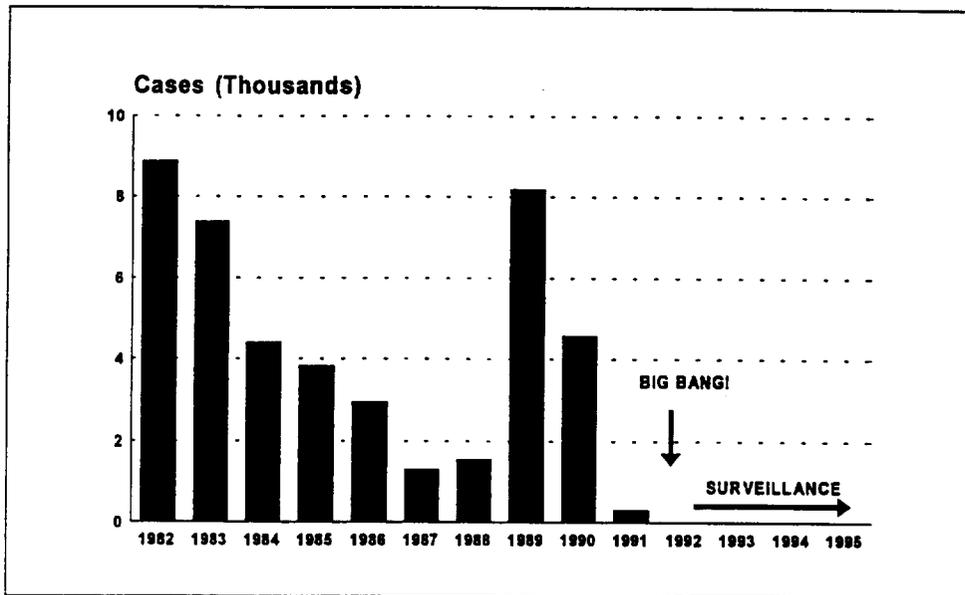


PN-ABY-367
ISBN 9592 E

TWELFTH MEETING OF CARIBBEAN EPI MANAGERS

FINAL REPORT
San Juan, Puerto Rico
13-16 November 1995

MEASLES CASES, 1982-1995
ENGLISH-SPEAKING CARIBBEAN



Source: Country Reports to CAREC
BIG BANG - 1991 Mass Vaccination Campaign 9 mo.-14 yrs.

Pan American Health Organization
Pan American Sanitary Bureau • Regional Office of the
World Health Organization

Washington, D.C.

1995

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I. Introduction

The Twelfth Meeting of the Caribbean EPI Managers was held in San Juan, Puerto Rico, from 13-16 November 1995.

Participants at the Meeting were welcomed by Dr. Carmen Deceda, Epidemiologist and EPI manager at the Secretary of Health of Puerto Rico. The event was officially inaugurated by the Honorable Secretary of Health of Puerto Rico, Dr. Carmen Feliciano de Melecio. Dr. Beryl Irons, EPI manager at the Ministry of Health in Jamaica chaired the Meeting and Dr. Ciro de Quadros, Director of PAHO's Special Program for Vaccines and Immunization (SVI) and Mr. Henry Smith, PAHO's Immunization Officer for the English-speaking Caribbean and Suriname, served as Secretaries.

The Meeting was attended by over 80 participants from the 19 countries of the English-speaking Caribbean and Suriname, as well as by representatives of the French Departments of Guadeloupe and French Guyana, as Curaçao and Puerto Rico. Present were also official representatives of Canada, England and the United States, from the Centers for Disease Control and Prevention (CDC), and immunization officers from Miami and New York city. Rotary International and the Christian Children's Fund were also in attendance. Finally, technical personnel from PAHO and its Caribbean Epidemiology Center, as well as UNICEF were active participants at the Meeting.

II. Objectives of the Meeting

The Meeting's main objective was to review the progress of the EPI program in the Caribbean and to identify obstacles which might impede achieving its targets. Country reports and the 1994 National Work Plans were reviewed and analyzed, and the 1995 National Work Plans were elaborated.

The activities related to the elimination of measles were evaluated, with special focus on surveillance issues, such as case definition, outbreak prevention and laboratory diagnosis. Similarly to the discussion held in 1994, a major issue continues to be the build-up of susceptibles in the various countries and the actions that need to be taken to prevent this build up. The maintenance of the absence of wild poliovirus transmission in the Region was discussed and different strategies for the control and elimination of rubella were debated.

III. Conclusions and Recommendations

Despite intensified surveillance for measles with over 600 units reporting each week on the presence or absence of suspected measles cases, evidenced by the improvements of surveillance indicators, over four year have now elapsed since the last laboratory confirmed case of measles was detected in the English-speaking Caribbean and Suriname.

Immunization coverage levels remain high throughout the Caribbean for all the vaccines included in the EPI Program and the majority of countries have now introduced the MMR vaccine.

Governments continue to prioritize immunization activities and are allocating resources which have covered approximately 90% of the costs of the Program over the last few years. The support of international agencies was also noted as an important factor in the progress achieved thus far. Contrary to previous years, the participation of agencies other than PAHO and UNICEF was limited to one representative of the Christian Children Fund and another from Rotary International. Strong participation of non-governmental organizations will be critical to ensure that immunization coverage is increased and that the current status of measles freedom is maintained; their continued support was considered to be fundamental for further gains.

Of major concern is the continued build-up of susceptibles, particularly among the 1-5 year age group. This build-up of susceptibles may trigger an epidemic should the measles virus be re-introduced. Some countries have already decided to implement a follow-up measles vaccination campaign directed at this age group, aimed at preventing an eventual outbreak, regardless of previous vaccination status.

1. Immunization Coverage

Immunization coverage was maintained at previous high levels (See Figure 1). However, some countries reported that coverage had either dropped or remained stationary under the 90% mark. Coverage levels of less than 95% indicate that there are considerable numbers of unvaccinated children. It was also suggested that countries using Tetanus Toxoid should start using this toxoid combined with diphtheria toxoid, in the form of dT. This measure will help ensure high levels of diphtheria coverage, particularly now that outbreaks of this disease are occurring in Eastern Europe and already one outbreak has occurred in Ecuador.

2. Poliomyelitis Eradication

The International Commission for the Certification of Poliomyelitis Eradication declared the Americas polio-free in September, 1994. Although great progress has been made towards the global eradication of wild poliovirus, circulation continues in various parts of Africa and Asia. Until global eradication is achieved, the English-speaking Caribbean and the remainder of the Region of the Americas will continue to be at risk for importations of wild poliovirus.

The following recommendations are made to maintain this polio-free status:

- a. Immunization levels of at least 80% must be maintained in every district or parish of every country.

- b. Weekly negative reporting must be maintained from all reporting sites.
- c. The timely and complete investigation of acute flaccid paralysis (AFP) in children under 15 years of age must be continued.
- d. **One** adequate stool specimen per AFP cases is now considered sufficient for virological analysis (refer to October 1995, issue of *EPI Newsletter*). To be adequate, the stool sample must be:
 - collected within 15 days of paralysis onset;
 - a quantity of about one "thumb size".

During transport, the sample must be kept refrigerated at all times (see field guide for additional details).

- e. It is **not** necessary to routinely collect stool samples from contacts of cases. If for any reason (e.g. death or loss to follow-up), adequate stool samples are unable to be collected from AFP cases or the epidemiological investigation raises strong suspicion of polio transmission, then efforts should be made to obtain contact stool specimens.

