



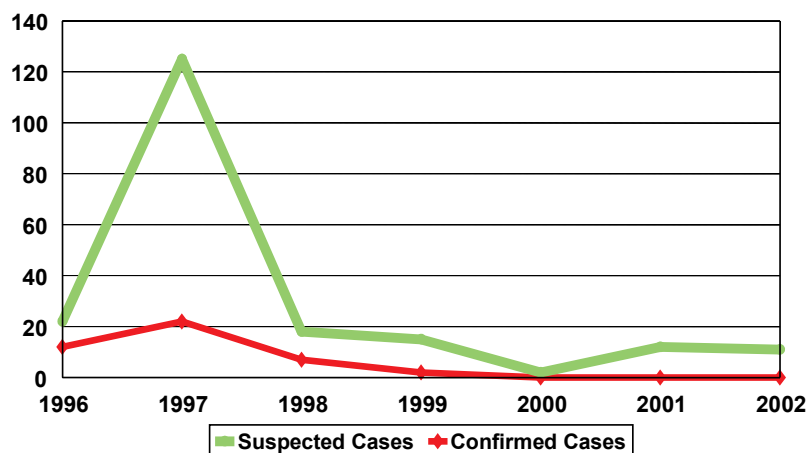
PAN AMERICAN HEALTH ORGANIZATION
Pan American Sanitary Bureau, Regional Office of the
WORLD HEALTH ORGANIZATION



DIVISION OF VACCINES AND IMMUNIZATION (HVP)

NINETEENTH CARIBBEAN EPI MANAGERS' MEETING

Reported Suspected and Confirmed Cases of CRS
English-speaking Caribbean & Suriname, 1996 - 2002*



Source: MOH Reports to EPI/CAREC

* As of week 39 2002

FINAL REPORT

St. John's, Antigua
16 – 19 December 2002

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I. Introduction

The Nineteenth Meeting of the Caribbean EPI Managers was held in St. Johns, Antigua, from 16-19 December 2002. Dr Sealey-Thomas, Medical Officer of Health, on behalf of the Ministry of Health, Antigua, welcomed participants to the Meeting. Dr. Peter Figueroa, Principal Medical Officer, Ministry of Health, Jamaica, and member of the Technical Advisory Group (TAG) on Vaccines and Immunization of the Pan American Health Organization (PAHO) chaired the meeting. Dr. Gina Tambini, Acting Director of PAHO's Division of Vaccines and Immunization (HVP), served as Secretary. Opening remarks were also made by Ms. Sandra Plummer, representative from CARICOM and Dr. James Hospedales, Director of CAREC.

Sir George Alleyne, outgoing Director of PAHO, addressed the participants to the meeting and personally thanked the EPI Managers for their efforts, often taken for granted, but of considerable public health impact nevertheless. He noted that there could be no doubt about the improvements in health in the Caribbean from a situation of high infant mortality and malnutrition 70 years ago, to life expectancy now in excess of 70 years and infant mortality around 20 per thousand live births. Much of the health gains had come from the prevention of infectious diseases through immunization.

Sir George identified the challenges still to be faced, notably the need to persuade others of the benefits of health interventions such as immunization, the maintenance of leadership such as enjoyed so far, the previous political support, the high quality public health services, the benefits of Pan-Caribbean activities, the supply-driven approach as in immunization services, the difficulties in sustainability, the false dichotomy between demands for personal health as opposed to population health, and the need to continue to share experiences. Sir George also took the opportunity to acknowledge the highly effective and pioneering contribution made by Dr. de Quadros, former Director of the Division of Vaccines and Immunization and present at the meeting. Dr. Carlos Mulraine, Chief Medical Officer for Antigua provided the official opening and Keynote Address. Ms. Selina Grant, EPI Manager for Antigua, gave the Vote of Thanks.

The Meeting brought together over 60 health officials from 28 countries of the English-speaking Caribbean, Suriname, the Netherlands Antilles, Aruba, the French Departments of Martinique and French Guyana, the United States and the US Virgin Islands, Canada, the United Kingdom. PAHO/HVP staff and consultants as well as staff from the Caribbean Epidemiology Center (CAREC) and the Caribbean Program Coordination Office (CPC) also attended.

II. Objectives of the Meeting

In addition to EPI program reviews and development of annual work plans for the year 2003 by each country, the main objectives of the Meeting included:

- Determining the progress towards the CARICOM goal for eradication of rubella/CRS by the year 2000, including status of rubella campaigns;

- Determining the status of measles eradication in each country, maintaining the Caribbean free of measles;
- Reviewing the surveillance of AFP in order to assure that the Region meets the Certification Criteria for Polio Eradication as demanded by the Global Commission;
- Discussing the status of implementation of the Invasive Bacterial Infections Surveillance System;
- Vaccination of HIV-positive children and other special groups;
- Management of infants with invasive *Haemophilus influenzae* type b infection;
- Reviewing immunization safety issues;
- Discussing the challenges to maintaining and sustaining high coverage;
- Reviewing the rationale for introduction of varicella vaccine;
- Review recent reports of tetanus and neonatal tetanus;
- Revision of the Plans of Action for 2003.

III. CAREC Priorities:

There are two main impacts intended from the CAREC Strategic Plan for 2002-2007, namely to strengthen and support the national capacity to mount and sustain effective health promotion and disease prevention programmes for priority health programmes; and secondly to renew and strengthen CAREC with new physical facilities and institutional strengthening to provide high quality laboratory diagnostic services at both regional and national levels.

The Plan seeks to deliver strategic objectives aligned with essential Public Health functions within CAREC Multi-Lateral Agreements, will maintain and strengthen laboratory services and surveillance, will boost health information and communication, and will provide a comprehensive financial plan.

Conclusions and Recommendations

Key Points:

- Control of vaccine preventable disease remains exemplary in the countries of the sub-Region, and all should be congratulated on their efforts. There continues to be no confirmed measles cases, despite careful surveillance. For 2002 there have been no laboratory confirmed cases of rubella. The last case of CRS occurred in 1999 in Suriname.
- Final data for mass rubella campaigns show that the range of coverage attained by the countries varied from 64% to 97%. Those countries, which did not reach high coverage, need to be aware that recurrence of rubella is possible and continue efforts to vaccinate those who may have been missed.
- Bahamas and Trinidad and Tobago are completing their *follow-up* activities for measles immunization this year. PAHO recommends that high coverage of at least 95% in each district is essential to maintain the interruption of measles transmission. If susceptibles

accumulate the risk of measles resurgence cannot be ignored and a campaign should be implemented.

- There needs to be continued, and indeed improved, attention to detail of rash/fever and AFP surveillance. This requires audited active searches for cases to ensure that no cases are overlooked. Samples from AFP and rash/fever cases must be taken in a timely fashion, submitted with all appropriate information, and utilizing rapid transport to the appropriate laboratories.
- Compliance with high standards of surveillance is undeniably difficult, but each country needs to set its objectives at these heights so that the gains to date can be consolidated for the future. The key to these achievements is the application of good program management – and this sub-Region has an excellent reputation in this regard.
- The burden of cases of tetanus – both in neonates and in children and adults - has been highlighted and is serious cause for concern. Cases that are occurring may be preventable by better focusing on hard-to-reach groups and better management of tetanus-prone wounds. Opportunities should not be missed to protect women of childbearing age, and pregnancy is not a contraindication to tetanus toxoid immunization. Td (adult Tetanus, low dose diphtheria) should be used in adults.
- Despite the recommendations made at last year's meeting, the newer Dutch-speaking members of CAREC have not been able to submit surveillance reports for incorporation into the weekly reporting system for rash/fever and AFP surveillance. PAHO continues to recommend that the French Departments explore ways by which they can be incorporated into the PAHO EPI Weekly Surveillance reporting system. PAHO/CAREC is ready to provide technical assistance for installing the software and training their health staff in reporting procedures. In addition, the above-mentioned Dutch-speaking countries should prepare annual Plans of Action so that EPI progress can be measured effectively across all CMC members.

