confirmed as dengue and the rest tested negative for measles and rubella. Of the fever-rash cases that were reported, 66% were aged <5 years, 26% were aged 5-19 years, and 8% were aged >20 years. Ninety-one specimens from cases aged <5 years, whose test results were neither measles nor rubella, were tested for HHV-6; 24 (26%) tested IgM-positive for HHV-6.

Surveillance Indicators:

Countries are expected to report surveillance data on a weekly basis from both public and private sector sites. French Guiana has been included in the MESS weekly reporting system since 2003 and continues to report in 2005. For 2004, 99% of sites reported weekly. There are about 735 reporting sites in the countries in 2005 (Week 43) and 99% of all reporting sites within countries have reported weekly.

In 2004, 99% of suspect cases reported were investigated within 48 hours, 93% had adequate samples taken, and 99% received laboratory results in less than 4 days. The percentage of specimens discarded by laboratory testing was 99%. Only 29% of samples arrived at the CAREC laboratory within 4 days of blood collection.
For 2005 (Week 43), 99% of sites reported weekly and 99% of cases were investigated within 48 hours; 97% of cases had adequate samples taken, and 95% received laboratory results in less than 4 days. The percentage of specimens discarded by laboratory testing was 99%. Only 31% of samples arrived at the CAREC laboratory within 4 days of blood collection (Figure 4)

Figure 4. Status of Indicators of Measles* Surveillance, English-speaking Caribbean and Suriname, 2001-2005**

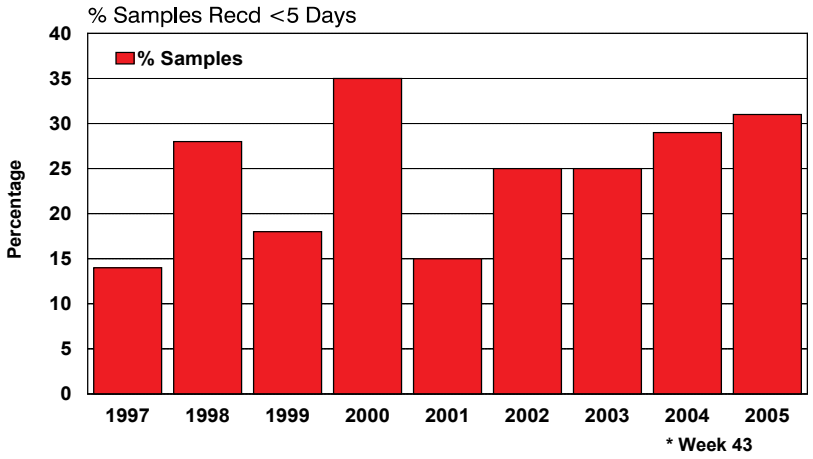


Source: Ministries of Health Reports to CAREC

* Indicators are for measles/rubella in 2005
** Week 43

The percentage of samples reaching the laboratory in less than five days has remained <50%. For example, in 2000, only 35% of the specimens arrived at the regional laboratory in less than 5 days; in 2001, it was 15%, in 2003 it was 23%, and in 2004 it was 29%. For 2005 (Week 43), 31% of specimens arrive at the regional laboratory within 5 days of blood collection (Figure 5).

Figure 5. Percentage of Samples Received in CAREC Laboratory <5 Days After Being Taken, English-speaking Caribbean and Suriname,1997-2005*



Source: Ministries of Health Reports to the Measles Elimination Surveillance System (MESS) /CAREC

For three countries, Belize, St. Kitts & Nevis, and Trinidad & Tobago, over 50% of their samples have arrived at the CAREC laboratory less than five days after being taken. Every effort is still being made to encourage countries to ship specimens to the CAREC laboratory as quickly as possible and have an in-country mechanism for specimen transportation.

Barbados, Belize, Guyana, and Saint Kitts & Nevis presented their specific surveillance activities. Actions proposed to improve measles/rubella surveillance in these countries include further training in surveillance for private sector doctors and recent graduates, strengthening notification of suspect cases, active case-searches, and timely transportation of appropriate specimens.

Integrated Surveillance Information System for Vaccine-Preventable Diseases (ISIS) and CRS database software:

PAHO's Immunization Unit is developing a new integrated surveillance information system (ISIS) for vaccine-preventable diseases and the management of other aspects of an immunization program. In the first stage, ISIS will replace MESS and PESS. Noteworthy features of ISIS include a built-in geographical information system (GIS) and the availability of 3 products for one database system: a stand-alone system based on .NET framework (Phase I), a data exchange bridge (Phase II), and a Web-based system (Phase III).

Software for CRS surveillance has been released by PAHO in 2005. This application allows collecting case investigation data about CRS-suspect infants, viewing and printing case listing, and producing analytical reports with the main indicators suggested by the

TAG. The system facilitates data transmission between all geographic levels, and allows exporting data to other software for further statistical analysis.

Recommendations

The data presented highlight the need to rapidly implement the recommendations of the 2004 PAHO TAG on measles and rubella.

Specific measles recommendations:

- Countries should maintain high coverage rate (≥95%) with measles-containing vaccines in all municipalities. In particular, supplemental immunization activities should target low-coverage municipalities as well as underserved or hard-to-reach population groups.
- Countries should endorse the definitions of elimination, re-establishment of endemic transmission, and of imported/import-related cases recommended by the *ad-hoc* meeting of experts held in Washington, D.C. in March 2004, cited in the PAHO EPI Newsletter of April 2004 (Annex 1).

Specific rubella and CRS recommendations:

- In the context of elimination, high quality CRS surveillance requires an active component and a sensitive case definition (Annex 1).
- During elimination, all suspect CRS cases should have specimens collected for IgM testing and virus isolation.
- All countries will need to ensure that strategies are in place to detect and vaccinate those still requiring vaccination. These strategies may include: (1) reminding all health staff about measles and rubella elimination and ensuring that screening tools are in place to detect those that are not vaccinated (men and women); and (2) prenatal screening of women (asking for proof of vaccination) and vaccinating the unvaccinated post-delivery.
- To harmonize practices among PAHO-reporting countries, all countries should incorporate the rubella/CRS suggestions and definitions based on the deliberations of the *ad-hoc* meeting of experts referred to above.
- With regards to documenting the interruption of endemic transmission, the following aspects need to be considered:

    1. Evolution and development of the immunization program;
    2. Routine vaccination coverage since the introduction of rubella-containing vaccines and results of *follow-up* campaigns using MR vaccine and “once-and-for-all” campaign;
    3. Impact of vaccination in the epidemiology of rubella and CRS;
    4. Achievement of surveillance indicators;
    5. Results of active case searches for rubella and CRS;
    6. Viral detection and viral isolation results;
    7. Seroprevalence studies, if granted;

8. Documentation of trends in congenital deafness and cataracts, as a proxy for CRS; and
9. Set-up of national and Regional committees to review the available data and the steps for certification of rubella elimination.