3. Measles Elimination

3.1 Caribbean Measles Surveillance Review

The clear message of measles surveillance in the English-speaking Caribbean and Suriname for the period 1992-1994, coming out from the Caribbean EPI Managers Meeting, is that there has been **no documented indigenous measles transmission** despite intensive surveillance and the investigation of 888 suspected cases. The last confirmed case was in Barbados in 1991.

The main data sources for surveillance are disease reports (from doctors, nurses, health centers and hospitals), laboratory data, population data and vaccination coverage. The disease surveillance system is not straightforward as it requires laboratory diagnosis and the sending of specimens to the Caribbean Epidemiology Center (CAREC). Flexibility is good: the system can accommodate modified case definitions, and rubella and dengue can also be captured.

A key aspect of surveillance is the sensitivity of the system, i.e. the percentage of true positives correctly identified. This requires a gold standard, which currently does not exist. Another parameter that may be examined is the number of cases per unit population. **Figure 2** shows the average annual rate per 100,000 population of suspected

measles by country. This is the first time in history that data are available on the incidence of suspected cases of measles, in the absence of measles transmission.

Montserrat had the highest rate (23/100,000), due in part to five cases in 1992. Seven countries had rates clustered in the range of 11-14 per 100,000. Another nine countries had rates in the range of 3-5 per 100,000. The first group of countries and Montserrat, therefore, appear to have more sensitive surveillance systems. The latter group including Guyana, Suriname and Jamaica did not use MMR in their 1991 mass campaigns, and thus may have been expected to have had higher rates of suspected measles. These countries may have used different case definitions for the reporting of suspected cases, which could have affected the rates and underlines the need for standardized reporting by every country to allow for international comparisons.

During the three years, a pattern of higher rates was observed at the beginning of the year, which coincides with the tourist high season. The lowest rates occurred in August, which is the period when many staff are on holiday. Subsequently, rates then increased in the latter part of the year, coinciding with the rainy seasons and increased dengue fever activity in many countries.

The Caribbean measles surveillance system has an adequate representation in the public sector; this is not the case among private doctors. There is also a 100-fold variation in the number of reporting sites per 100,000. Timeliness was considered adequate: 94% of reports were received within one week of rash onset.

Surveillance systems do not run themselves: people run them. Thus, if dysfunctional relationships exist, where, for example, the epidemiologist does not communicate with the laboratory director, then surveillance will be compromised. Likewise, problems will arise if health providers fail to provide date of onset and/or date of collection of laboratory specimens. In 1995, to date, 40% of the 274 specimens submitted to CAREC omitted date of onset and/or date of collection.

During the 1994-1995 period, 541 suspected measles cases were reported and **none was confirmed by a laboratory**. Of these, 403 were discarded, 84 are still under investigation, 53 were clinically confirmed with no blood collected for laboratory confirmation. Of the discarded cases, 79 were rubella, 19 were dengue and 308 were negative for measles, rubella and dengue (See Figure 3).

In 1995 to date, 300 suspected cases of measles have been reported. Of these, 274 (91%) had a first blood sample sent to CAREC and 110 had a second sample. Fifty did not require a second sample. No cases of measles were confirmed by laboratory during this period. Forty eight (17.5%) were discarded as rubella, and nine (3.3%) were diagnosed as dengue fever.

- * The measles surveillance system in the English-speaking Caribbean is in satisfactory condition, but vigilance must be maintained. The challenges in surveillance are now those of surveillance of a rare disease: many doctors and nurses have never seen a case. If transmission has been eliminated, then importation is the only way that measles can re-emerge, and only if there are susceptible populations. Ten million tourists visit the Caribbean every year, and Caribbean people also travel substantially. Therefore, there is a **need for better international surveillance in areas of the world where measles is still occurring.**
- * Given that imported cases are most likely to be seen by the private sector, there is a **pressing need for innovative ways to include the private sector in reporting.**
- * Regarding sensitivity, once a standardized case definition is used by every country, those countries with annual rates of suspected cases of <math>< 10/100,000</math> should examine their surveillance systems to improve the detection of suspected cases.
- * The continuing problem of poor documentation, when specimens are submitted, points to the need for very basic training of health professionals, to reiterate the importance of collecting these data. PAHO/CAREC should prepare guidelines on the subject, to be disseminated among all doctors and medical schools in Member Countries.
- * Finally, monitoring the build-up of susceptible populations and promoting an aggressive response to eliminate the susceptibility of these groups will become key components of the Caribbean's measles elimination surveillance strategy.

3.2 Case Definition

The overall purpose of measles surveillance is to promptly detect the transmission of the measles virus in a county. Once transmission has been detected, the surveillance system allows for the efficient investigation of the resulting measles cases. The investigation of a measles outbreak will allow causative factors for measles transmission to be determined.

In an effort to improve the quality and timeliness of measles surveillance, the following recommendations were made to simplify definitions used for case investigation and classification:

The measles elimination program focuses on detecting all cases for which clinician or a trained health care worker suspects measles diagnosis and/or those cases meeting the clinical case definition of a **SUSPECTED MEASLES CASE**. Following a complete investigation, suspected cases are then classified as either **CONFIRMED** or **DISCARDED**. While the program aims to have all reported cases laboratory confirmed, if for lack of complete investigation and laboratory data, cases diagnosed as clinical measles will be

considered as **CLINICALLY CONFIRMED**. The category of "**clinically confirmed**" cases represents, therefore, a failure to appropriately investigate suspected cases. Every effort must be made to ensure that all suspected cases are fully investigated so that ideally no cases will fall into this category.

Investigation of all suspected cases should begin within 48 hours of notification. Once the epidemiologic investigation has been completed, a final classification should be made within 4 weeks.

Revised Measles Surveillance Case Classifications

I. Suspected Measles Case

1. **ANY PATIENT IN WHOM A TRAINED HEALTH WORKER SUSPECTS MEASLES**
2. **PATIENT WITH:**
 - Fever
 - and
 - Generalized maculopapular rash
 - and
 - At least one of the following signs:
 - Cough or Coriza or Conjunctivitis

II. Confirmed Measles Case

A. LABORATORY CONFIRMED case is a suspected case with 1 or more of the following:

- 1. *Laboratory* confirmation
- 2. *Epidemiologic* linkage to another laboratory confirmed case

1. **Direct Laboratory Confirmation:**

A suspected case can be Confirmed if **the presence of anti-measles IgM antibodies has been detected in a serum specimen collected within the first 28 days following rash onset**. In outbreaks with several suspected cases it is not necessary to take blood samples from every person. Only the first 3 to 5 cases should have blood drawn for laboratory confirmation. All of the other cases can be confirmed if they meet the case definition and are epidemiologically linked to another laboratory confirmed case.

2. Indirect Laboratory Confirmation:

Epidemiological linkage or contact with a recent Laboratory Confirmed case whose onset of rash was within 21 days before the present case.

B. CLINICALLY CONFIRMED

These cases satisfy the clinical case definition for a suspected measles case, but for one reason or another, a laboratory investigation is not conducted and an epidemiological link is not found. Although the final diagnosis of these cases is not known for surveillance purposes, they are classified as Clinically Confirmed measles. These cases result from incomplete case investigations of suspected cases. As the surveillance system matures, relatively few cases will be classified as Clinically Confirmed. These cases are considered failures of the surveillance system.