1. Measles, Rubella and CRS Elimination

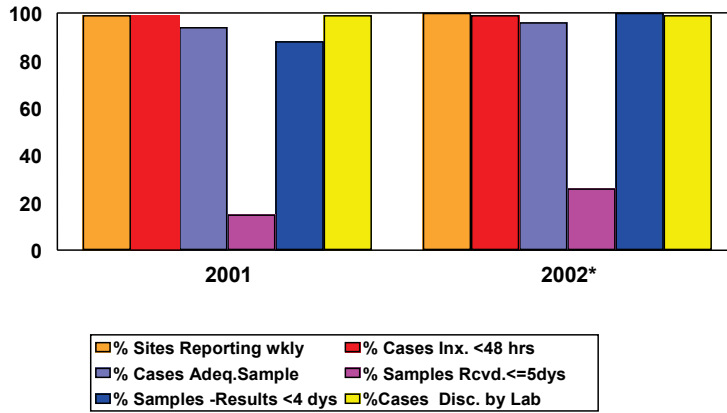
The last indigenous confirmed measles case occurred in 1991.

Between 1991 and 2002 (Week 39), 5,289 suspected cases have been notified from 660 reporting sites, with 99% compliance with weekly site reporting. Laboratory testing was conducted in 97% of cases. All cases were investigated within 48 hours, 96% had adequate samples taken and 100% received laboratory results in less than 4 days. Ninety nine percent of specimens were discarded by laboratory testing.

However, the percentage of samples reaching the laboratory in less than 5 days has remained problematic over the years. In 1997, only 14% of the specimens arrived at the regional laboratory in less than 5 days. In 2001, the percentage was 35% and 27% in 2002 (Week 39).

Of those tested, 5 were confirmed cases of measles, 771 were cases of rubella, 252 were cases of dengue and 4,163 cases were neither measles, rubella nor dengue. The five laboratory confirmed measles cases were imported from North America and Europe. The last imported case was in 1998.

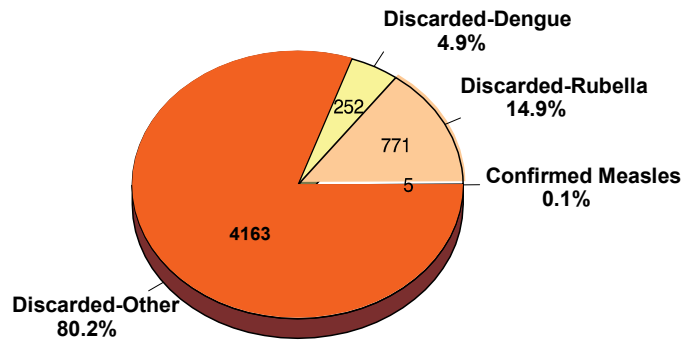
Status of Indicators of Measles Surveillance
English-speaking Caribbean and Suriname, 2001 – 2002*



Source: MOH Reports to EPI/CAREC

* As of week 39 2002

Classification of Suspected Measles Cases
English-speaking Caribbean and Suriname, 1991 - 2002*



Source: MOH Reports to EPI/CAREC

* As of week 39 2002

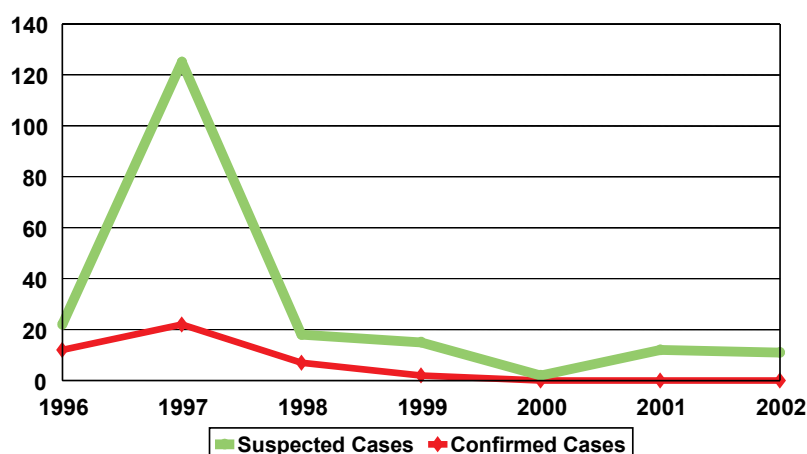
Other diagnoses of the fever/rash cases (neither measles, rubella nor dengue) were Human Herpes Virus Type 6 (HHV-6), scarlet fever, and allergic reaction to food and drugs.

In 2002 (up to week 39), 358 suspected cases have been reported; 42 cases were laboratory confirmed as dengue; 308 cases (87%) were discarded as neither measles, rubella nor dengue.

Since the initiation of the CRS surveillance system in 1996, 43 CRS cases were confirmed from 7 countries. Of the suspected cases (171) reported from 1997 to 2002 (Week 39), 31 (18%) of the cases were laboratory confirmed as CRS. The last confirmed case was in 1999. There were reports of 4 deaths in the CRS confirmed cases.

Reported Suspected and Confirmed Cases of CRS

English-speaking Caribbean & Suriname, 1996 - 2002*



Source: MOH Reports to EPI/CAREC

* As of week 39 2002

In 2002, eleven suspected cases of CRS were reported from Barbados, Guyana, Jamaica, and Suriname, up to week 39. The age range was newborn to 12 months. Laboratory testing at CAREC was done for all the cases. All suspected cases were negative for rubella IgM except for a 13 month old baby (with microcephaly) from Jamaica. In-depth investigation revealed that the child was vaccinated 24 days prior to the sample collection date. The sample was positive for rubella IgM and IgG.

The sources of information of suspected CRS cases have been reviewed. About 80% of the specimens from suspected CRS cases were referred when the cases were in hospitals. When the data of confirmed CRS cases were reviewed, about 95% were diagnosed by physicians and 90% diagnosed while the infants were in hospital

Training of health practitioners in CRS surveillance was focused on community health practitioners and paediatricians. However, most of the referrals have been from hospitals and not primary health care centres. Paediatricians and doctors are responsible for over 90% of the

referrals. Within the first two months of life, when most of the diagnoses are made, the interfacing mainly occurs between infants and physicians rather than infants and community health nurses. Therefore, training in CRS surveillance needs to focus primarily on hospital staff with community health staff being the secondary group.

Measles Follow-up Campaigns

The first follow-up campaigns for measles were conducted between 1995/1997. The second round of follow-up campaigns was due to be implemented in 2000/2001. Bahamas and Trinidad and Tobago were expected to complete their follow-up campaigns in 2002. Of the seventeen remaining countries, nine have implemented two-dose programs with the second dose given at either two years or before school entry at 4–5 years. These countries are reporting second dose coverage in excess of 90%. This strategy does not prevent the build up of susceptibles from occurring overtime and eventually a campaign will be needed to avert the risk of measles resurgence. Eight countries conducted campaigns with the coverage being greater than 85%.