Measles/rubella surveillance recommendations:

- For elimination purposes, full integration of measles and rubella surveillance, including integrated laboratories, is required, with an emphasis on active surveillance. Except for outbreak settings, all specimens will be tested for both measles and rubella.

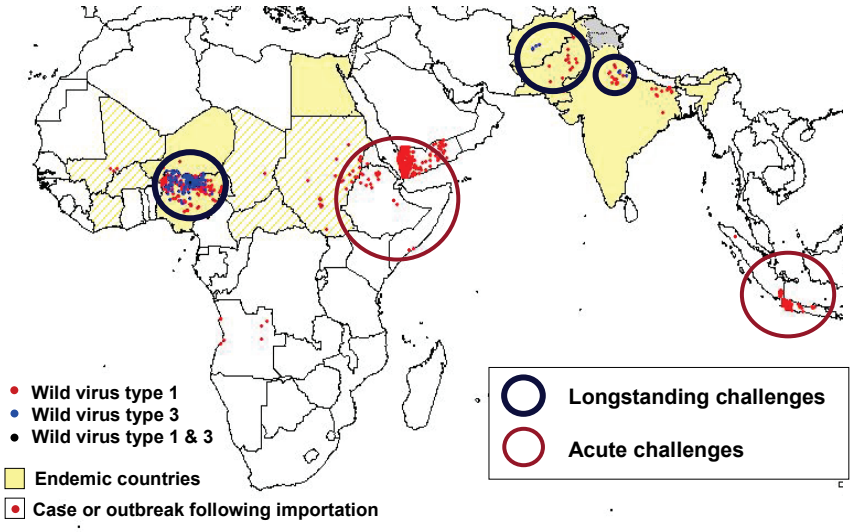
- Countries should stress the importance of the main EPI indicators that are currently reported in the PAHO Measles/Rubella Weekly Bulletin. Three indicators are critical: the proportion of suspected cases with adequate investigation,[1] the proportion of suspected cases with a timely blood sample, and the proportion of transmission chains with representative samples for virus isolation.

- Countries should make every effort to get their specimens to CAREC within 4 days. To this end, communication between EPI managers and laboratories is critical.

4. Polio Eradication

As of September 2005, wild poliovirus circulation is occurring in 18 countries, 6 of which have endemic circulation (Figure 6). Recent outbreaks in previously polio-free countries have highlighted that countries with pockets of susceptibles are at risk of wild-poliovirus reintroduction and vaccine-derived polio circulation.

Figure 6. Poliomyelitis Cases and Priorities, September 2005



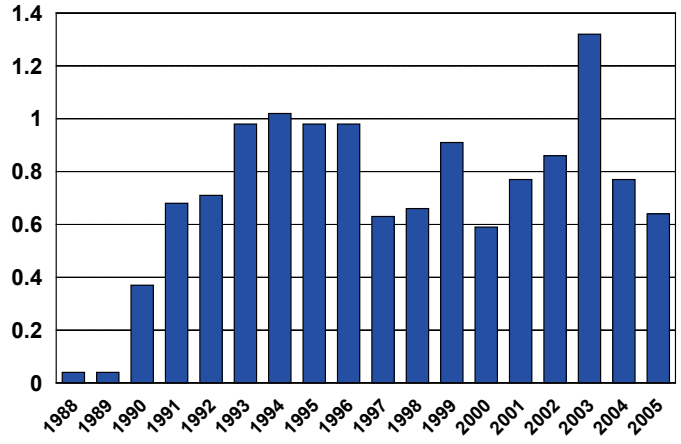
[1] An adequate case investigation includes a home visit within 48 hours of notification, completeness of relevant data (i.e., date of notification, date of investigation, date of rash onset, date sample taken, type of rash, presence of fever, dates of previous measles/rubella vaccinations), and active case-searches.

In the Western Hemisphere, the eradication of polio was achieved in 1991 and the Region was certified as free of the circulation of the indigenous wild poliovirus in 1994. The last case of poliomyelitis in the countries of the Caribbean Community was in 1982. After fourteen years of maintaining the Americas polio-free, the Region continues to sustain an adequate level of acute flaccid paralysis surveillance and has taken steps aimed at achieving high coverage in every district, as well as avoiding importations and the circulation of Sabin vaccine-derived viruses in its territory. The Regional AFP rate continues to be above 1/100,000 in children aged <15 years and the proportion of adequate specimens continues to be 80%. However, we should not be complacent as several individual countries are not achieving these indicators and the risk of importations is real.

In September 2005, poliovirus type 1 was identified in an immunocompromised 7-month-old infant in the United States. The infant had not been vaccinated and was part of an Amish community in Minnesota, mostly unvaccinated for polio. The isolate was determined to be vaccine-derived poliovirus 2.3% divergent from Sabin type 1 strain, which is consistent with an extensive period of virus excretion or transmission. The patient's family had not received OPV and OPV is no longer used in the United States since 2000. Poliovirus infection (asymptomatic) was confirmed in other 3 children in that community. None of the children had paralysis and no polio cases have been identified. Investigation is ongoing. Previously, a Sabin-derived poliovirus had been isolated in an immunodeficient child in Peru in 2003.

The strategies for eradication have to be sustained, namely, an effective and timely AFP surveillance and attaining and maintaining vaccination coverage >95% for polio vaccines for each birth cohort. In the Caribbean community, there are 505 AFP surveillance reporting sites. Ninety-nine percent of the sites have reported weekly in 2005 (Week 43). Between 1994 and 2004, 206 AFP cases (aged <15 years) were reported from over ten countries. In 2005 (Week 43), there were 0.64 AFP cases reported per 100,000 children aged <15 years, down from 0.77 in 2004 and 1.32 in 2003 (Figure 7).

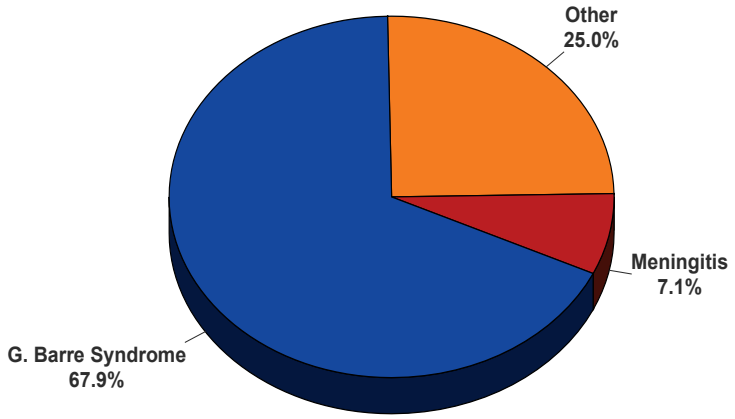
Figure 7. Annual Rate of Acute Flaccid Cases per 100,000 <15 years, English-speaking Caribbean and Suriname, 1988-2005*



Source: Ministries of Health Reports to CAREC *** Week 43**

In 2004, 28 cases with age range 12 months to 62 years were reported. Stool samples were submitted for 25 (89%) of the cases. Stool sample for 1 case (<15 years) from Jamaica, was sent to the laboratory of the University of the West Indies instead of that of CAREC. Fifteen (53%) of the 28 cases were aged <15 years and were reported from Belize, Guyana, Jamaica, St. Vincent & the Grenadines, Suriname, and Trinidad & Tobago. Belize, Guyana, and Suriname met all 4 surveillance criteria. Of the cases aged <15 years, 87% were investigated within 48 hours. Stool samples were submitted for all 15 cases aged <15 years. Over 85% of the AFP cases were diagnosed as Guillain-Barré Syndrome (GBS). Other diagnoses were tumors and meningitis (Figure 8).