III. Discarded (Not Measles)

If laboratory evidence is obtained that another infection associated with a rash illness was present, then the case is discarded. A case is also discarded if the results from an adequate laboratory specimen (collected within the first 28 days following rash onset) is negative for measles infection. It is known that the sensitivity of the IgM serology test is less than optimal in the first two days of the rash. This may result in some false negative results, still it will improve the probability of increasing collection of specimens from suspected measles cases that otherwise may be lost to follow-up.

3.3 Laboratory Testing

The Capture IgM EIA test is the assay of choice for confirmation of suspected measles cases. The test has a very high sensitivity for specimens collected within the first 28 days of rash onset and a somewhat lower sensitivity within the first two days of rash onset. For elimination purposes, one specimen collected within the first 28 days of rash onset is considered sufficient for diagnosis. To assure a higher rate of collection of laboratory samples, a blood specimen should be collected when a patient visits a health facility, even if this occurs before the third day of rash. On occasions, a second specimen from those patients that have a specimen collected before the third day of rash may be requested.

ALL SPECIMENS SUBMITTED TO THE CAREC LABORATORY MUST HAVE AN EPI NUMBER AND BE ACCOMPANIED BY A COMPLETED "REQUEST FOR VIROLOGICAL INVESTIGATION" FORM.

3.4 Build-up of Susceptibles

The current strategy for measles elimination consists of four distinct steps:

- a. Conducting an initial national or multinational measles mass campaign designed to reach all children between 9 months or 1 year of age through 14 years of age, regardless of disease or vaccination history; sometimes referred to as a "Big Bang" or "Catch-up" campaign. "Mop-up" activities (ranging from holding special community clinics, to providing door-to-door immunizations) for any area or sub-group missed by the mass campaign.
- b. An intensification of surveillance for measles disease from both public and private health providers, including timely reporting, rapid investigation of suspected cases, and the collection of specimens for laboratory testing.
- c. Strengthening of vaccination activities as part of the routine health services, including monitoring population coverage levels at the smallest geographic level.
- d. The implementation of periodic national "follow-up" mass campaigns to eliminate the build-up of susceptibles. The time interval between campaigns will depend on the time necessary to build-up susceptibles equivalent to the size of one birth cohort. This is usually between the ages of 5 and 6 years old. In the English-speaking Caribbean, this is usually the "follow-up" campaign, immunization is provided regardless of previous disease or vaccination history.

Virtually all countries in the Caribbean, as well as in Central and South America have already implemented the first three steps of the above strategies. The fourth step, the "follow-up" mass campaigns, has been conducted by Cuba, Belize, Brazil, and Peru, and was being implemented in Jamaica and Guatemala at the time this report was issued. Follow-up campaigns are being planned by almost all countries in Central America, as well as Chile in South America.

An analysis of the number of susceptibles within the English-speaking Caribbean was updated during this Meeting (see Table 1). By May 1996, five years since the "catch-up" campaign, there will be approximately 25% (107,000 children) of the 1 through 5 age range susceptible to measles in the English-speaking Caribbean and Suriname, excluding Jamaica and Belize, (which are now conducting "follow-up" campaigns.) A sero-survey conducted in Jamaica in 1995, showed that sero-negative rate among vaccinated individuals averaged 15%. If these data are similar in other countries, the pool of susceptibles may be even larger

than estimated. It is thought that such a number of susceptibles are more than sufficient to support a considerably large epidemic should a measles re-introduction occur.

With this background, it is imperative that "follow-up" campaigns targeting all children 1 through 5 years of age be conducted in all those countries that have not yet done so. These "follow-up" campaigns should be conducted in 1996, and their impact would be greatly enhanced if conducted simultaneously by all countries.

3.5 Outbreak Response

In the countries that have implemented the measles elimination strategy, including a "follow-up" campaign, the detection of a suspected measles case should result in improved surveillance and careful case investigation, with a rapid assessment of the level of vaccine coverage and of the need to carry out mop-up activities. The implementation of special control immunization campaigns are of limited benefit once an outbreak has started. However, once a suspected or confirmed case has been detected, all contacts 1 to 14 years of age who do not have evidence of vaccination should be immunized.

3.6 Improving Reporting

To enhance surveillance activities it is necessary to broaden the surveillance "net", so that a wider number of suspected measles cases are reported. It was proposed that pediatricians and other private medical providers participate more actively in the surveillance system. Suggested activities include:

1. To meet with pediatricians, especially those who are likely to come in contact with patients who are considered to be high risk, (either because of migration, geographic location, or tourism), and discuss their recent experience with rash and fever illnesses, in general, and measles in particular. Also, to determine whether they are familiar with the procedures for reporting suspected measles.
2. To visit and meet with staff at public clinics to discuss their approach for involving private providers.
3. To hold periodic meetings with local medical associations to explain the program and elicit their support.
4. To provide incentives, such as vaccine and diagnostic laboratory results for cooperation and participation in the surveillance system.

3.7 Measles elimination in Canada, the United Kingdom and the United States

Activities towards the elimination of measles in Canada and the United States (including review of the activities conducted in Miami and New York City) were reviewed during the meeting.

a. Canada

As the incidence of measles has fallen, the limitations of Canada's one-dose program have become apparent. Measles transmission continue to occur, between outbreaks even among populations with virtually 100% documented vaccination. Canada has achieved 97% MMR vaccine coverage among 2 year olds. However, there are outbreaks which involve 1 to 5% of school-aged children and spill over into the pre-school group. To date, competing developments in childhood vaccination programs have preempted the formal introduction of two-dose measles programs in Canada.

Canada enjoyed its lowest level of measles activity in 1993, with only 204 cases reported. This number has risen steadily to reach 2,218 so far in 1995. This represents nearly 50% of all cases reported to date in the Americas. Analysis of the situation suggests that a major measles outbreak may occur as early as April 1996. There is a clear need for action on measles.

By itself the introduction of a routine second dose of MMR to young children will not eliminate measles for 10-15 years. The most efficient way to avoid future outbreaks and eliminate measles by the year 2000 is to implement a blitz "catch-up" vaccine campaign over a short period, followed by the implementation of a routine two-dose program. Cost-benefit analysis has shown that the benefits of such a program far outweighs its costs. Therefore, Health Canada is encouraging a mass "catch-up" vaccine campaign followed by a routine two-dose schedule.

Plans are currently being developed for the mass "catch-up" campaigns involving all school-aged children by the largest provinces, representing nearly 75% of the target population. These campaigns are likely to start as early as February 1996. Furthermore, during next year all provinces are likely to implement a routine second MMR dose administered at either 18 months or school entry.

b. United Kingdom

Since 1940, measles has been a statutory notifiable disease for which doctors are obliged to report all clinically suspected cases. This provides reliable trend data, but individual notifications are not reliable. Recent experience has shown that in periods of low prevalence,

less than 15% of notified cases in the under 5 year-old age groups are correctly diagnosed. On the other hand, cases are correctly diagnosed when occurring among older children, especially those in local outbreaks.

Since 1986, there has been age-specific serosurveillance data, available annually. This has provided an early warning of the accumulation of sufficient susceptibles to sustain a significant measles epidemic, and has supported the need for a national immunization campaign, similar to the one held in the English-speaking Caribbean.