Barbados was due to conduct a follow-up campaign in 2000. However, the present coverage for the follow-up campaign dose of measles is approximately 40%. Special efforts will need to be undertaken by the Ministry of Health, Barbados to ensure that the target population is appropriately vaccinated.

Rubella Mass Campaigns

Starting in 1998, rubella vaccination campaigns were conducted in 18 of the 19 countries. The target population (males and females, except Belize who targeted females only) with the most frequent age group (20-39 years) is approximately 2.216 millions. As a consequence of the rubella mass campaigns, targeted at men and women, the number of rubella cases has decreased markedly since 1997 and there have been no confirmed rubella cases since 2001. There have been no CRS cases detected since 1999.

For countries that have not achieved 80% or greater, assessing alternative strategies to improve immunization coverage is essential. All of the countries need to ensure that strategies are in place to detect and vaccinate those still requiring vaccination.

Conclusions and Recommendations:

- No cases of indigenous measles have been detected in the English-speaking Caribbean since 1991. There have been no indigenous cases of rubella since 2001 and CRS since 1999.
- Reported MMR coverage in the English-speaking Caribbean and Suriname has fluctuated from 92% in 1996 to 85% in 1999, 94% in 2000, and 88% in 2001.

- Importation of measles and rubella remains a significant risk until measles and rubella control accelerates in many other parts of the world.
- In order to reduce the build up of susceptibles, countries are either providing routine second doses of measles/rubella containing vaccine, or carrying out follow-up campaigns targeted at children aged 1–4 years.
- At least 95% of each birth cohort must be vaccinated with a measles and rubella containing vaccine at 12 months of age. Highest possible coverage for the first dose of measles containing vaccine remains the first priority. High coverage (95% or more) must be achieved and maintained in each district with each dose. If susceptibles accumulate through either low coverage campaigns or low second dose coverage, then the risk of measles resurgence cannot be ignored – and a campaign should be implemented.
- Compliance with surveillance indicators must be maintained and the full collaboration of private sector providers must be continued.
- Excellent surveillance of measles and rubella must be continued to document the absence of indigenous cases.
- To confirm suspected measles and rubella importations and facilitate identification of the source of the viruses, specimens must be collected, properly processed and stored for virological identification through genotyping.
- Whenever possible, naso-pharyngeal swabs should be taken from suspected cases so that virus culture can be undertaken, before all opportunities for virus identification are lost.
- Meticulous attention to detail in completion of investigation forms, timely handling of samples and their transport must be maintained.
- Surveillance of CRS, that is essentially hospital-based, needs to continue.

Measles in the Region of the Americas

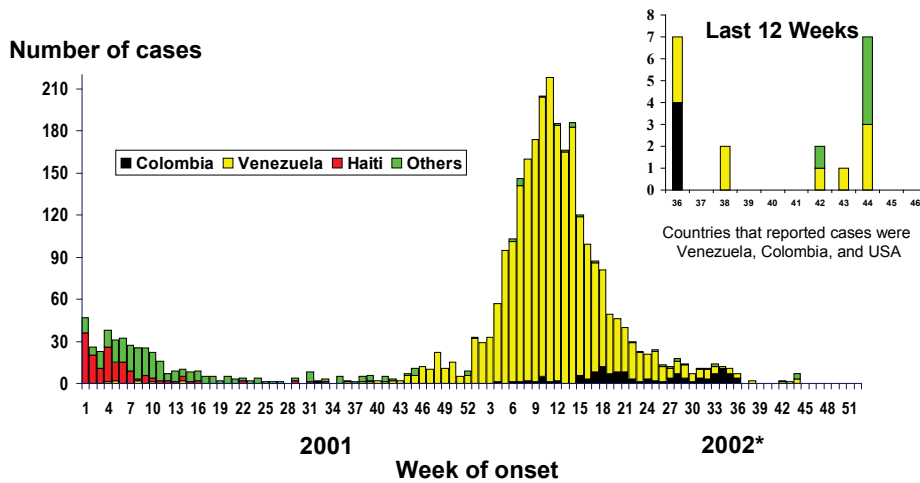
Following the progressive implementation of recommended strategies to eliminate measles, numbers of confirmed cases have declined progressively, apart from in a few countries where the strategy was either not followed or not fully implemented. Experience from the Americas shows those programs with systematic and thorough supervision, including active case-finding, house-to-house monitoring and follow-up, can successfully interrupt measles transmission.

In 2001–2002, cases have been restricted to essentially four countries – Colombia, Dominican Republic, Venezuela and Haiti. In May and September 2001, respectively, the Dominican Republic and Haiti interrupted measles transmission, effectively ending known indigenous transmission of the D6 measles virus. This genotype had circulated widely in the Region since at least 1995.

In September, 2001, after an importation from Europe, a new measles genotype, d9, was introduced in Venezuela. The epidemic spread to neighboring Colombia in January 2002. As of 7 December 2002, a total of 2,392 cases have been confirmed in Venezuela and 128 in Colombia. After substantial vaccination efforts in both countries, the last reported confirmed cases (6) occurred in Venezuela with onset in week 46/2002.

Outbreak investigations performed in the Region continue to show that the group at highest risk for measles is unvaccinated young children. Another group at high risk of acquiring and/or transmitting the disease is health care workers, especially those who work in emergency rooms or who treat acutely ill children.

Measles in the Americas, by Week and Country 2001 - 2002*



Source: PAHO

* As of week 48 2002

Given that measles is highly endemic in other regions of the world, the Americas continue to be under constant threat of importation of measles virus from other regions where the disease remains endemic.

United States

Based on the available information, a panel of experts concluded that measles is no longer an endemic disease in the United States.

Since 1993, the incidence of measles is extremely low, below 1 case per 1,00,000 inhabitants. The majority of the cases are imported. The last outbreak, as a result of imported virus from the Philippines, occurred in October 2002 and involved 12 cases. The surveillance system is sufficiently sensitive allowing detection of imported cases. The population immunity

is high, with coverage over 90% for the 2-dose schedule and a seroprevalence of 93% at 6 years. No cases of the previously circulating genotype have been found.

Canada

Canada has achieved their goal to eliminate indigenous measles.

In 2001, 34 cases were reported - all imported or linked to imported virus. Twenty-five cases (74%) were associated with 8 small clusters, with a size ranging from 2-8 cases. Over all 3 different genotypes of measles virus were identified as associated with importation: H1, D3, and D5. Since 1998, measles transmission has been interrupted. In outbreaks occurring between 1999 and 2001, limited secondary transmission among members of unimmunized families/communities occurred.

Measles in the United Kingdom and importations from the European Region and elsewhere

In the United Kingdom, the transmission of measles has been interrupted since 1994. Recently, coverage at 2 years has fallen from 92% to 84% because of fears over vaccine safety. Research among parents shows that when there are vaccine safety concerns, the response is often to delay acceptance of the vaccine. In 2002, a school-based outbreak involved 100 cases in children whose parents had rejected immunization. Almost all cases occur in unimmunized individuals, with around 7% in those who have had one dose of measles containing vaccine. No case occurred in an individual who had received two doses of vaccine.

Measles surveillance is based on salivary sampling for measles specific IgM. The same sample is used for genotype analysis of confirmed cases, permitting the origin of the strain to be identified. For the period 1995 to 2002, 665 cases have been reported – a population rate of 0.18 per one hundred thousand. Out of the total confirmed cases, 23% of the sporadic and 43% of the cluster cases were imported.