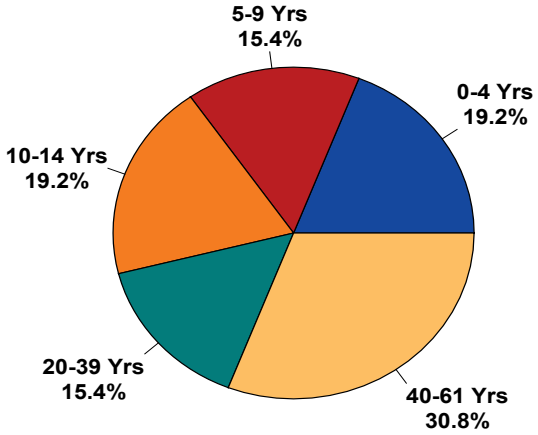
Figure 8. Reported Diagnosis of Acute Flaccid Paralysis Cases, English-speaking Caribbean and Suriname, 2004



Source: Ministries of Health Reports to CAREC

In 2005 (Week 43), 26 cases with ages ranging from 11 months to 61 years were reported (Figure 9).

Figure 9. Age Distribution of Acute Flaccid Paralysis Cases, English-speaking Caribbean and Suriname, 2005*



Source: Ministries of Health Reports to CAREC *** Week 43**

Fifty-four percent of the cases were aged <15 years of age and were reported from Bahamas, Belize, Guyana, Jamaica, Suriname, and Trinidad & Tobago. Ninety-six percent of the cases were investigated within 48 hours. Stool samples were submitted for 20 (77%) of the cases. However, for all cases aged <15 years stool samples were submitted. Over 50% of all specimens were taken within 10 days of paralysis. Bahamas, Belize, Guyana, and Suriname met all 4 surveillance criteria. Jamaica and Trinidad & Tobago met 3 of the 4 surveillance criteria (Annex 2).

Validation:

For the validation of the AFP surveillance system, hospital logs were reviewed in 2005 in Aruba, Netherlands Antilles, and St. Lucia. The findings of the review in the islands correlated well with the reported surveillance information; no AFP case (aged <15 years) was found. AFP validation is expected to be conducted in at least 3 other countries before the end of 2005.

Polio Containment:

The Caribbean sub-region is still conducting a survey of all biomedical laboratories to identify those with wild poliovirus infectious materials and potential wild poliovirus-containing material. The new survey instrument for the laboratories was developed and already disseminated to the countries. In some countries all of the laboratories have already been visited. The completed forms are expected to be returned by the end of November. All countries need to have a listing of their laboratories and the tests they offer. Laboratories with -20^{o}C capabilities need to be checked for potential wild poliovirus-containing material.

Issues Regarding Polio Vaccines:

PAHO recommends the use of the oral polio vaccine. OPV provides intestinal immunity, is easy to administer, protects contacts in the family and community, thereby conferring herd immunity, and is substantially less expensive than the inactivated polio vaccine. OPV-associated risks include vaccine-associated paralytic poliomyelitis (VAPP), with an incidence of 1 in 2.4 million doses, and circulation of vaccine-derived poliovirus (VDPV). Countries thinking about IPV introduction should consider disease burden, perception of risk, and opportunity costs, especially in relation to introducing other vaccines, such as influenza, pneumococcus, rotavirus, and HPV.

Recommendations

- Countries must maintain adequate AFP surveillance, guarantee high OPV coverage in every municipality and comply with the Plan of Action for Containment of Wild Poliovirus in the Laboratories.

- Until the world is certified as polio-free, OPV remains the vaccine of choice for the final phase of the global eradication of polio. The countries of the Caribbean should

continue to use OPV in the routine program to maximize population immunity until global polio eradication is achieved.

- The Region should advance in the post certification period in close accordance with the global policies stated by the Global Certification Commission on Polio Eradication.

- Validation of the surveillance is essential in all countries and this should be part of the ongoing monitoring and evaluation of the EPI.

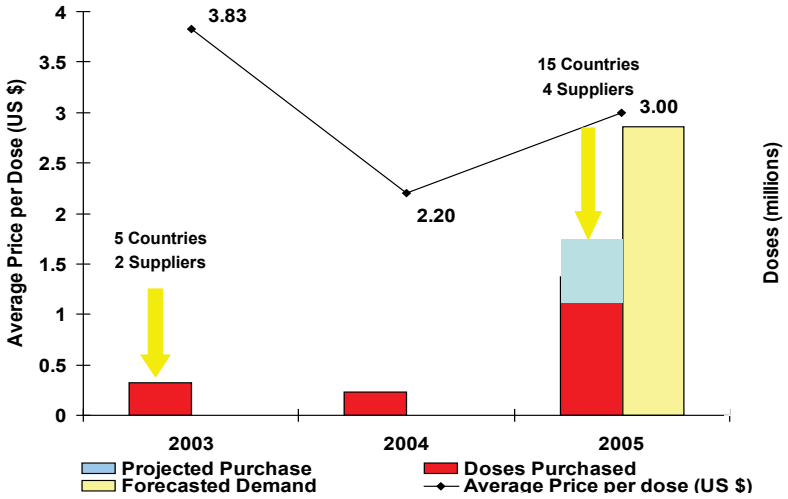
5. Seasonal Influenza Vaccination

The cost-effectiveness of seasonal influenza vaccination targeting high-risk groups has been well-documented. Recently Costa Rica conducted a study validating this approach[2] (EPI Newsletter, June 2004.) To that end, the PAHO TAG in their last meeting in 2004 recommended that countries in the Americas implement seasonal influenza vaccination for:

- Populations aged ≥60 years;
- Chronically-ill individuals;
- Immunodeficient populations;
- Health professionals; and
- Pregnant women.

To date, more than 20 countries in the Americas are conducting seasonal influenza vaccination targeting high-risk groups. Most of the progress can be attributed to the acceleration of strategies in the last few years. In 2003, five countries using two suppliers purchased seasonal influenza vaccine through the PAHO Revolving Fund. By 2005, 15 countries using 4 suppliers were purchasing this vaccine through the Revolving Fund. Over this time period, the price per dose dropped from US $3.83 in 2003 to $3.00 in 2005. The greatest challenge is sustaining the supply to meet the demand (Figure 10).