In 1994, a new system for measles case confirmation was introduced nationally, employing the detection of measles-specific IgM in saliva specimens. This has demonstrated to be highly sensitive and specific. Additionally, measles virus genome identification in blood or urine samples is also available nationwide.

Since the measles immunization campaign, conducted in November 1994, measles notifications have fallen to historic low levels. Only 3 cases of measles have been confirmed in children aged 5 to 16 years; they had not been immunized during the campaign. Most of the few remaining confirmed measles cases have been among adults. During 1995, around 15% of confirmed cases have been importations. Each month, close to 60% of notified cases are investigated by saliva sampling. Presently, less than 1% of tested cases are positive for measles IgM. Nationally collected age-specific sero surveillance demonstrates a dramatic decline in measles susceptibility in the age groups covered by the campaign - from 11% before the campaign, in children aged 5 - 15 years, to 3% afterwards. The campaign has been an outstanding success in preventing a measles epidemic and in advancing the country's goal of measles elimination. The next step will be to introduce a strategy to prevent the re-accumulation of susceptibles; this is presently under consideration.

c. United States

Measles has become a rare disease in the United States. During 1993, the total number of cases reported was 312, a rate of 1.2 per million population, the lowest annual total ever. Although 963 cases were reported in 1994, only 279 cases have been reported through November 10, 1995. Two lines of evidence suggest that measles transmission was interrupted late 1993 in the United States.

Over an 11-week period only one indigenous case that could not be linked to an imported case was reported; no indigenous cases were reported for a 4-week period. Furthermore, for a six-week period, a single case occurred without indigenous transmission. Genetic sequencing of measles virus strains isolated from measles cases also supports the notion of interrupted transmission. Strains isolated from 1989 through 1992, all shared a similar genetic pattern. Since 1993, none of the isolates from the United States have had a genotype similar to the one from 1989-1992, suggesting that transmission of the 1989-1992 strain has been interrupted.

The United States strategy for measles elimination is based on similar concepts to the strategy being implemented in the Caribbean: maintaining high levels of population immunity and preventing the accumulation of susceptible persons, enhancing surveillance, and responding to outbreaks with intensified surveillance. Surveillance of imported cases in the United States has shown that the elimination activities undertaken in the countries of the Americas have profoundly influenced the epidemiology of measles in the United States. Before 1991, the Americas accounted for a larger proportion of importations than any other region of the world. Since 1991, the total number of importations into the United States has fallen by about half; this decline is solely the result of fewer importations from the Americas. In 1994, there were only 6 suspected importations from the Americas and none confirmed during 1995 so far.

In Miami, a city with close ties to the Caribbean, measles control activities have been similarly successful. Preventing outbreaks and intensive surveillance have been the priorities since the mid-1980's. Vaccine coverage levels among 2-year old children have risen steadily since 1987, to reach current levels approaching 95%. Because of the large number of cases among infants during 1986, a policy was implemented of vaccinating children at 6 months of age with the measles vaccine, and re-vaccinating them with the MMR vaccine at 15 months of age. During 1994 and 1995, no cases of measles were confirmed despite the investigation of over 200 suspected cases.

In New York City, the epidemic of measles that occurred during 1990 and 1991, has been followed by a period of very low incidence. Vaccine coverage level among 2-year old children is now estimated to be 88%, and school laws assure that all children are vaccinated with two doses of MMR by age 5 or 6. An active surveillance system has documented that an increasing proportion of cases are being identified as importations. Of the 5 confirmed cases reported during 1995, 3 were importations and 2 could not be linked to importations. The source countries for the 3 importations were China, Germany, and Belgium.

4. Rubella Control/Elimination Strategies

Laboratory testing of specimens for rubella from the rash and fever surveillance system from 1990-1995, at the CAREC Laboratory indicates widespread rubella virus circulation in the Caribbean from 1990, and continuing into 1995. Rubella testing from several of the larger countries (Belize, Jamaica, Guyana and Suriname) indicates continuous rubella virus circulation for 4 consecutive years. Outbreaks occurred in 1995, in Jamaica and Guyana. A review of all rubella seroprevalence studies from the Caribbean shows that 30-50% of women of childbearing age (WCBA) are rubella seronegative. As of 1996, all countries will have rubella-containing vaccine in their routine infant schedule. All countries will try to include MMR in the measles "follow-up" mass campaign in 1996. However, a rubella/congenital rubella syndrome (CRS) prevention program limited to children under 5 year olds will not reduce CRS for many years. Therefore, to significantly reduce CRS cases within the next 5 years, the following actions should be considered to protect WCBA and to reduce rubella virus transmission:

- * Vaccinate all women of child-bearing age
- * Vaccinate as many 5-18 year old school children as possible with available resources

It is suggested to include the following components for rubella surveillance:

- * Continue to test all measles-IgM-negative cases from the measles surveillance system for rubella Igm
- * Begin a congenital rubella syndrome surveillance system. Try to capture the 50% of CRS cases that may occur 0 to 12 months old with deafness alone.
- * Begin rash and fever in pregnancy surveillance

5. Missed Opportunities to Vaccination

Trinidad and Tobago presented a study on missed opportunities for vaccination. As similar studies in other countries of the Americas have shown, opportunities to vaccinate children are often missed when they visit health facilities for treatment. Generally, these opportunities are missed due to false contraindications (usually mild illnesses.) This study re-emphasizes the need for health care providers to use every opportunity to vaccinate children.

It is suggested that similar studies be conducted in other Caribbean countries to ascertain the level of missed opportunities and the application of corrective actions if warranted.

6. Social Mobilization

Continued Social Mobilization and NGO involvement are essential to the goals of the EPI, namely improving coverage and maintaining the eradication of polio and eliminating the transmission of measles. With regard to measles social mobilization, it is critical to increase the population's awareness on the need to immediately take children of any age to a health facility when rash and fever occur.

The importance of continued NGO involvement, as well as the development of new links with NGOs was stressed.

IV. Financial Analysis of 1996 National Work Plans

All countries have presented and discussed their 1996 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 1996, is in the order of US\$8.7 million. Of this amount, 83% 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 external agencies were not committed as of the date of the Meeting, this will require further negotiations at the country level.

National fund	US\$ 7,208,550 (83%)
PAHO	405,300
CPHA BILATERALLY	23,600
UNICEF	935,400
Rotary International	80,100
Other	50,500
TOTAL	8,703,450

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

Biological and Logistics	US\$ 1,535,400
Cold Chain	428,900
Training	240,200
Social Mobilization	353,100
Operating Costs	5,659,950
Supervision	108,850
Surveillance	185,850
Research	121,400
Evaluation	69,800
TOTAL	US4 8,703,450

V. Future Meeting Plans

The next meeting will be held in November, 1996. Note was taken of the offers made by the representatives of Belize, Guyana and that of the British Virgin Islands made in 1994 to host the 13th Meeting the Caribbean EPI Managers.