Importations are occurring from all regions of the world, but Western Europe and South East Asia are responsible for the highest numbers of importations, reflecting patterns of population movement. Clusters were particularly seen at universities with foreign students, schools, nurseries and hospitals.

Rubella Regional Overview

In 1999, the MESS system was expanded to a measles/rubella integrated surveillance system. In 1998, 135,947 rubella cases were reported: Three countries (Argentina, Mexico, and Venezuela) accounted for the majority of the cases. Since 1999, there has been a significant decrease in the number of reported cases of rubella (58,764). In 2000 and 2001, there were 64,431 and 50,304 cases of rubella reported, respectively.

As of December 2002, 41 of the 44 countries and territories had introduced rubella-containing vaccine in their national childhood immunization programs. The remaining three

countries will follow suit in 2003 and 2004. Benefits have already accrued as a result of the heightened attention given to rubella and congenital rubella syndrome in the Region, following the 1997 TAG recommendations. Chile, Costa Rica, Brazil and Honduras have conducted adult mass vaccination campaigns for accelerated rubella control and CRS prevention: Brazil and Chile have targeted these campaigns at women only; Costa Rica and Honduras have carried out rubella campaigns that included men and women.

The vast majority of suspected measles and rubella cases in the Region have adequate serum samples taken. In general, regional laboratory indicators demonstrate that the laboratory network is functioning at a high level of performance. In addition, testing results of quality control panels demonstrate a very high level of laboratory competence. However, several areas of concern are noted. Few countries have been able to ensure that 80% of specimens arrive to the laboratory in a timely manner. This may, in part, be due to the need for increased coordination and communication between clinicians, epidemiologists and laboratorians. Regardless, viral isolation is critical to ensure determination of genotypes, for evaluation of the measles program in the approaching post-elimination phase, as well as to determine the extent of rubella transmission in the hemisphere.

Finally, it is important to keep in mind that countries should expect to see laboratory false-positive cases. To this end, laboratory procedures to establish which laboratory results are false-positives are available

2. Rubella Elimination in the United States

The number of reported rubella cases has declined from 57,600 in 1969 to 23 cases in 2001. The number of reported CRS cases have also declined over the same period by 99% with only 3 cases reported in 2001.

Since the beginning of the 1990s, the epidemiology of rubella has changed significantly with the proportion of cases in older individuals rising progressively. Since 1998, data show that of the 63 to 79 percent of persons with confirmed rubella and known country of origin, more than 90 percent were migrants from Mexico, Central America, and the Spanish-speaking Caribbean where a rubella-containing vaccine was not available or accessible and therefore they were never vaccinated. However, in 2001, of the 17 persons with known country of origin, 9 (53%) were born outside the US with only 3 from countries in the Western Hemisphere. Of the 35 reported infants with CRS born from 1997 to 2001, 31 (89%) were born to mothers whose origins were outside of the US and who may not have had an opportunity to be immunized against rubella.

Rubella and CRS have declined dramatically reaching record low numbers of reported cases of rubella in 2001. Advances in laboratory surveillance techniques have allowed for greater insight into the rubella viruses circulating in the USA. The reduction in the burden of rubella and CRS in the United States is due in part to the collaboration between PAHO and countries of the Western Hemisphere.

Rubella Elimination in Canada

In November 2001, an expert committee was formed to set priorities for rubella elimination, surveillance strategies and technical issues. The very low incidence of rubella (<1 case per million population) and CRS suggests that Canada is getting closer to achieving the goal of eliminating indigenous rubella infection during pregnancy. Only 13 cases of rubella were reported in 2002 and no CRS cases were reported in 2001 or 2002.

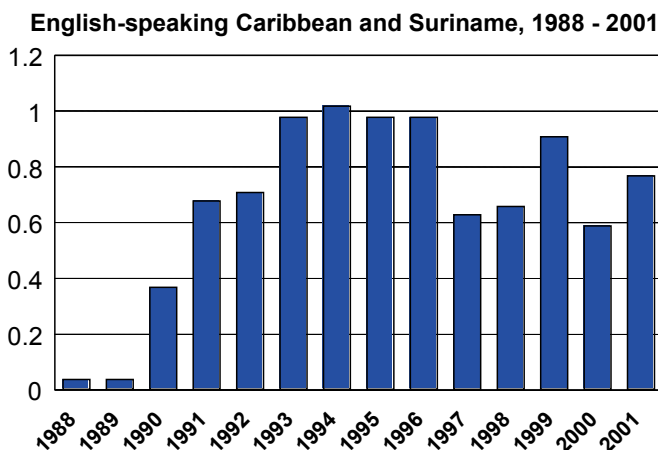
3. Polio Eradication

3.1 Polio surveillance:

AFP surveillance continues from 430 reporting sites throughout the countries. Ninety-nine percent (99%) of the sites have reported weekly up to Week 39 in 2002. From 1994 up to Week 39 of 2002, 156 AFP cases (less than 15 years of age) have been reported from over ten countries.

The annual AFP rate has ranged from 1.0 per 100,000 population less than 15 years of age in 1994 to 0.77 in 2001.

Annual Rate of Acute Flaccid Paralysis (AFP) Cases



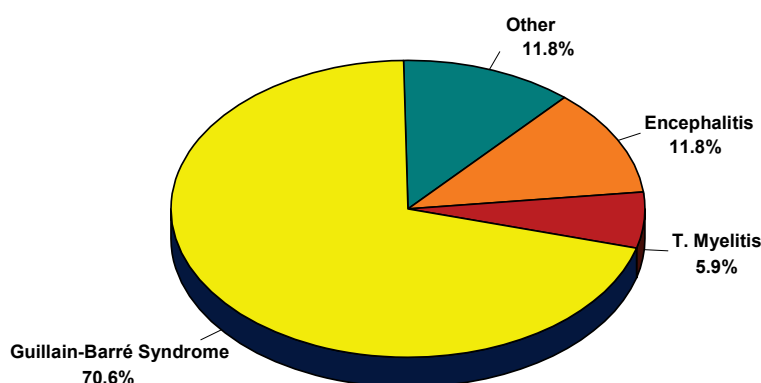
Source: MOH Reports to EPI/CAREC

In 2001, a total of 26 cases of all ages were reported from 5 countries - Cayman Islands, Guyana, Jamaica, Suriname, and Trinidad and Tobago. Seventeen of these cases were less than 15 years of age and were reported from 4 countries. Seventy-one percent of these cases were diagnosed as Guillain-Barré Syndrome (GBS), with other diagnoses being transverse myelitis, encephalitis/encephalopathy, and demyelinating diseases.

Ninety percent of these cases were investigated within 48 hours and 93% had appropriate stool specimens collected. Three countries (Suriname, Trinidad and Tobago, and Guyana) met all four surveillance criteria, Jamaica met three of the four criteria.

Reported Diagnoses of AFP Cases (<15 yrs)

English-speaking Caribbean and Suriname, 2001



Source: MOH Reports to EPI/CAREC

In 2002, up to Week 39, there were 13 cases less than 15 years of age, notified from 4 countries (Guyana, Jamaica, Suriname, and Trinidad and Tobago). Eleven of the 13 cases were investigated within 48 hours of being reported and all had stool specimen collected. Suriname, and Trinidad and Tobago have met all 4 surveillance criteria for AFP, while Guyana and Jamaica met 3 of the 4. The AFP rate for 2002 (Week 39) is 0.59 - far less than the expected rate of 1.0.