Figure 10. Seasonal Influenza: Supply Lagging Demand, 2003-2005



Source: EPI Revolving Fund

[2] See PAHO Immunization Newsletter, Vol.XXVI, Number 3, April 2004.

The lessons learned with seasonal influenza vaccination are:

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

The priority given to seasonal influenza vaccination at the 2004 TAG will be maintained in the next TAG and Interagency Coordination Committee (ICC) meetings in Guatemala in July 2006.

Within the Caribbean community, seasonal influenza vaccine is now available inexpensively through the PAHO Revolving Fund in both pediatric and adult formulations. Six countries –Anguilla, Aruba, Bahamas, Bermuda, Cayman Islands, and Netherlands Antilles– include seasonal influenza vaccine in their routine vaccine schedule, and three others –Grenada, Trinidad & Tobago, and Turks & Caicos Islands– will make this same addition in 2005-2006. Target populations include persons aged >60 years, children aged 6-23 months, and other high-risk individuals and occupations. The remaining countries of the Caribbean are still assessing the costs and benefits of introducing the vaccine, identifying the target population, and considering what amount of vaccine, if any, to order through the Revolving Fund. Within these countries, the vaccine is only available through the private sector.

Recommendations

- Countries are encouraged to study the burden of influenza on their populations and, where justified, add seasonal influenza vaccination to their routine immunization schedule.

- Countries already using seasonal influenza vaccine are encouraged to study the effect of the vaccine on morbidity and mortality.

- Target populations should include, at a minimum, persons aged >60 years, individuals with chronic illnesses, immunocompromised individuals, health professionals, and pregnant women. PAHO also encourages countries to consider targeting children aged 6-23 months.

6. Influenza Pandemic Preparedness

All countries have already received WHO, PAHO, and CAREC guidelines on developing plans for influenza pandemic preparedness, as well as sample plans from countries such as the UK and Canada. A draft simulation exercise in relation to SARS (Severe Acute Respiratory Syndrome) was disseminated to the countries in 2003. This draft simulation exercise has been reviewed and amended to be used for influenza pandemic preparedness.

The activities that are recommended in preparation of a national plan are:

- Creation of a planning group;
- Development of a plan;
- Surveillance in birds and humans;
- Planning for emergency activities;
- Prevention of introduction & spread of disease; and
- Management, including treatment of patients.

Another pandemic is inevitable, possibly with H5N1, which is "new" to humans. Thus, during the pre-pandemic phase the emphasis for surveillance should be in both birds and humans. During a pandemic, vaccines and antivirals will probably NOT play a major role in the initial response. Public health measures, including hand-washing, limiting gatherings, and quarantine, will form the major part of community control measures. Hospital infection control will also be crucial in controlling the pandemic.

The member countries of the Caribbean community are taking the threat seriously and making the necessary plans. Currently, 17 of 21 countries have held at least one planning committee meeting and have a draft plan or outline of a plan. The committees are multidisciplinary and multileveled, and in most countries represent national surveillance and response teams. The next steps will include further preparation activities such as confirmation of laboratory networks in the region, finalization of country plans, hosting of a regional meeting, training and conducting simulation exercises.

Five countries namely Barbados, Bermuda, Dominica, Jamaica, and Trinidad & Tobago presented the status of their influenza pandemic preparedness plans (IPPPs). All countries have initiated planning.

Barbados formed a national multi-sectoral committee comprising persons from both the government and private sectors. A meeting has been held to sensitize all the stakeholders and to bring everyone up to date on the problem. The committee in charge within the Ministry of Health decided to develop a plan with four basic components: surveillance, care and treatment, public awareness and promotion, vaccination and use of anti-viral. Draft plans have been completed for the surveillance, vaccination, and use of antiviral sections. The plan on vaccination and antiviral use has recommended that 3 small sub-committee be established, with specific terms of reference, to plan the logistics and procurement of vaccines and antiviral medication, to plan for social mobilization for a campaign, and provide surveillance and evaluation of any such campaign. The list of activities to be accomplished along with expected completion dates and the estimated budget has also been developed.

In Dominica, the development of the health component of the National Plan for Influenza Pandemic began in November 2005. Key issues in completing the plan include a decision on which agency is to coordinate the completion and implementation of the national plan (health and agriculture currently developing components of the plan) and the acquisition of resources (e.g. PPE, influenza vaccine -seasonal and pandemic antivirals) necessary for implementation of the plan. It is anticipated that the plan will be completed by the end of the second quarter of 2006.

The Pandemic Influenza Committee of Bermuda has been approved by Cabinet and a draft plan has been developed. Weekly reporting surveillance system is already in place for influenza and this will be further upgraded and strengthened as necessary. There is already adequate laboratory capacity for diagnosis. As part of the preparedness activities, a special health educational campaign has been launched - "*Cover Your Cough*". This is a joint campaign with the hospitals, physicians, day-care facilities and schools.

A joint IPPP is being prepared by the Ministry of Health and the Ministry of Agriculture of Jamaica. Both Ministries have established planning committees and WHO recommendations were utilized in establishing subgroups: planning and coordination; human and animal surveillance; port health and surveillance; health systems response including prevention and containment; and communications. There has been sensitization of some key stakeholders at the regional, national, and parish levels in both Ministries. The present surveillance system is being reviewed and strengthened to better monitor morbidity, and mortality of influenza disease. The laboratory plans include increasing laboratory capacity for virologic surveillance, isolation and culture of the organism, and implementing biosafety lab level 3. A policy for seasonal immunization is being considered. The Ministry of Agriculture has submitted plans for surveillance of commercial, non-commercial poultry, individual farms and for management of outbreak. The draft IPPP is to be completed in December 2005 and will be submitted to the Cabinet.

Trinidad &Tobago H5N1 Preparedness Plan was initiated in May 2005 and a Task Force Committee was established in June 2005. The Committee is comprised of members from the Ministry of Health, Ministry of Agriculture, health institutions, primary health care staff, Trinidad Public Health Laboratory, CAREC, and the Office of the Disaster Management (NEMA).

The Terms of Reference for the Task Force are:

1. To develop an Influenza (H5N1) Pandemic Preparedness and Response Plan. Draft Plan completed on 15 November 2005. Status - Electronic copies distributed for review and comments.
2. Heightened surveillance in port health, hospitals, community health services NSU implemented enhanced surveillance in the above areas and data being collected.
3. Strengthen lab capacity to facilitate throat swab analysis from sentinel areas identified. Status – specimens being collected for testing.
4. Sensitization of health workers – All regional health areas sensitized and workshops conducted by MOH and NSU.
5. Procurement of Antiviral and Vaccinations. Status – orders placed for procurement.
6. Procurement of protective gear – Masks, gowns, gloves, and goggles – stocks available at C40 (from SARS programme).
7. Port health surveillance heightened both for animals/birds and travellers from endemic areas.
8. Communication: Full page messages published in daily newspapers. Handouts being prepared – soon for distribution.
9. Ongoing sensitization workshops/training in progress.
10. Identification of high risk groups. Status – completed.