Table 1
 Estimated Number of Children Under 6 Years of Age
 Susceptible to Measles, CAREC Member Countries
 (Based on 5 cohorts born between June 1990 and May 1995)

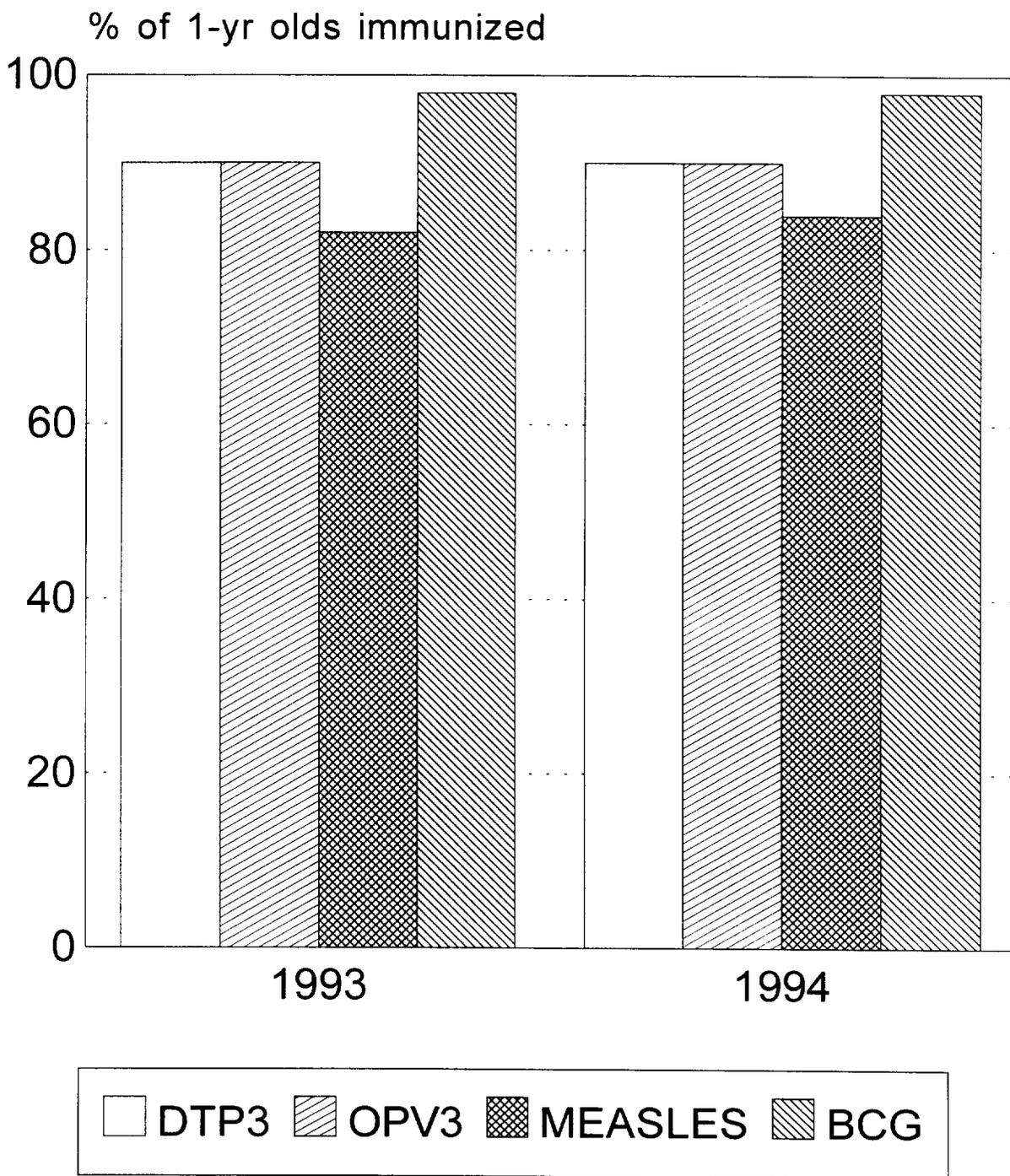
Country	Annual Births	Percent Not Vaccinated	Projected Susceptible < 6 Years Age*
Anguilla	159	0	80
Turks & Caicos	286	10	286
Montserrat	186	0	93
British V. I.	320	1	176
Cayman Islands	550	2	330
St. Kitts/Nevis	1,000	1	550
Antigua/Barb.	1,284	0	642
Bermuda	954	15	1,193
Dominica	1,652	7	1,404
St. Vincent/Gr.	2,640	9	2,508
Grenada	2,372	13.5	2,787
St. Lucia	3,690	15	4,613
Belize	7,781	20	11,672
Bahamas	6,500	9	6,175
Barbados	4,097	9	3,892
Suriname	9,000	26	16,200
Guyana	21,344	20	32,016
Trinidad & Tobago	23,000	20	34,500
Jamaica	60,000	29	117,000
TOTAL	149,346	--	236,117
TOTAL EXCLUDING BELIZE, JAMAICA	81,565	--	107,445

* Projection based on 10% vaccine failure and the percentage unvaccinated for 5 births cohorts.

Coverage EPI Vaccines, 1993-1994

English-Speaking Caribbean and Suriname

Figure 1

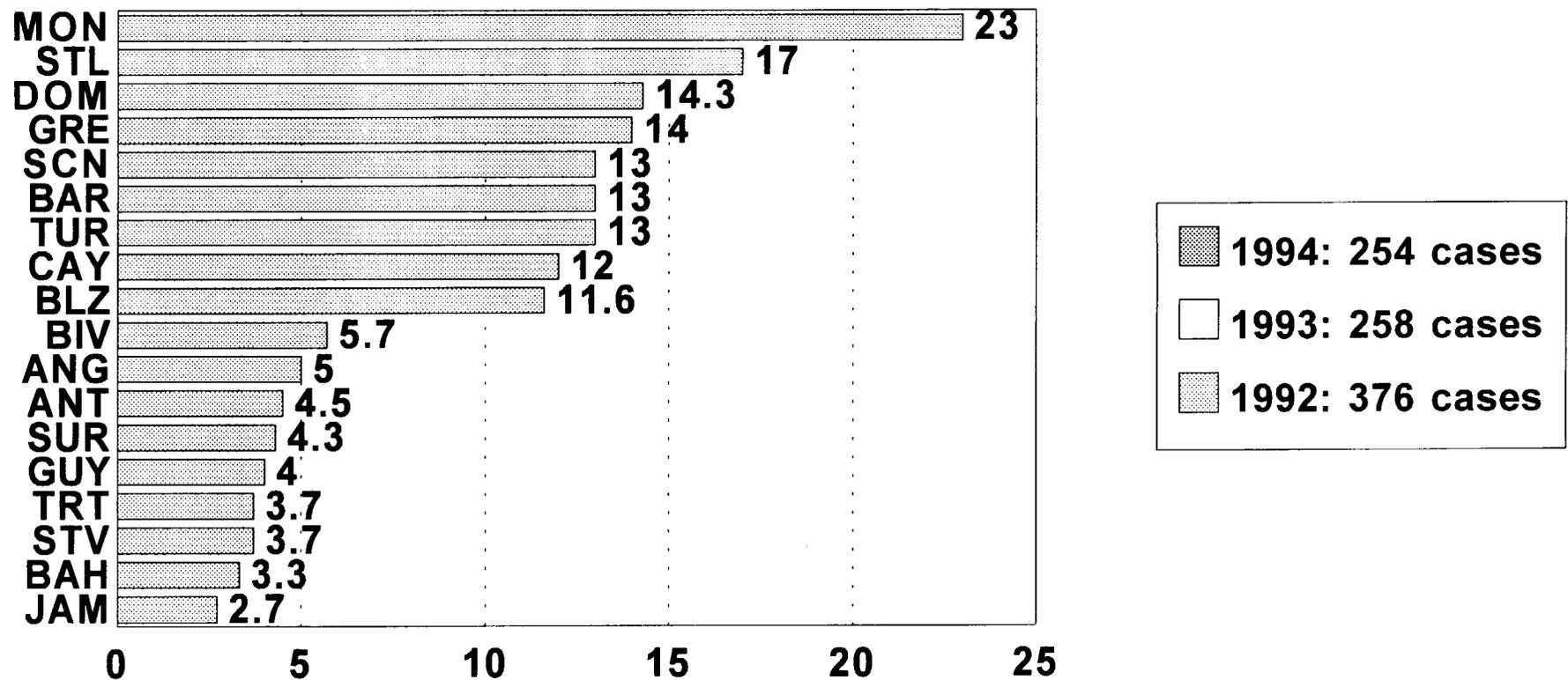


Source: Ministries of Health
1995

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Average Annual Rate* of Suspected Cases of Measles by Country, 1992-1994