Validation

The AFP surveillance system was evaluated in 2002 in three countries - Anguilla, British Virgin Islands, and St. Vincent/Grenadines. Hospital logs for about three years (1999 to 2002) were reviewed. The findings of the review correlated well with the reported surveillance information.

Standardized annual evaluation of the surveillance system is necessary for the larger countries such as Guyana, Jamaica, and Trinidad/Tobago to ensure that no AFP case is being missed. External evaluation has to be completed in Jamaica in 2003 since they have not met the criteria of an AFP rate of 1.0 since 1999. The strategies for eradication (high vaccination coverage and a sensitive and timely surveillance system) have to be sustained in all countries. Vigilance, however, has to be maintained until the world has achieved polio-free status.

Polio Regional Overview

Considerable progress has been achieved in the global effort to eradicate polio. By the end of 2002, three countries in Asia (Afghanistan, India and Pakistan) and two in Africa (Nigeria and Egypt) represent the main areas in which transmission persists. Despite excellent progress in 1999 and 2000 in India, cases have increased dramatically in two Northern Indian states in 2002 with an expected annual total of over 2,000 cases. Further improvements in supplemental activities will need to be made so that global transmission can be interrupted by the year 2005.

The Americas continue to be free of wild poliovirus transmission. However, the recent vaccine-derived polio outbreak in Dominican Republic and Haiti highlights the need for continued high coverage and high vigilance.

The Regional TAG has specified that it will be necessary for every country to achieve and maintain OPV coverage of greater than 90% in every municipality, as well as high quality acute flaccid paralysis surveillance.

Countries of the Region are now moving forward with plans for containment of samples in laboratories, which could contain wild polioviruses. A Caribbean Commission will be established shortly.

Conclusions and Recommendations

- The previously noted concerning decline of surveillance for AFP with substandard AFP rates and inadequate investigation in both sampling rates and timeliness continues. It remains essential for the Caribbean Sub-region to demonstrate extra efforts to raise surveillance standards. The greatest efforts will need to come from the large countries.
- Countries will need to identify the reasons for the decline in AFP rates and take steps to improve compliance with surveillance indicators. Despite this recommendation having been made in 2000, there appear to be no good reasons why AFP rates and compliance with surveillance indicators continue to be below acceptable levels.
- All countries should embark on active searches for AFP cases using retrospective reviews, regular chart exams, and stimulated negative reporting. Training of appropriate health workers must be continued.
- A Caribbean Commission for laboratory containment of wild polioviruses will be established shortly.
- Following the experiences of emergence of vaccine-derived strains of polio, maintenance of high coverage and high quality surveillance will remain essential until polio is eradicated worldwide.

4. Immunization Coverage

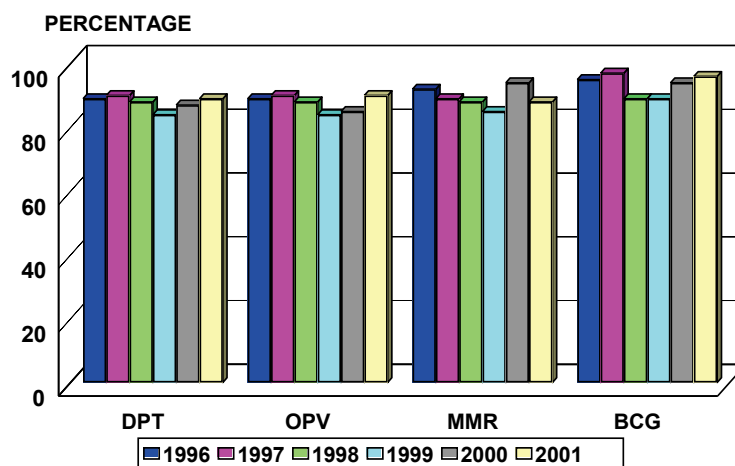
The immunization programme continues to be a priority of the governments of the countries. Vaccinations in the childhood population are delivered by the public sector through the network of clinics in the countries. The private sector continues to play an important role and in some countries, as much as 25-50% of the infant population receives their vaccination through the private sector. The private sector in some countries is requesting to be more involved in the EPI.

In many countries, the vaccines used in the private sector are provided by the public sector source. The public sector should be encouraged to supply the private sector with vaccines. This will ensure that the private sector receives and administers good quality vaccine to patients. The Ministry of Health should evaluate the cold chain status of the private sector site prior to the donation of the vaccine. All conditions necessary for cold chain should be in place. The EPI team should regularly audit/monitor the cold chain status. Immunization data of the private sector should be available to the Ministry of Health. The Ministry of Health should ensure that health providers/practitioners are appropriately trained in the EPI and also that the practices of immunization safety, including disposal of used needles and syringes, are in place at private sector sites.

In 2001, the coverage for all 19 countries was – DPT 89%, OPV 90%, MMR 88%, and BCG 96%.

Immunization Coverage (%) for selected Antigens

English-speaking Caribbean and Suriname, 1996 - 2001



Source: MOH Reports to EPI/CAREC

MMR coverage overall has decreased. The coverage for some other antigens, for example DPT/Hib in some countries, was affected by interruption of vaccine supply.

Countries such as Jamaica and Suriname reported decreased coverage rates in 2001 - Jamaica with decreased MMR coverage and Suriname for all antigens administered. The coverage figures for OPV for the countries ranged from 68 to 100%. The MMR immunization coverage ranged from 82% to 100%, with five countries having coverage between 80% and 90%. Review of countries' vaccination coverage by health regions or districts clearly shows pockets of low coverage. For 2001, in Guyana, 40% of their districts/regions had OPV coverage below 80%, and only one region had coverage more than 95%. In Jamaica, 3 parishes have MMR coverage below 80% and 7 parishes have coverage between 80 and 90%.

Distribution of OPV3 Coverage in Districts of selected Countries, 2001

COUNTRY	TARGET POP. 2001	OPV3 COVERAGE (%)		# ADMIN. AREAS	ADMIN. AREAS OPV3 % COVERAGE 2001				POP. NOT RECEIVED OPV 3 2001
		2000	2001		<50	50-79	80-94	>95	
BELIZE	7332	89	96	6 Districts	0	0	4	4	308
GUYANA	17961	79	90	10 Regions	1	3	5	1	1734
JAMAICA	51947	86	90	14 Parishes	0	0	10	4	4664
TRINIDAD/TOBAGO	17929	90	91	9 Counties	0	0	8	1	1541

Source: MOH Reports to EPI/CAREC

For some countries the coverage for antigens administered in the first 6 months of the year is less than 50%. This is worrying since, from the birth pattern of the countries, the coverage should be 50% or greater.

Vaccine and Logistics Procurement

There was interruption in the supply of polio and MMR vaccines to some countries in 2002. All countries had adequate supply of syringes and needles. Almost all countries have been purchasing their public sector vaccines through the PAHO/EPI Revolving Fund. This fund is also the source of some of the vaccines used by many of the practitioners in the private sector. However, countries willingly shared vaccines in order to lessen the adverse impact on the programme within other countries. Governments will have to ensure that vaccine invoices are paid in a timely fashion and therefore prevent interruption in the vaccine supply.