11. Identify areas for quarantine/isolation/management/treatment. Status – Institutions and community health services notified.

Finally, the participants of the 22nd EPI managers meeting unanimously endorsed the activities outlined in the document "*PAHO Strategic and Operational Plan for responding to Pandemic Influenza*" and specifically those in section 3 of the plan entitled "*Support countries in making available pandemic vaccines and antiviral drugs*". The participants requested PAHO to provide guidelines on the prioritization of target groups for pandemic influenza vaccination.

Recommendation

- Countries are urged to develop national influenza pandemic preparedness plans, in accordance with WHO guidelines.

7. New Vaccines

Rotavirus:

Rotavirus (RV) infections are responsible for about one-third of the infantile gastroenteritis burden in developed as well as in developing countries worldwide. It has been estimated that every year 24 million medical consultations and 2.3 million hospitalizations result from the 114 million new diarrhea episodes caused by RV infections. In Latin America, 17,000 deaths due to RV gastroenteritis occur among children annually.

Two RV vaccines, one monovalent and one polyvalent, have undergone extensive testing for efficacy and safety in a number of clinical trials. The monovalent RV vaccine derived from a single strain of human rotavirus, serotype G1, has been found to be 85% efficacious against severe RV gastroenteritis [Vesikari =>11]; 100% efficacious against very severe RV gastroenteritis [Vesikari=>19]; and 86% efficacious against hospitalized RV gastroenteritis. Additionally, it has been noted that this vaccine would generate a 42% reduction in hospitalizations for severe gastroenteritis in general. Both RV vaccines have been deemed safe, and neither was associated with an increased risk of intussusception in the over 60,000 subjects tested in the safety trials. As of September 2005, the monovalent vaccine has been licensed in 12 countries in Latin America and the Caribbean.

PAHO, in collaboration with Member States, has been designing and developing surveillance systems for rotavirus gastroenteritis, and to date such systems are being piloted in five Latin American and four Caribbean countries. The purpose of this surveillance system is to generate relevant data for constructing an epidemiologic profile on rotavirus infections and for monitoring impact following vaccine introduction. Standardized case definitions (Annex 4), information and data flow pathways, and laboratory assays have been developed as part of this surveillance process. In this system, sentinel hospitals constitute the focal unit for surveillance of RV gastroenteritis. Based on data generated from the RV surveillance system for the first six months of 2005, 77.7 percent of hospitalized children aged <five years were classified as suspect cases of rotavirus gastroenteritis with 37.9 percent of these being laboratory-confirmed.

Within the four Caribbean surveillance sites in Guyana, St. Vincent & the Grenadines, Suriname, and Trinidad & Tobago, the proportion of stool specimens found to be positive for RV ranges from 25% to 56%.

Recent experience with the collection of samples in disposable diapers has greatly increased the proportion of children providing specimens, and RV recovery rates from these diapers have been similar to those for traditional stool specimens.

PAHO will continue to work closely with Member States to expand the RV surveillance base, to establish a supporting laboratory network, and to publish a field guide for RV diarrhoeal disease surveillance in Latin America and the Caribbean.

Recommendations

- National EPI managers, in collaboration with national epidemiologists and Laboratory Directors, should review the existing RV surveillance protocols and adapt them as appropriate to local settings, while ensuring the application of standardized case definitions, so that the quality and integrity of the information is assured for making valid inter-country and inter-regional comparisons;

- Where the proportion of patients providing specimens is unacceptably low, countries should consider using disposable diapers to collect these specimens.

Human Papillomavirus:

HPVs are small, epitheliotropic DNA viruses, which have been confirmed as the causative agents of cervical cancer. On the basis of molecular biological and epidemiological studies, HPV types which infect the genital epithelium have been classified as having high and low risk oncogenic potential. High risk HPV types such as 16 and 18 are most frequently associated with invasive cervical cancer, while the low risk types such as 6 and 11 are associated with the development of genital warts.

From a public health perspective, cervical cancer is the most important sequel of an HPV infection. However, the global HPV burden not only includes the 500,000 new cases of cervical cancer, which occur every year, but also the entire pathologic spectrum of pre-cancerous lesions consisting of 10 million cases of high risk dysplasias; 30 million cases of low grade dysplasias; and 300 million new HPV infections without cytological abnormalities. Every year over 233,000 women die from cervical cancer worldwide. In the Region of the Americas, where over 92,000 cases and 33,000 deaths of cervical cancer are recorded annually, significant sub-regional disparities exist, as incidence and mortality rates in Latin America and the Caribbean are 4-5 times higher than those for North America. Age-adjusted incidence and mortality rates for cervical cancer in the Caribbean have been estimated at 35.8 and 16.8 per 100,000 population, respectively, by the International Agency for Research on Cancer.

Two prophylactic HPV vaccines composed of sub-unit virus-like particles (VLPs) have undergone extensive clinical trials in human subjects with excellent results. The tetravalent (16, 18, 6, 11) and bivalent (16, 18) HPV vaccines, which have been tested to

date, have been found to be 100 percent efficacious in preventing both persistent infection as well as cervical intraepithelial neoplasia in vaccinated subjects. These vaccines have elicited significant antibody as well as robust cell mediated immune responses at levels higher than those observed in naturally acquired infections. Both vaccines have been well tolerated in subjects. The tetravalent vaccine will be available during mid-2006.

HPV prophylactic vaccines will provide a significant opportunity for enhanced comprehensive cervical cancer prevention through the dual application of these primary preventive tools together with secondary prevention through screening.

In order to assemble the evidence to support rational and effective decision-making for HPV vaccine introduction, studies on the economic impact of cervical cancer, the cost-effectiveness of vaccination, and the acceptability of vaccination by health care providers and the general population will be required.

Recommendations

At this time, it is recommended that National EPI managers:

- Initiate dialogue with relevant stakeholders such as technical professionals responsible for cervical cancer prevention and control in the Ministry of Health, gynecologists, and others around the topic of cervical cancer prevention through vaccination.

- Begin to gather data on the magnitude of the cervical cancer burden in their individual countries.

8. Vaccination Week in the Americas

At the PAHO's Directing Council in September 2003, the Ministers of Health adopted Resolution CD44.R1 on Sustaining Immunization Programs that 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 2005, 36 countries participated in the VWA, 12 of them focusing on communication and awareness campaigns. Over 37 million persons were vaccinated,

according to the following age groups: 16.5 million children aged <5 years, 13 million adults aged >60 years, and 2.2 million women of childbearing age. In five countries, 48,774 children aged 1-4 years were vaccinated for the first time. In five countries, 539,825 WCBAs vaccinated with dT had not received a previous doses. Brazil vaccinated more than 13 million adults aged >60 years with influenza vaccine. Guatemala introduced pentavalent vaccine for children <1 year. Paraguay vaccinated 3.5 million people aged 5-39 years as part of its rubella and CRS elimination strategy. Peru vaccinated approximately 700,000 people aged >2 years against yellow fever. Bolivia, Ecuador, and Nicaragua continued their VWA efforts despite numerous challenges.