Figure 2

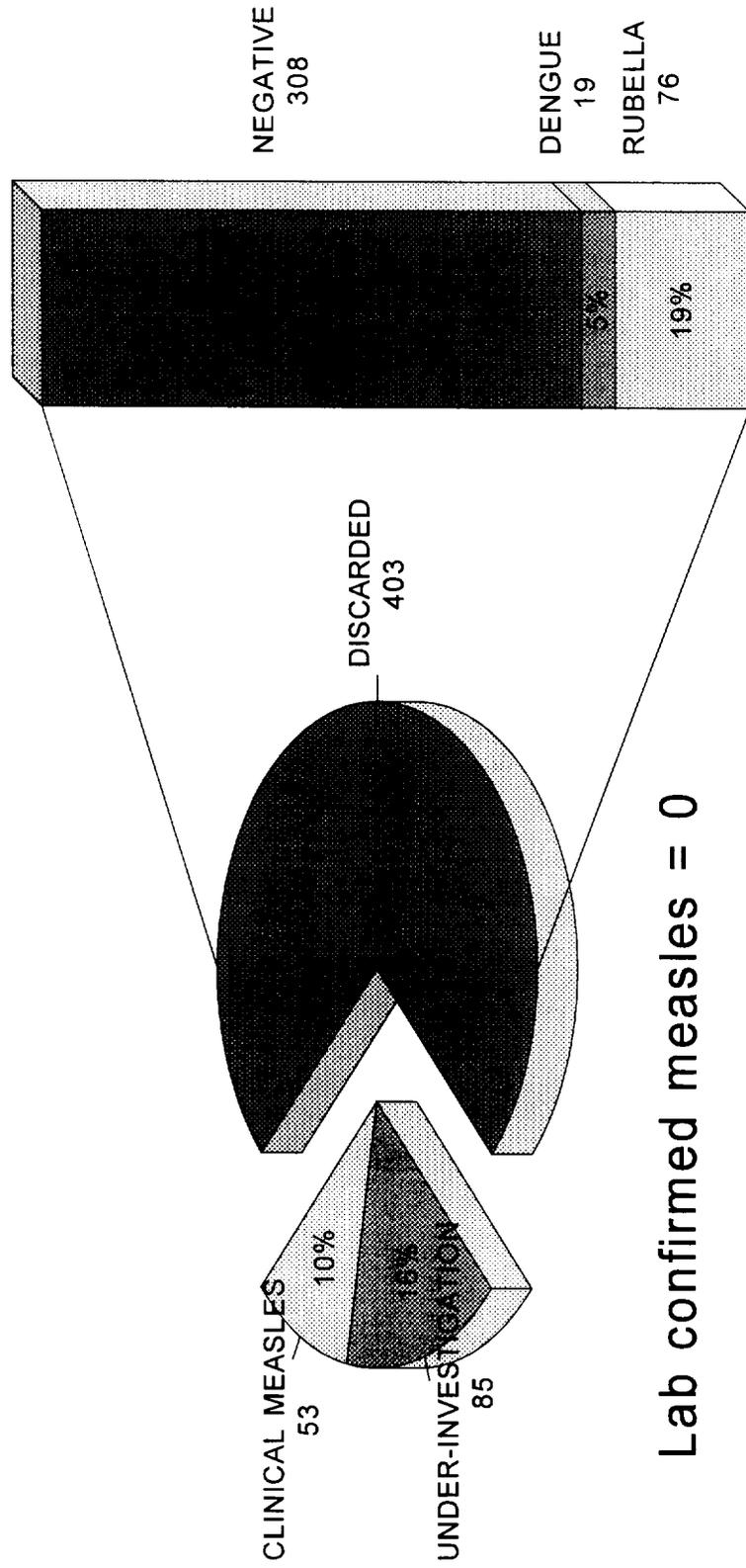


* Cases per 100,000 population

2

Classification of Suspected Measles Cases n=541, English-Speaking Caribbean, 1994-95

Figure 3



**PAN AMERICAN HEALTH ORGANIZATION
WORLD HEALTH ORGANIZATION
12TH CARIBBEAN EXPANDED PROGRAMME
ON IMMUNIZATION (EPI)
MANAGERS' MEETING**

NOVEMBER 13-16, 1995

LIST OF PARTICIPANTS

SAN JUAN, PUERTO RICO

20

ANGUILLA

Ms. Marvella Georginia Richardson

Public Health Sister/EPI Manager

Ministry of Social Services

Valley Health Centre

The Valley

Tel: 1-809-497-2702

Fax: 1-809-497-5745

ANTIGUA

Ivy-Jean Benjamin

Superintendent Public Health Nurses/

EPI Manager

Ministry of Health & Home Affairs

St. John's Health Centre, Medical Division

St. John's

Tel: 1-809-462-4739

Fax: 1-809-462-5003

BARBADOS

Dr. Elizabeth Ferdinand

Senior Medical Officer/EPI Manager

Ministry of Health & the Environment

Jemmotts Lane

St. Michael

Tel: 1-809-427 8326

Fax: 1809-426-5570

Ms. Hermione Chase

Chief Public Health Nurse

Ministry of Health & the Environment

Jemmotts Lane

Bridgetown

Tel: 1-809-426-5080

Fax: 1809-426-5570

BAHAMAS

Ms. Bernadette Godet

EPI Coordinator
Ministry of Health & Environment
P.O. Box N 1096
Nassau
Tel: 1-809-325-0620
Fax: 1-809-325-3061

Dr. Evaneth McPhee

Medical Officer of Health/EPI Manager
Ministry of Health & Environment
Public Health Department
P.O. Box 3730
Nassau
Tel: 1-809-325-3061/322-8835
(Dept. of Public Health)
Fax: 1-809-322 7788 (Min. of Health)

BERMUDA

Ms. Diana Simons

Supervisor - Child Health
Department of Health & Social Services
P.O. Box HM 1195
Hamilton HM EX
Tel: 1-809-236-0224
Fax: 1-809-292-7627

Ms. Rhonda Daniels

Nurse Epidemiologist
Department of Health & Social Services
P.O. Box HM 1195
Hamilton HM EX
Tel: 1-809-441-292-1241
Fax: 1-809-441-292-7627

BELIZE

***Ms. Malva Bood Allen**

Ag. Supervisor Public Health Nurses/
EPI Manager
Matron Roberts Health Centre
Ministry of Health
P.O. Box 273
Belize City
Tel: 01-501-2-77170/76
Fax: 01-501-2-30117