Conclusions and Recommendations

- Immunization coverage appears to be improving slightly compared with last year's results. However, in some countries, coverage for DTP and polio remains concerningly low and special efforts will continue to be needed to bring about improvements.
- Additional resources will need to be assigned to increase and maintain coverage, especially in hard to reach areas and/or populations.
- Countries such as Jamaica and Belize will need to ensure that densely populated districts/regions in particular have coverage greater than 90%, since they are the most likely places where outbreaks will occur. Similarly, countries with hard-to-reach populations in remote areas, such as Guyana and Suriname, must also ensure that appropriate resources are provided to ensure high coverage.

5. EPI Evaluations – St. Vincent and the Grenadines and Anguilla:

The purposes 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 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.

Common Achievements:

It was evident that the EPI in both countries have been given high priority at all levels. The Governments have shown commitment by adherence to strategies for elimination of measles, rubella and congenital rubella syndrome, and the implementation of the mass adult vaccination campaign for rubella. Political will was demonstrated by vaccine procurement and program support and staff are dedicated to EPI program objectives. Good community participation and client satisfaction were noted. Both countries had a well coordinated and executed programs with annual work plans, monthly evaluations, adequate supplies of vaccines and other materials, and the cold chain was adequately maintained.

Excellent efforts have been made at measuring coverage and implementing surveillance and multiple strategies were employed to reach high coverage. It was noted that in both countries, home visiting strategies were used to achieve high coverage. Vaccination coverage of 95 to 100 % had been sustained for all administered antigens for over 5 years in both countries.

Challenges for the program in St. Vincent and the Grenadines include the maintenance of high coverage, inclusion of Hib and Hepatitis B vaccines into the routine program. While in Anguilla major challenges will be the purchase or construction of an incinerator for the destruction of biohazard materials and improving user satisfaction. The Tables below summarize the major recommendations made by the evaluation teams.

**Major Recommendations resulting from EPI Evaluations
for St. Vincent and the Grenadines and Anguilla**

St. Vincent and the Grenadines	Anguilla
<ul style="list-style-type: none"> • Prepare policies for disposal of biohazard waste and vaccine management in the event of power failures • Update EPI manual • Develop and disseminate Surveillance Manual • Enhance health management information system to include hardware • Obtain adequate funding from the government for all EPI activities • Develop a human resources plan for recruitment, retention, and succession of health staff • Introduction of pentavalent (DPT, Hib and Hep B). 	<ul style="list-style-type: none"> • Procure appropriate refrigerators for two clinics • Develop and implement bio-safety guidelines • Procure and commission an incinerator • Update EPI manual • Develop and disseminate Surveillance Manual • Standardize and print immunization registers • Develop a human resources plan for recruitment, retention, and succession of health staff • Conduct study on clinic dynamics and patient satisfaction.

General Conclusion and Recommendation

- Both evaluations demonstrated that future progress will depend upon improved management practices, good quality data, good supportive supervisory systems and continued political support at all levels to provide the necessary resources.

6. Other topics:

New Vaccines and their Introduction into the Infant Schedule.

Haemophilus influenzae type b (Hib) vaccine is a part of the infant immunization schedule in the public sector in all countries except Dominica, Jamaica, St. Vincent and the Grenadines and Suriname. Presently, 11 countries are using the pentavalent vaccine

(DPT/Hib/Hep.B) and it is envisaged that 2 additional countries will introduce the vaccine in the year 2003. Five countries have concluded hepatitis B vaccine catch-up campaigns for children and adolescents.

One country has introduced varicella in the infant schedule, one is vaccinating health workers in hospital against varicella infection and one is contemplating introduction in the infant schedule together with vaccinating the population of children to 19 years. Health workers and schoolteachers will also be vaccinated.

The surveillance system for reporting these diseases is in place for over 90% of the countries. All countries are already reporting cases of Hepatitis B infection as part of the national weekly surveillance reports to CAREC. Hib infection reporting at national level is occurring in almost all countries. These countries are reporting information on meningitis, while some have included pneumonia and septicemia. The invasive bacterial infection surveillance system implemented in five countries (Barbados, Guyana, Jamaica, St. Vincent and Trinidad and Tobago) require additional technical support for sustaining the programme. The programme implementation is still being presently hampered by the absence of a medical microbiologist at CAREC.

Surveillance for Meningococcal Infection

Meningococcal infection can present as meningitis, septicaemia, or as a combination of both. This means that surveillance needs to include both reporting of clinical cases and microbiological laboratory based reporting. Meningococcal disease cannot be distinguished on clinical grounds from other septicaemic and meningitic conditions such as pneumococcal infection or Haemophilus influenzae type b infections. Early antibiotic treatment of suspected cases, before clinical specimens have been taken, may mean that blood and CSF cultures may be sterile, and in acutely ill children the threshold for lumbar puncture is raised, because of the risks of coning. Thus, any surveillance system needs to incorporate both clinical and microbiological information with reconciling of reports.

Meningococci can be divided into five separate sero-groups, A, B, C, Y and W135 on the basis of the carbohydrate antigens in their coat. Group A is associated with the '*meningitis belt*' of sub-Saharan Africa and epidemics have also been linked with the Hajj pilgrimage to Mecca. Group W135 has also recently been linked with this event. Group B cases tend to be sporadic whilst Group C strains often occur in clusters. Groups B and C are most common in Europe, whilst approximately one third of US cases are Group Y.

Carriage of meningococci occurs commonly although carrier status is often brief. Carriage is most common amongst teenage groups. Risk factors for meningococcal disease include overcrowding, passive smoking and damp environments. Contacts of cases are at approximately 500 fold higher risk than non-contacts, and hence identification of meningococcal disease and relevant strains are important.

Close contacts should be given chemoprophylaxis and those who are contacts of Group A, C, Y and W135 cases should be given vaccine since late secondary cases do occur. Hence,

it is important to identify the strains involved. Although vaccine against Group B strains do exist, they may not be strain specific and are of little effectiveness in children below four years of age.

7. Surveillance for Invasive Bacterial Infection

(a) Management of Hib meningitis- Barbados

Five cases were detected in 2001/2002, all in unimmunized children. All cases attended different schools, lived in different localities and appeared to have no epidemiological links. Outbreak investigation was undertaken and contacts offered Hib vaccine. This episode further justifies the incorporation of Hib vaccine into the EPI in Barbados. It also highlights the need for reinforcement of the surveillance system.

(b) Invasive Bacterial Infection Surveillance - Jamaica

Active surveillance is now in place in sentinel hospital sites in Jamaica for Hib, meningococcal infection and pneumococcal infection. There is also clinical reporting. However, many cases have already received antibiotics and reporting is often late.

There were 46 Hib cases in 2002, one meningococcal and six pneumococcal cases. The majority of Hib cases were less than 5 years of age, pneumococcal cases were less than 2 years. An Invasive Bacterial Disease survey is now in progress with both retrospective and prospective surveillance. Early indicators do support the need for introduction of Hib and pneumococcal conjugate vaccines.

(c) Invasive Bacterial Infection - Bermuda

Bermuda reported no cases of Hib in 2000 and 2001 but one case occurred in 2002. He was fully immunized but did have a cochlear implant. The implant was removed and he made full recovery. In 2000 and 2001 there were no cases of meningococcal infection but one case occurred in 2002. This case was Group B. He made a full recovery and chemoprophylaxis was given widely. Varicella vaccine has been progressively more widely used and reported cases of varicella now appear to be declining.

Varicella vaccine in the Caribbean

Varicella vaccine was introduced in the Cayman Islands into the schedule for private practice in 1997 and in 1999 into the routine Government funded programme. The vaccine has been offered to children and adults.