During VWA, Barbados conducted an investigation of EPI practices in the private sector. The objectives of this investigation were to better understand standards for vaccine storage, handling, and sources in the private sector. The Bahamas implemented activities to improve the national immunization coverage in all target groups and to ensure that the adult population received the required vaccines. Supervisory/EPI audit sessions were held, along with door-to-door visits and vaccination of defaulters. Healthcare providers and NGO partnerships were enhanced and the national immunization coverage of vulnerable groups improved. St. Kitts & Nevis focused its activities on social mobilization, live panel discussion aired on radio and TV, health education sessions in primary and secondary schools, health education sessions to parents, distribution of leaflets developed locally, and hepatitis B vaccination campaign for health care providers not previously immunized. Suriname used the VWA to implement a MMR *follow-up* campaign targeting all children in the age group 12-60 months regardless of vaccination status. Status of all antigens in the age group 3-60 months was also checked, and vaccination were administered as needed. The activities resulted in a coverage of 92% in the coastal areas. The coverage achieved in the hinterland was 83%. A mop-up campaign was done in the interior.

Goals and strategies for the 2006 VWA in Caribbean countries can be found in Annex 3.

Recommendations

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

- Target interventions in population groups traditionally underserved during routine activities.

- Determine the VWA contributions reaching children with 0 doses, documenting the inequity-reduction through operational evaluations.

- The VWA is an opportunity to strengthen interagency and intersectorial cooperation. Likewise, border coordination has been successful and must be given a priority within the plan.

- Guarantee the sustainability of the VWA within the EPI Plans of action.

- Guarantee the necessary human resources and logistical support, as well as the permanent monitoring of activities.

- Use the VWA as a platform to support rubella and CRS elimination in the Region.

- Report achievements and indicators to evaluate the attainment of goals at the Regional level.

9. EPI Evaluations

In 2005, PAHO together with the Ministries of Health conducted external reviews of the EPI programs in Aruba, St. Lucia, and the five islands of the Netherland Antilles: Bonaire, Curaçao, Saba, St. Eustatius, and St. Maarten. The main objectives of the EPI reviews were to:

- 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;
- Define strengths, weaknesses, and factors that facilitate and hinder the achievement of objectives of the program;
- Use the data gathered for timely decision-making and development of a five-year plan of action aimed at strengthening the program; and
- Determine user satisfaction.

Vaccination coverage rates have consistently been greater than 90% in Aruba, the Netherlands Antilles, and St. Lucia. EPI is given high priority by the government and at all levels of the health system. The health providers in both the public and private sectors are dedicated to achieving the goals and objectives of the program. Governments have demonstrated their commitment by the provision of vaccines. Although vaccination coverage and surveillance data are not routinely being received from Aruba and the Netherlands Antilles, they were noted to have high vaccination coverage (>90%) and the information was easily retrievable in the islands.

All islands adhered to good vaccination practices. Good community participation and client satisfaction was noted. The need for strengthening of the surveillance system was evident for all the islands. A simple validation of the surveillance system was done and no cases of vaccine-preventable diseases were identified.

Most of the islands have already implemented some of the recommendations in the evaluation report. Challenges for the program include attaining and maintaining vaccination coverage for all antigens at 95% or greater, strengthening of the surveillance system, ensuring that the training needs are met, and maintaining good supervision.

Recommendations

- PAHO should continue to conduct national EPI evaluations in the Region and promote the use of the results as a tool to elaborate annual EPI Plans of Action, as

well as to strengthen strategic alliances. Also, repeated national EPI evaluations should be used as an instrument to evaluate progress over time.

- The TAG recommends refining the performance criteria for political commitment in view of regional progress. Political commitment cannot be assessed solely by the presence of a vaccine law and/or national budget line item for vaccines in the country. Staffing levels and the amount of resources assigned to logistical support should also be considered.

10. Immunization Safety

Monitoring ESAVIs:

There were no report of anaphylactic reaction and a few serious events associated with vaccinations were reported. One event was the death of an infant within 96 hours of vaccination with MMR. On post-mortem, the cause of death was attributed to aspiration pneumonia, i.e., not related to vaccination.

Thimerosal and Vaccines:

In Belize, media reports questioning the safety of thimerosal-containing vaccines were published in 2005. Thimerosal is a mercury-containing preservative used in several vaccines to prevent bacterial and fungal contamination. The data available have been reviewed by different groups of experts, and the groups have concluded that there is no association between thimerosal and autism.[3]

Recommendations

- For all reported ESAVIs, clear and careful documentation and investigation is critical.

- Countries should conduct efforts to ensure that health professional and the public are well informed regarding vaccine safety issues. Transparency and the provision of updated scientific evidence are essential. Working with the media is essential for avoiding misinformation that can jeopardize immunization programs.

11. Program Management

Managers were requested to address the unfinished business of improving immunization coverage in low-performing districts while introducing underutilized vaccines, including seasonal influenza and yellow fever, and new vaccines (where epidemiologically indicated) into routine schedules. The presentations highlighted the increasing cost of the basic bundle of vaccines against major childhood diseases, currently averaging around US $15.50 per fully-immunized child. The impact of adding new and underutilized vaccines to the basic cost would more than double the current

3 See PAHO Immunization Newsletter, Vol.XXVII, Number 5, October 2005.

average, with one scenario costing the addition of pediatric influenza, yellow fever (where indicated) and rotavirus vaccines at almost $18.00, resulting in a cost per fully immunized child of approximately $33.00.

New approaches to sustainable financing of immunization were presented, focusing on the creation of fiscal space to enable longer-term funding flows for vaccine purchases. Specific strategies included improving the efficiency of tax collection and increasing indirect taxes on products causing significant public health problems. Also, the critical role of effective national legislation related to immunization was presented. Important legislative benchmarks were highlighted, including the free availability of basic childhood vaccines and the establishment of a line item for these vaccines within the national health budget. The potential usefulness of elements within the legislation linking immunization with reliable longer-term financing sources and strengthening budget disbursement regulations and procedures was discussed. A key message from these presentations was that Ministers of Health could negotiate from a position of strength with Ministry of Finance counterparts using these approaches.

Current initiatives to significantly improve the efficiency of the Revolving Fund supply chain and achieve cost savings for countries were also presented. Specifically, national immunization program managers were briefed on the full range of supply chain costs and steps to identify efficiency gains across the range, including acquisition, procurement, holding, distribution, and utilization costs. Key quality indicators and tools were highlighted, with a focus on the importance of fund cycle time and the implications of timely country payments. The key message from this presentation was that enhanced Regional purchasing power through block vaccine procurement could deliver substantial cost savings, effectively create additional fiscal space, and contribute funds to other immunization program priorities.