Ms. Emeliana Osorio

Ag. Senior Public Health Nurse
Matron Roberts Health Centre
Ministry of Health
P.O. Box 273
Belize City
Tel: 01-501-2-77170/76
Fax: 01-501-2-30117

***Mr. Anthony Nicasio**

Director, Health Education & Community
Participatin Bureau (HECOPAB)
Cleopatra White Health Center
P.O. Box 493, Belize City
Belize C.A.
Tel: 01-501-2-44259
Fax: 01-501-230117

BRITISH VIRGIN ISLANDS

Ms. Althea Kellman

Ag. Nursing Director
Community Services
Ministry of Health & Welfare
Box 439 Road Town, Tortola
Tel: 1-809-494-5269
Fax: 1-809-494-5287

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CAYMAN ISLANDS

Ms. Florence Alice Ebanks
Senior Public Health Nurse/EPI Manager
Personal Health Services
Cayman Islands Government
P.O. Box 915 G
George Town, Grand Cayman
Tel: 1-809-949-8600
Fax: 1-809-945-2153

CURACAO

Ms. Rita Simmons-Barrow
EPI Manager
Department of Child & Youth Health
Van Leeuwenhoekstraat 15, Willemstad
Curacao
Netherland Antilles
Tel: 627-212
Fax: 627-218

DOMINICA

Ms. Virginia Austrie-Roberts
Senior Community Health Nurse/EPI Manager
Ministry of Health
Primary Health Care Centre, Upper Lane
Roseau
Tel: 1-809-448-2401/448-3479
Fax: 1-809-449-8013

GRENADA

Ms. Geraldina Perrotte
Chief Community Health Nurse/EPI Manager
Ministry of Health
St. George's
Tel: 1-809-440-2846, Ext. 265
Fax: 1-809-440-4127

GUYANA

Dr. Michelle Collins-Harris

Medical Officer of Health
(Maternal & Child Health)
Ministry of Health
Brickdam, Georgetown
Tel: 01-592-2-67338/61224
Fax: 01-592-2-56985

Ms. Joan Barry

EPI Field Officer
Ministry of Health
Brickdam, Georgetown
Tel: 592 2 67338/61224
Fax: 592 2 56985

***Ms. Clarice Watson**

EPI Field Officer
Ministry of Health
Brickdam, Georgetown
Tel: 592 2 67338/61224
Fax: 592 2 56985

***Ms. Myrtle Smith**

Senior Health Visitor (Region #)
Suddie Public Health Office
Essequibo
Tel: 592-2-074-360
Fax:

FRENCH GUIANA

Dr. Marie-Laure Gandar

Medecin Coordinateur des Actions Sanitaires
19 Rue Shoelcher
Dass-Guyane, Cayenne
Guyane
Tel: 594-31-7837 (Home)
Fax: 594-37-8066

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GUADELOUPE

Dr. Max R. Theodore

Actions de Sante-DASD
DASD Conseil General de Guadeloupe
Rue Lardenoy, 97100
Basseterre, F.W.I.
Tel: 590 81 4048 (W) 590-812658 (H)
Fax: 590 81 5946

JAMAICA

Dr. Beryl Irons

Senior Medical Officer
Maternal & Child Health
Ministry of Health
10 Caledonia Avenue
Kingston 5
Tel: 1-809-968-7829, 926-9290-9
Fax: 1-809-968-0345, 929-9649

***Mrs. Veronica Reid-Cookes**

Senior Public Health Nurse/EPI Coordinator
Public Health Department
Kingston/St. Andrew
Tel: 1-809-926-1550
Fax: 1-809-972- 2215

***Ms. Cynthia Veronica Reid**

Logistics Officer/Public Health Nurse
Expanded Programme on Immunization
Ministry of Health
10 Caledonia Road
Kingston 5
Tel: 1-809-926-8784
Fax: 1-809-968-0345

***Sponsored by UNICEF**

***Mrs. Myrtle Rose-Wright**
Supervisory Midwife
Portland Health Department
Tel: 1-809-993-2557
Fax: 1-809-

MONTSERRAT

Ms. Sarah Ryner
Admin. Sister Community/EPI Mnager
Ministry of Health
P.O. Box 24
Plymouth
Tel: 1-809-491-2552
Fax: 1-809-491-3131

PUERTO RICO

Dr. Carmen Deseda
Commonwealth Epidemiologist
Puerto Rico Department of Health
P.O. Box 70184
San Juan, P.R. 00936
Tel: 809-274-7605, 721-0165
Fax: 809-250-6547

SAINT LUCIA

Ms. Albertha Harris
Public Health Nursing Supervisor/EPI Manager
Ministry of Health
Chaussee Road
Castries, St. Lucia
W.I.
Tel: 1-809-452-2859, Ext. 313
Fax: 1-809-452-5655

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- 27 -

Dr. Debra Louisy-Charles
Senior Medical Officer (MCH/FP)
Ministry of Health
Chaussee Road
Castries, St. Lucia
W.I.
Tel: 1-809-452-7388
Fax: 1-809-453-8253

ST. CHRISTOPHER/NEVIS

Dr. Patrick Martin
Pediatrician
JNF Hospital/Ministry of Health
Connell Street
Basseterre
Tel: 1-809-465-5348
Fax: 1-809-465-1316 (MOH)

Ms. Sylvia Gwendolyn Isaac
Ag. Superintendent Community
Health Nurses
Ministry of Health
Basseterre
Tel: 1-809-465-2521, Ext. 1140/1136
Fax:

ST. VINCENT AND THE GRENADINES

Ms. Yvonne S. Labbay
Senior Nursing Officer (CH) EPI Manager
Ministry of Health and the Environment
Kingstown
Tel: 1-809-456 1111, Ext 518
Fax: 1-809-457-2684

SURINAME

Mr. Soekirman Sabiran
Ag. EPI Manager
Bureau of Public Health, (BOC)
Rode Kruislaan 22
Paramaribo
Tel: 01-597-498-564, 01-499-494
Fax: 01-597 494-941

Ms. Liu Njoek-Jin
Public Health Nurse, Epidemiology Unit
Bureau of Public Health
Rode Kruislaan 22
Paramaribo
Tel: 01-597-498-564
Fax: 01-597-494-941

***Ms. Roma Perotie**
Nurse/Health Worker
Medical Mission
Zonnebloemstraat, 45-47
Paramaribo
Tel: 01-597-499-466

***Mr. Radjindrepersad Rogstamkhan**
Nurse/Health Worker
Regional Health Service
Wanicastraat 160
Paramaribo
Tel: 01-597-483-396

***Sponsored by UNICEF**

TURKS AND CAICOS ISLANDS

Ms. Monica Wilson
EPI Manager
Ministry of Health and Social Security
Grand Turk
Tel: 1-809-946-1452
Fax: 1-809-946-2411

TRINIDAD AND TOBAGO

Ms. Hillerine M. Seaton
EPI Coordinator
Ministry of Health
10-12 Independence Square
Port of Spain
Tel: 1-809-627-0010 - 14
Fax: 1-809-

Dr. Pooran Ramlal
Ag. Principal Medical Officer
(Community Services)
Ministry of Health
10-12 Independence Square
Port of Spain
Tel: 1-809-622-2242
Fax: 1-809-623-9528