Discussions started in 1999 about the use of varicella vaccine for hospital staff in Barbados. Previously, staff were only immunized after exposure to a varicella case; between 1999 and 2001 the numbers of doses given to health workers had been increasing. However, most of their contacts were from domestic rather than work contacts. In November 2001, Queen Elizabeth Hospital indicated that 700 health workers needed immunization and approval was given. 1400 doses were purchased at US\$15 per dose.

British Virgin Islands has identified a recent increase in varicella in recent years with 60% of cases in <15 year group. If the remaining 40% of cases occur in those in employment, then the economic burden may justify its inclusion into routine use. It was estimated that a half a day's salary is enough to pay for one dose of vaccine.

Although the vaccine is beginning to be used in the private sector, it has not been introduced yet into routine use.

A selective campaign over a period of 3 months is planned, targeting approximately 5,500 individuals, including children 1-19 years, teachers and health care workers.

Conclusions and recommendations:

Although varicella vaccine has now been introduced into the routine immunization programmes of some countries, notably the US and Japan, there needs to be epidemiological data and economic data reviewed for the Caribbean before any population-based recommendations can be made. At this stage, there may well be a role for selective use of varicella vaccine in high-risk individuals or possibly health care workers. Routine immunization should not be embarked upon without full analysis of the cost-benefit and a commitment to sustain such a programme at high coverage.

8. Integration of immunization in the programme of prevention of mother-to-child transmission of HIV:

In Guyana, the PMTCT is integrated in the MCH programme. Training has been delivered in 2002 and Unicef, CAREC and CDC evaluated the programme in June 2002. Guidelines are available for the management of children and the possibility of PCR testing is being investigated. BCG and OPV are not administered to those children and IPV is used. It is planned to expand the programme to all health care centers, develop guidelines for management of children born to Hepatitis B positive mothers along with continuous monitoring of adverse events after immunization.

The first case of AIDS in Belize was detected in 1986. The challenge today is to reduce vertical transmission of the disease. The surveillance system was launched in December 2000 and progressively extended in 2002. Its goal of the PMTCT is to reduce transmission from mother to child through testing of all pregnant women. The following problems occurred: Limited testing of infants, partly due to mothers' fears of stigmatization, difficulty in following up, and availability of test kits. Some children are tested by PCR at three months of age and given BCG if HIV-negative. The following actions will be implemented: Extension of PCR testing to all children of HIV-positive mothers, revision of the immunization schedule, and introduction of IPV.

The PMTCT was launched in Antigua in March 1999. The test is offered to all pregnant women along with pre-test counseling. HIV positive pregnant women are given AZT, Caesarean section is offered at 38 weeks of gestation, and breast-feeding is discouraged. The immunization schedule for children born to HIV-positive women is the same as that for other infants.

Turks and Caicos has no formal programme. A written protocol has implemented since 1997. Children are tested after 15 months of age and if negative are immunized with OPV. In 2001, 12 babies were born of HIV-positive mothers: only four mothers accepted testing for their children, of which only one was HIV-positive.

Conclusions and Recommendations

- All countries should have specific immunization guidelines for the immunocompromised individual/infants e.g. those with HIV/AIDS
- IPV should be available for persons/infants who are immunocompromised
- All pregnant women should be offered and encouraged to have testing that is confidential
- Prophylaxis should be offered to all women who are HIV-positive
- Women should be informed that vertical transmission could occur before, during and after childbirth
- Health education should also be targeted to health workers.

Community Management of Hepatitis B Positive Cases – Role of Immunization:

In Bahamas, the National Health Strategic Plan includes education of both general practitioners and health care workers, screening and immunization. In 2001, 3,644 persons were screened of which 105 (2.8%) were positive. A child born of a hepatitis B-positive mother is offered immunoglobulin at birth along with the first dose of vaccine. The second dose is administered at one month and the third at six months. Follow up is also offered at a special clinic and at nine months the child is screened again for hepatitis B antigen. Pentavalent vaccine was introduced in 2001. The challenges that remain include the immunization of some at risk children, failure to screen during pregnancy, and harmonization of the schedule since some private practitioners follow the ACIP guidelines.

Hepatitis B is a notifiable disease in St Kitts and Nevis. Management of hepatitis B positive persons includes home visits, screening of family and household members, along with sexual partners, counseling and immunization. Health care workers are one of the target groups for immunization and special programmes are being put in place for primary school children. A follow-up to the 1985 serological survey, conducted by CAREC, is hoped for, so that the impact of the immunization programme can be assessed.

There is routine testing of blood donors in St Lucia; those positive are referred to appropriate clinics. Health care workers are considered at risk and are vaccinated. The following actions are planned: Inclusion of hepatitis B investigation and immunization in STD clinics, follow up and counseling of those positive.

Conclusions and recommendations:

- Individuals who have received a full three-dose course of hepatitis B immunization are expected to have long-lasting immunity. However, because health care workers represent a particular high-risk group, they should be tested every five years and offered booster doses if appropriate.
- Prospective blood donors who are found to be hepatitis B-positive should be counseled and their partners and family should be offered immunization.

Immunization Safety Monitoring

All countries should ensure that a proper reporting system for adverse events following immunization is in place.

Health care workers should be trained in management of adverse events, including immediate management of anaphylaxis, and investigation and reporting of such events.

Pertussis Surveillance

A previously reported pertussis outbreak occurred in Guyana and was associated with transmission from bordering communities in Brazil. Cases continued to occur in 2002. There were doubts whether all the respiratory illnesses with pertussis like symptoms were in fact pertussis since presentations were not typical.

It was recommended that immunization coverage must be maintained in hard-to-reach communities and this may often be especially challenging. The transport of specimens from remote areas was difficult but is important if cases are to be confirmed or rejected. Availability of appropriate media was also a limiting factor.

The possibility that childhood cases were associated with under-appreciated pertussis in adults was discussed. With pertussis vaccination only in the primary immunizations, it is likely that there will be significant numbers of pertussis cases in older children and young adults. Inclusion of whole cell pertussis vaccine into booster schedules in older individuals is not recommended because of its reactogenicity. Acellular vaccines are used in industrialized countries as pre-school boosters, and incorporation into immunizations of older individuals are being evaluated.

Conclusions and Recommendations:

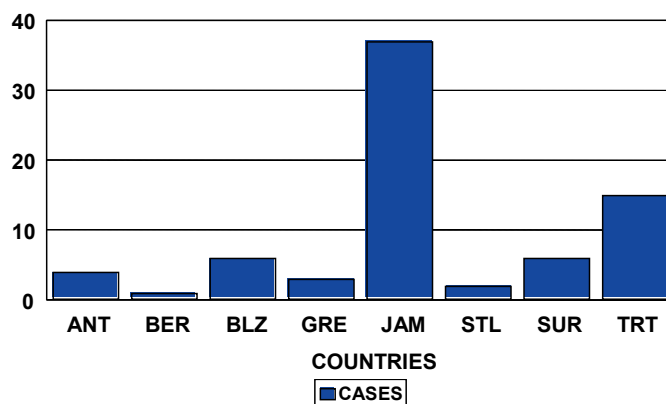
- These outbreaks serve as important reminders that remote communities are particularly vulnerable to importations, especially when coverage is low. Pertussis outbreaks are particularly difficult to interrupt because of the non-classical symptoms in adults, and lack of efficacy of antibiotics unless given early, and the lack of effect of immunization in stopping transmission.
- Providing adequate outreach immunization services to remote populations will require resources to be assigned for these purposes on a routine basis.