A Regional plan for quality control and safety of syringes has been developed to guarantee the quality and safety of the syringes purchased through the RF. This plan emphasizes compliance with international quality and safety standards, and promotes capacity-building within National Regulatory Authorities (NRAs) in the area of syringe quality and safety testing. The expected results of the Plan are highlighted as follows:

- To strengthen the process of syringe acquisition and management through the entire syringe life cycle until final disposal;
- To build capacity for the assessment of quality in syringes by NRAs in five selected countries, emphasizing the training of personnel;
- Ultimately, it is expected that this knowledge can be transferred to the rest of the countries in the Region;
- To set up a dynamic incident reporting system for sharing data on incidents, posting alerts, research findings, and other relevant documents; and
- To promote and train on the proper use of AD syringes, risk management, safe injection practices, proper disposal, and final waste management.

Recommendations

- Use immunization legislation to ensure a budget line for vaccines and supplies; thus, opening fiscal space for immunization programs. Countries that do not have such

legislation in place are encouraged to work with their ministries of finances and the congress to create a budget line for immunization.

- Complete the evaluation of the RF in order to expand its role as in-bulk purchaser, improve its efficiency, and position it for the future in the context of new vaccine introduction. Additionally, the RF can influence on the creation of fiscal space for vaccines at the national level.

- Complete the Regional quality control plan for syringes purchased through the RF, from their procurement to their final disposition.

- PAHO should develop guidelines regarding the selection and procurement of needles and syringes, especially for immunization purposes, that can be updated on an annual basis.

12. Completion of the PAHO-WHO/UNICEF Joint Reporting Form

The collection of immunization data has been instrumental in developing control and elimination strategies for vaccine-preventable diseases in the Americas and monitoring their progress. As part of PAHO's efforts to harmonize immunization data between PAHO, WHO, and UNICEF, since 2005 the PAHO-WHO/UNICEF Joint Reporting Form (JRF) was implemented to collect immunization data for countries of the Americas. All countries, but Aruba, some of the islands from the Netherlands Antilles, and Montserrat, submitted the JRF. However, most forms arrived after the April deadline and several were incomplete.

To facilitate the completion of the JRF for Caribbean countries, next steps include having the form readily available in Excel and in MS Word, increasing the size of the tables for those completing them manually, and improving instructions for table completion.

Recommendations

- Recognizing the importance of having quality data to produce meaningful information, countries are encouraged to improve the completion of the JRF and the timeliness of form submission.

- Joint efforts to promptly resolve questions and/or problems arising during JRF completion, or any other instance of data sharing, should be conducted by PAHO and countries.

13. Regional Caribbean Cooperation

CAREC's Strategic Plan and Surveillance Priorities:

The main expected results from implementation of the CAREC Strategic Plan 2002-2007 are to strengthen and support national capacity. This will be done by fostering and

sustaining effective health promotion and disease prevention programs for the priority health problems stated in the Caribbean Cooperation in Health. In addition renewing and strengthening CAREC as an essential piece of the Caribbean public health infrastructure is also required. The first objective in the CAREC Strategic plan for 2002-2007 is strengthening national and regional surveillance and response. At this time CAREC is awaiting results of the current review of Regional Health Institutions and the Caribbean Cooperation in Health (CCH-2 to CCH-3).

The imminence of Caribbean Single Market Economy (CSME), the existence of the Millennium Development Goals (MDGs), and the Report of the Caribbean Commission on Health and Development all fuel the decision-making of CAREC. The health priorities in the draft CCH3 are: Communicable diseases (HIV/AIDS/STI, EPI, food & waterborne, vector borne, respiratory [Influenza], antimicrobial resistance, EIDs); chronic non communicable diseases and behavioral risks; injuries, violence and substance abuse; food and nutrition; environmental health and management; family health; health systems and services; IHR requirements; human resource development; health information systems; and health promotion/education capacity. CAREC's priorities for surveillance are also reflection of these regional priorities.

CARICOM:

Dr. Robert Brohim of the CARICOM Secretariat noted that Immunization had been a priority in Regional Caribbean Cooperation in Health-2 [CCH2] and he was sure that this area would continue to be recognized and expanded as a priority within the new CCH-3. CARICOM was encouraging its Member Governments to mobilize more financial resources for health to at least to 6.0% of the total GDP, allowing for additional funding for immunization, among other things. He further indicated that a review of the Regional Health Institutions and their core mandates, such as of CAREC, which provided important support for Immunization initiatives in the Caribbean, is being conducted so that there would be also be more congruency between these institutional mandates and the CCH-3 priorities.

Recommendation

- Immunization should be maintained as a priority on the Caribbean Health Policy agenda [CCH-3] and an assessment and subsequent program focusing on the expanded use of currently under-utilized vaccines should be developed with the support of CARICOM and PAHO.

IV. Financial Analysis of 2006 National Work Plans

All countries attending the meeting presented and discussed their 2006 National Work Plan of Actions, outlining the 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 2006 is in the order of US $18.6 million, of which 94% will come from national budgets.

The following is the distribution of these funds by source of funding, as requested by the national representatives. It may be noted that funds from the external agencies were not committed as of the meeting; this will require further negotiations at the country level. Countries did a better job estimating their operational costs; nevertheless EPI managers should carefully consider salaries of personnel for the routine delivery of immunization services in their estimates.

National Funds	US $	17,414,000
PAHO	US $	683,000
UNICEF	US $	267,000
OTHER	US $	20,000
TOTAL	**US $**	**18.6 million**

Special attention was paid to quantifying requirements for (1) VWA 2006; (2) Cold chain replacements in response to hurricanes; (3) Conducting country evaluations; and (4) Outlining a fundraising strategy with the support of CARICOM. All countries will use their Plans of Action to assure national commitments within their budget processes and to negotiate with partners.

V. Caribbean Surveillance Award

An annual 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 and until a new country is selected to receive the award. The Award is announced during the annual Manager's Meeting.

Belize received the 2005 Surveillance Award. Awards for the second and third place went to Barbados and Trinidad & Tobago, respectively.

The Henry C. Smith Immunization Award is presented this year to Suriname. The award is in honour of Mr. Henry Smith who was the first PAHO-EPI technical officer for the Caribbean sub-region. His service in the region spans 18 years. The immunization trophy is awarded to the country which has made the most improvement in EPI.

Participants at the 22nd Caribbean EPI Managers' Meeting congratulated these countries for being the recipients of awards and extend their compliments to all their health workers for such outstanding performances.

The 23rd EPI Managers' Meeting will be held in November 2006.

A N N E X E S

Annex 1: Measles/Rubella Case Definitions

A **suspect case** is a patient in whom a health care worker suspects measles or rubella infection **or** a patient with fever and rash.

Upon investigation, all suspect cases should be classified into one of three mutually exclusive categories:

- A **laboratory-confirmed case** is a suspect case which has laboratory results indicating infection with a measles/rubella virus **and/or** was epidemiologically linked to a case with such laboratory results.
- A **clinically confirmed case** is a suspect case which has not been adequately investigated.
- A **discarded** case is a suspect case which, upon adequate investigation that includes a blood specimen collected in the appropriate timeframe, lacks serologic evidence of an infection of measles/rubella virus.