RESOURCE PERSONS:

Dr. Ciro de Quadros
Director. SVI/EPI
Pan American Health Organization
525 Twenty-Third Street, N.W.
Washington, D.C. 20037
USA
Tel: 202 861 3247
Fax: 202 861 6089

Dr. Bradley Hersh
Medical Officer, SVI
Pan American Health Organization
525 Twenty-Third Street, N.W.
Washington, D.C. 20037
USA
Tel: 202-861-3277
Fax: 202-861-6089

Mr. Peter Carrasco
Regional Technical Officer, SVI
Pan American Health Organization
525 Twenty-Third Street, N.W.
Washington, D.C. 20037
USA
Tel: 202 861 3248
Fax: 202 861 6089

Mr. Fernando Vargas
Programme Technician, SVI
Pan American Health Organization
525 Twenty-Third Street, N.W.
Washington, D.C. 20037
USA
Tel: 202 861 8497
Fax: 202 861 6089

Dr. Stephen Redd
Chief, Measles Elimination Activity
National Immunization Program
Centers for Disease Control
1600 Clifton Road, Mailstop E61
Atlanta G.A. 30333
USA
Tel: 1-404-639-8230
Fax: 1-404-639-8616

Dr. Mark Papania
Medical Epidemiologist
Centers for Disease Control
Mailstop E 61
Atlanta, G.A. 30333
USA
Tel: 404-639-8761
Fax: 404-639-8616

Dr. Sonja Hutchins
Medical Epidemiologist
National Immunization Program & Prevention
Centers for Disease Control
Mailstop E-61
Atlanta G.A. 6A 30333
USA
Tel: 404-639-8230
Fax: 404-639-8616

Dr. Susan Reef
Medical Epidemiologist
Centers for Disease Control
MS-E61,1600
Atlanta, GA 30329
USA
Tel: 404-639-8230
Fax: 404-639-8616

Ms. Anita Kimbler
Director, Immunization Program
Dade County Public Health Department
1350 NW 14, Street
Miami, Florida 33125
Tel: 305-325-2554
Fax: 305-325-3222

Mr. Peter Crippen
CDC Advisor
City Department of Health
Bureau of Immunization
311 Broadway
NY NY 10007
USA
Tel: 212-285-4617
Fax: 212-285-4611

Dr. Mac Otten
SVI/PAHO
Washington, D.C.
USA
Tel:
Fax:

Dr. Marc Strassburg
Epidemiologist, STC
Pan American Health Organization
L.A County Health Department
313 N. Figueroa Street
L.A. CA 90012
USA
Tel: 213 240 7785
Fax: 213 250 2594

Dr. David Salisbury
Principal Medical Officer
Department of Health
707 Wellington House
133-155 Waterloo Road
London, U.K.
Tel: 44 171 972 4488
Fax: 44 171 972 4468

Dr. Philippe Duclos
Chief, Child Immunization Division
Laboratory Centre for Disease Control
Ottawa, Ontario KIA OL2
Canada
Tel: 613 957 0325
Fax: 613 998 6413

Dr. Edmond Maes
Chief Epidemiology Section
Immunization Service Division
National Immunization Program
Centers for Disease Control & Prevention
1600 Clifton Road, NS E52
Atlanta Georgia 30333
USA
Tel: 404 639 8215
Fax: 404 639 8615

Dr. Ernest Pate
MCH Advisor, PAHO
CPC Office
P.O. Box 508
Bridgetown, Barbados
Tel: 809-426-3860
Fax: 809-436-9779

Dr. Greg Kirk
PAHO/STC/EPI
Pan American Health Organization
60 Knutsford Boulevard
Kingston 5, Jamaica
Tel: 809-926-1818
Fax: 809-929-1182

Mr. Karamo Sanneh
Associate Professional Officer
Pan American Health Organization
Gravenstraat 60
Paramaribo, Suriname
Tel: 597 471 676
Fax: 597 471 568

Dr. Abdelmalik Hashim
Associate Professional Officer
Pan American Health Organization
P.O. Box 10969
Lot 8, Brickdam
Georgetown, Guyana
Tel: 01 592 2 53000
Fax: 01 592 2 66654

34

Mr. Henry Smith
EPI Officer
Caribbean Epidemiology Centre
P.O. Box 164, Port of Spain
Trinidad, W.I.
Tel: 809 622 3404
Fax: 809 622 7292

Dr. Stephen Blount
Director,
Caribbean Epidemiology Centre
P.O. Box 164
Port of Spain
Trinidad, W.I.
Tel: 809-622-
Fax: 809 622 2792

Dr. James Hospedales
Head, Epidemiology
Caribbean Epidemiology Centre
P.O. Box 164
Port of Spain
Trinidad, W.I.
Tel: 809-622-2152
Fax: 809 622 2792

Ms. Victoria Morris-Glasgow
Sr. Laboratory Technologist
Caribbean Epidemiology Centre
P.O. Box 164
Port of Spain
Trinidad, W.I.
Tel: 809 622 4261/2
Fax: 809 622 2792

Dr. Takaaki Ohyama
STC/EPI
Caribbean Epidemiology Centre
P.O. Box 164
Port of Spain
Trinidad
Tel: 809 622-3404
Fax: 809-622-2792

Ms. Holly Normoyle-Elke
Lab. Safety Officer
Caribbean Epidemiology Centre
P.O. Box 164
Port of Spain
Trinidad, W.I.
Tel: 809 622 4261/2
Fax: 809 622 2792

DONOR AGENCIES

UNICEF:

Ms. Elaine King
Assistant Project Officer
UNICEF
2nd Floor, Building # 2
Chelston Park, Culloden Road
St. Michael
Barbados
Tel: 809-436-2119
Fax: 809-436-2812

Mr. Derven Patrick
Project Officer
Primary Health Care Officer
UNICEF
60 Knutsford Boulevard
Kingston 10
Jamaica
Tel: 809-926-7584
Fax: 809-929-8084

Mr. Mohammed Hamid
Assistant Programme Officer (Health)
UNICEF
Brickdam
Georgetown
Tel: 592-2-73662
Fax: 592-2-65894

ROTARY:

Dr. Nesly Vastey
Chairman,
Programme Polio Plus Caraibes
Rotary International, Delmas, BP 13068
Avenue Nicolas # 103, Port-au-Prince
Haiti
Tel: 509-462-028
Fax: 509-223-350

CHRISTIAN CHILDREN'S FUND:

Mr. Francis Joseph
Director, Area Programme
Christian Children's Fund
22 Hilborough Street
P.O. Box 977
Roseau
Commonwealth of Dominica
Tel: 809 448 8817/809 448 7230
Fax: 809 449 8006

Dr. Jacqueline Carlson
Physician/Manager
Disease Control Service
Public Health Branch Ontario
Ministry of Health
8th Floor, 5700 Yonge Street
North York, Ontario
M2 M 4K5
Canada

SECRETARIAT

Ms. June Maynard
CAREC
Trinidad, W.I.
Tel: 809-622-3404
Fax 809-622-2792

-31-

Ms. Ruth Cominsty
San Juan Puerto Rico Convention Bureau
Puerto Rico

Blanquita Rivera
Department of State
San Juan
Puerto Rico

Pura I. Fuste
Department of Health Office of the Secretary of Health

Wilda Perez Sierra
Department of Health
Central Office of Aids & Sexual Disease