9. Tetanus

Tetanus is a notifiable disease in all of the CMCs and reporting to the CAREC has been occurring for over twenty-one years. Tetanus cases are usually reported through passive reporting systems. The Ministries of Health should report to CAREC on a weekly basis. The reporting system had required only number of cases initially, but case investigation reports are now being requested.

Between 1997 and 2001, a total of 72 tetanus (excluding neonatal tetanus) cases were reported from 8 countries of the Caribbean Community (CARICOM).

Distribution of Reported Cases of Tetanus* by Country
English-speaking Caribbean and Suriname, 1997 - 2001



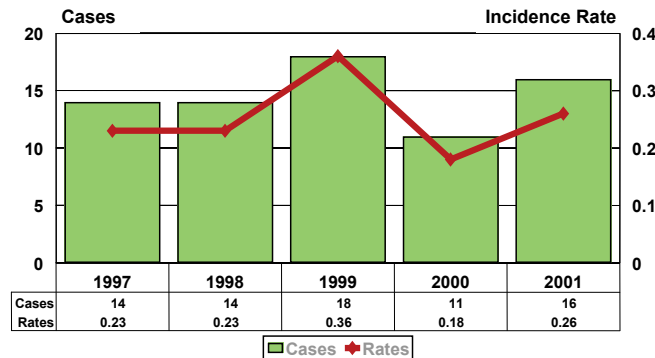
Source: MOH Reports to EPI/CAREC

* Excluding neonatal tetanus

Positive and zero reporting are provided by 19 countries. The incidence rate for tetanus (excluding neo-natal) for 1997-2001 ranged from 0.18 to 0.36 per hundred thousand. Eighty-one percent of cases were males, 19% were females, with ages ranging from 1 year to 85 years, with the most cases occurring between 61–85 years. The average age was 44 years. There were 8 cases below age 9 years and 3 cases less than 5 years of age.

Information on morbidity/mortality of tetanus cases was available for 49 of the 72 cases. Of these 49 cases, 27 died in hospital resulting in a case fatality ratio of 57%.

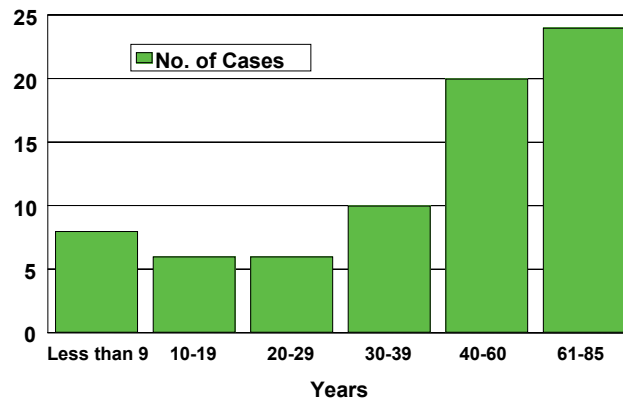
Incidence Rates per 100,000 Population and Number of Cases of Tetanus* English-speaking Caribbean and Suriname, 1997 - 2001



Source: MOH Reports to EPI/CAREC

* Excluding neonatal tetanus

Distribution of Tetanus Cases* by Age English-speaking Caribbean and Suriname, 1997 - 2001



Source: MOH Reports to EPI/CAREC

* Excluding neonatal tetanus

Tetanus prone wounds cannot all be prevented because of the ubiquitous presence of the spores. However, appropriate prevention and management should minimize morbidity or mortality. Each country should ensure that guidelines are in place for the use of the vaccine and immunoglobulin for tetanus prevention.

It is essential to convince health workers, especially medical practitioners, that tetanus toxoid can be given safely to pregnant women, whatever their stage of pregnancy. Cases of tetanus have occurred especially in high-risk localities where routine services may be absent. Every opportunity should be taken to immunize hard-to-reach groups, preferably using Td vaccine for adults.

10. Smallpox

Following the 11 September 2001 terrorist attacks in the United States, and the awareness of the potential threat from the deliberate use of smallpox virus as a biological weapon, PAHO convened a consultation meeting in December of 2001. This consultation meeting examined the current and future challenges posed by the potential threat and examined the preparedness of the Region to respond appropriately, including the potential for Regional production of smallpox vaccine that would meet present regulatory requirements. Current global availability of vaccines was reviewed and opportunities for new manufacturing were discussed. It was agreed that only strains of demonstrated safety and efficacy should be used. The decision to produce smallpox vaccine should be based on the economic and production capacity aspects. Production should not hamper current production of EPI and other essential vaccines. The consultation meeting recommended that countries review and strengthen their surveillance and diagnostic capabilities for rapid detection, investigation and response to a single case or outbreak of smallpox.

The conclusions and recommendations of the consultation meeting were brought to the attention of the September 2002 Pan American Sanitary Conference, which approved a resolution that indicated *“all countries should consider any outbreak of smallpox as a threat to the Region and the World. Countries should report promptly any suspected cases that may occur, and be prepared to provide any necessary emergency assistance, including vaccine, to contain the outbreak as rapidly as possible”*.

IV. Financial Analysis of 2003 National Work Plans

All countries have presented and discussed their 2003 National Work Plans, outlining all the technical components and activities, including the cost per activity and area of action. The total cost for the EPI in the English-speaking Caribbean and Suriname for 2003 is in the order of US \$ 15,162,570 of which 95% 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 consider carefully salaries of personnel for the routine delivery of immunization services in their estimates. **There is no significant change in the total cost of planned activities, however the costs associated with the purchase of vaccine and other related supplies more than doubled from US \$1.4 million in 2001 to US \$2.9 millions for 2002**, all from the national governments.

This dramatic increase in the Biologicals and Logistics line item in a flat program budget calls for EPI managers to carefully review this budget and advise CAREC if the figures provided are correct for the year 2003 by 31 January 2003.

National Funds	US \$	14,508,210
PAHO – Regional	US \$	338,150
PAHO – Country	US \$	105,510
UNICEF	US \$	200,700
OTHER	US \$	10,000
TOTAL	US \$	15,162,570

Funds from external agencies are being requested for the following areas of action:

Biological and Logistics	US \$	150,250
Cold Chain	US \$	91,970
Training	US \$	142,100
Social Mobilization	US \$	89,340
Operating Costs	US \$	81,000
Supervision	US \$	9,200
Surveillance	US \$	38,800
Research	US \$	30,500
Evaluation	US \$	21,200
TOTAL	US \$	654,470

V. Caribbean Surveillance Award

An annual Surveillance Award has been established to recognize countries that have performed outstandingly in their surveillance component of the program during the previous year. The Award is based on two main criteria: On time reporting and percentage of sites reporting, and the analysis was based on data received at CAREC.

The Award consists of a certificate and the inscription of the name of the country on a plaque that will be 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.

For 2002, the country receiving the Award was Grenada. Awards for second and third place went to Montserrat and Jamaica. In addition, the following countries received special recognition awards for their efforts in improving different aspects of their Fever & Rash surveillance system: Antigua/Barbuda and Cayman Islands for maintaining surveillance indicators, and St. Lucia for improvement in MESS.

Participants at the 19th Caribbean EPI Managers' Meeting congratulate these countries for being the recipients of awards and extend their compliments to all their health workers for such outstanding performance.

The 20th EPI Managers' Meeting will be held in Curacao, N.A. in November 2003.