Based on the infection source, confirmed cases should further be classified into one of three mutually exclusive categories:

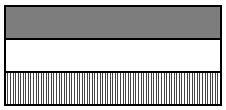
- An **imported measles case** is a confirmed case which, as supported by epidemiological and/or virologic evidence, was exposed outside of the Western hemisphere during the 7 to 21 days prior to rash onset. For **rubella**, the time frame is 12–23 days.
- An **import-related case** is a confirmed case which, as supported by epidemiologic and/or virologic evidence, was exposed locally as part of a transmission chain initiated with an imported case.
- A **case with unknown source of infection** is a confirmed case for which the source of infection was not identified.

Classification of confirmed cases by infection source is critical to evaluate whether endemic circulation of measles/rubella virus has been reestablished in a country. In particular, **reestablishment of endemic transmission** is a situation in which a chain of transmission continues uninterrupted for a period >12 months.

Ultimately, surveillance is meant to provide evidence that the measles and rubella viruses have been eliminated in the Americas. In this regard, **measles elimination in the Americas** is the interruption of endemic measles virus transmission in all countries. **Elimination of rubella and CRS in the Americas** is the interruption of endemic rubella virus transmission in all countries and the absence of CRS cases due to endemic virus transmission.

Annex 2: AFP Surveillance Indicators 2005*

COUNTRY	80% WEEKLY REPORTING UNITS	80% OF CASES INVESTIGATED WITHIN 48 HOURS	80% OF CASES WITH 1 ADEQUATE STOOL SAMPLE TAKEN	AFP RATE ≥ 1:100,000 IN CHILDREN < 15 YEARS
Anguilla				
Antigua & Barbuda				
Bahamas				
Barbados				
Bermuda				
Belize				
British Virgin Islands				
Cayman Islands				
Dominica				
Jamaica				
Grenada				
Guyana				
Montserrat				
St. Kitts & Nevis				
St. Lucia				
St. Vincent & the Grenadines				
Suriname				
Trinidad & Tobago				
Turks & Caicos Islands				



Meet Criteria
Did Not Meet Criteria
Not Applicable

* Up to week 43

Annex 3: Goals and Strategies for the 2006 VWA in Caribbean Countries

Country	Target Population	Risk Criteria	Vaccines	Population Goal	Type of campaign	Strategies
Anguilla	New Employees Policemen Custom Officers Hotel Workers Schools	High-risk workers and travelers	Hep B Td (Adult) MMR	250	Mop up	Education, print, electronic, discussion: committee for VWA
Antigua & Barbuda	1-3 years 4-19 years WCBA aged 20-30 years	Threat to diphtheria, tetanus, AFP, Rubella, CRS	DT/OPV for children aged 1-3 years MMR2		Mop up, door to door, home visit	Identify population, send letter to identified population. Education and assessment of immunization status
Aruba	<1 year Defaulters for DT/IPV-5	Defaulters and Un-immunized	MMR DT/IPV-5	200 (MMR) 300 (DT/IPV5)	Mop up targeted for defaulters and un-immunized	Extended opening hours. Use of voice and print media
Barbados	Defaulters from primary immunization	Defaulting parent/guardian	Pentavalent MMR	>350	Individual F/U visiting	PR-TV and other media; training; extension into child month
Bermuda	Seniors High-Risk Cccupations	Occupational	Td Hep B	300	Vaccination of new employees, EPI updates and seniors	Vaccine campaign to educate and vaccine deficiencies according to EPI practices
Bonaire (NA)	14 months-18 years		MMR	3,200	First and second doses	Re-registration; increase public awareness
British Virgin Islands	1 year olds	Missed dose, un-immunized and non-immune	MMR Hep B Rubella TT	100	Mop-up targeted to health workers	Review of vaccination registers and HCWs vaccination campaign
	Health workers			300		
Cayman Islands	<5 years	Unimmunized children	MMR Varicella		Catch up	Social mobilization, late clinics
Curaçao (NA)	General Population				Increase public awareness	Media
Dominica	High School Student College Students Adults	Increase knowledge on EPI in target group			Awareness campaign	Newspaper articles, electronic media, town hall discussion, PTA meetings, school presentations
Grenada	Elderly in Homes Children at Risk Health Workers		Influenza		Social mobilization for influenza and mop up of children under 5	Leaflet on influenza, radio and TV coverage, house to house
Guyana	General Population and Defaulters	Defaulters	All antigens	1527	Increase awareness; Mop-up	Media- voice and print; home visits

Country	Target Population	Risk Criteria	Vaccines	Population Goal	Type of campaign	Strategies
Jamaica	1-6 years	low coverage areas	MMR 12% OPV 10%	34,920 (MMR) 29,100 (OPV)	Ttargeted outreach, preparation for school entry	Community sessions, evening clinics, liaison with schools
Montserrat	High risk groups Adults >25 years New Employees School Entrants Police, Fire, Defense Force Officers	High risk workers and travelers	Hep B TT MMR Polio TD Td Yellow Fever	250	Mop up	Education, community visits, school health program
Saba (NA)	General Population				Increase public awareness	Media
St. Eustatius (NA)	9-10 year-old defaulters (50 clients)	Defaulters un-immunized HCWs	MMR2 Hep B	50 (MMR) and 10 HCWs (Hep B)	Targeted school and workplace visits	Media and personal persuasion
St. Kitts & Nevis	<5 years	minority susceptibles	all antigens	TBA	Social mobilization and mop up	Home visiting, media coverage, lecture/discussion, distribution of leaflets
St. Maarten (NA)	General Population				Increase public awareness	Media
St. Vincent & the Grenadines	<5 years	Minority susceptibles	all antigens	TBA	Social mobilization and mop up	Media coverage and distribution of leaflets
Suriname					Mop up in low coverage areas	
Trinidad & Tobago	WCBA Vulnerable Groups	Remote areas and socio-economic aspects	MMR for WCBA Td for vulnerable groups	100% of WCBA and 90-95% of Vulnerable groups		Outreach activities, open house, mobile units
	11 year.old Older Population	Cultural	Td	100% and 90-95%		Public service announcements
	Foreign travelers Hunters Forestry Workers	Exposure, beliefs and practices	Yellow Fever	100%		Multimedia, posters, handouts, literature.
Turks and Caicos	School-age children 5-18 years	High risk groups and health care workers who are not immunized	Hep B	400		Talk shows on TV and radio, print media, immunize in schools, health institutions and business places; outreach in general public
	15 to 49 years		MMR	TBA		

Annex 4: Rotavirus Standardized Case Definitions

Suspect Case:

Children aged <5 years hospitalized for acute diarrhea, defined as three or more liquid or semi-liquid stools within the previous 24 hour-period.

Exclusion criteria:

1. Children who were hospitalized for causes other than diarrhea but present diarrhea after hospitalization.
2. Children previously hospitalized for more than 24 hours due to diarrhea.
3. Cases of diarrhea with duration of more than 14 days.

Confirmed Case:

Suspect case in which rotavirus is demonstrated in stools through immuno-enzymatic assays.