EPI Newsletter

Expanded Program on Immunization in the Americas

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Brazil accelerates control of rubella and prevention of congenital rubella syndrome

Background

Seroprevalence studies for rubella antibodies conducted in Brazil in the late 1980s and early 1990s laid the groundwork for the implementation of the country's rubella vaccination strategies. Serological testing in Fortaleza (Rey CL, *et al*.) in 1997 revealed that the most susceptible group among pregnant and post-partum women were those 15 to 19 years of age (39%).

The introduction of MMR (measles/mumps/rubella) vaccine or MR (measles/rubella) vaccine to the basic immunization schedule in Brazil's 27 States was initiated in 1992. Technical criteria considered for their introduction included: DPT and/or measles vaccination coverage, adequate surveillance of vaccine-preventable diseases, rubella and congenital rubella syndrome (CRS) surveillance, and improved prenatal monitoring of pregnant women exposed to rubella virus.

It was, however, with the implementation of the measles eradication initiative in Brazil that the magnitude of rubella as a public health problem became known. Between 1993 and 1996, nearly 50% of the cases in which measles was ruled out were subsequently diagnosed as rubella (with ≈75% of them laboratory-confirmed). In 1992 an incidence of 1.5 per 100,000 was reported; in 1997, this figure was 20.6 per 100,000, and in 1999/2000, 9.0 per 100,000.

Data from 1997 to 2000 showed a shift in the incidence of rubella by age group. In 1997/1998, with the exception of children under 1 year of age, the highest incidence rate occurred in the 1 to 9-year age group (15.0 per 100,000), followed by children aged 10 to 14. In 1999/2000, the incidence in the 15 to 29-year group rose from 7.0 to 13.0 per 100,000 higher than observed in the 5 to 9 and 10 to 14-year age groups. This shift in the transmission of the virus toward susceptible young adults is related to the gradual introduction of the triple viral vaccine, and the 95% vaccination coverage achieved in the 1 to 11-year age group in most Brazilian States between 1992 and 2000.

In this issue:

In the 1998/2000 rubella outbreaks reported in several States, São Paulo and Paraná notified most cases and the highest incidence in the 20 to 29-year age group (23 per 100,000 pop.); and Rio Grande do Norte the highest proportion of cases (61%) in adolescents and young adults. Two of the States in which these outbreaks occurred adopted the strategy for accelerated rubella control and CRS prevention as a control measure. In Paraná, a campaign was carried out in April 1998, targeting 1.7 million women between the ages of 15 and 39 years and reached a vaccination coverage of 86%. A campaign in Río Grande do Norte held in September 2000, with the goal of vaccinating over 750,000 women between the ages of 12 to 49 years reached coverage levels of 72%.

Prior to the introduction of the vaccine in Brazil, a study (Salerno *R, et al*.) had reported deafness attributable to CRS in 3% of children under 15 years of age. In another study (Herdy *GVH, et al.*) during autopsies on cadavers with acute myocarditis, 4% of the cases were attributed to CRS. In 1996, CRS was added to the list of notifiable diseases in Brazil. Following the rubella outbreaks of 1998-2000 that reported a high incidence among young adults, an increase in the incidence of CRS was observed. From 1997 to 2000, 876 suspected cases of CRS were reported, and 132 were confirmed during that same period. The number of CRS cases rose from 38 in 1999 to 78 in 2000. Still, given the underreporting of such cases, these numbers continue to represent only the tip of the iceberg in terms of the real incidence of the disease.

Based on epidemiological analyses of rubella and CRS, Brazil developed a two-phase vaccination plan using MR vaccine (Edmonston-Zagreb and AR 27/3 strains) to accelerate the prevention of CRS. The first phase was undertaken in 13 States during the month of November that targeted over 15 million women of childbearing age - São Paulo, Santo Espírito, Paraíba, Pernambuco, Sergipe, Rio de Janeiro, Minas Gerais, Goias, Amazonas, Halagaos, Marrano, Rondonia, and Acre. Each State determined the age group to vaccinate, utilizing the following variables: (a)Vaccination coverage and year of MMR or MR introduction; (b)Vaccination coverage achieved during measles *follow-up* vaccination campaigns (as part of the measles eradication initiative) that had utilized MMR or MR vaccine; (c) Analysis of rubella incidence by age group and among pregnant women between 1997 and 2000; and (d) Proportion of live births by age of the mother.

The decision of age groups to be targeted for vaccination included the participation of all immunization coordinators of each of the 13 States, as well as the participation of the National Technical Committee on Immunization. Overall, the age group targeted for vaccination was set between 12 and 39 years of age. However, some States have adjusted the target age group.

The campaign

- ***Planning:*** Estimates of the target population were developed by looking at institutions and places with large concentrations of people, such as universities, institutes, factories, stores, shopping centers, businesses, hotels, recreation and tourist centers, banks, State Secretariats, municipal Secretariats and public institutions. Another listing was devised in those areas where a program of community health agents (PACS) and a Family Health Program (PSF) are being implemented. Potential urban and rural target population groups were also identified. Based on the population of the municipal area of influence and transient population, every locality established its own timetable and vaccination tactic.
- ***Social mobilization:*** Considered a key component for the success of a vaccination campaign targeting adults, social mobilization and public awareness committees were set up in each State. These were comprised of the municipal and State Health Secretariats, the Secretariat of Education, the Federal Council of Medicine and its regional chapters, the Brazilian Society of Pediatrics, the Brazilian Society of Gynecology and Obstetrics, state chapters of the National Commission of Nurses, the Communication Advisory and the National Foundation of Health/FUNASA. Among their first tasks were those of raising awareness, ensuring that people understood the campaign's objectives, and rallying for political support with State and municipal governments.

  A technical arm of these committees included regional advisers on exanthematic diseases and technical staff from the areas of immunization, epidemiological surveillance, and women's health, the PACS/PSF, representatives of national reference laboratories, and the associations representing the physically disabled. Together with the municipal secretaries, this team closely monitored the campaign’s plan to ensure reaching a high vaccination coverage. Critical were also the campaign’s inter-sectorial activities. The following groups collaborated in this effort: the National Confederacy of Women, non-governmental organizations, social clubs such as the Lions and Rotary Clubs, the Federation of Industries, the State Chambers of Commerce, and unions, among others.
- ***Public awareness campaign***: A major challenge was the preparation of a public awareness campaign that would effectively persuade, inform and guide the adult population, which had little knowledge of CRS, its relation to rubella virus, the existing, high rubella infection rate and the severity of the disease. Another objective of the public awareness campaign was to convince women who had deferred pregnancy to get immunized, in order to protect the health of other women. In this regard, the mass media played an important role and their efforts throughout

the campaign have been monitored to determine the impact. Other media used to raise public awareness among the population included messages on paychecks, automatic teller machines (ATM), as well as messages on water, electricity, and phone bills.

Public awareness messages were developed to clearly point to the location and time of the campaign, and to inform the public to carry their vaccination cards during the month of the campaign's implementation, to avoid revaccination. Health professionals who are known and respected opinion leaders in the country were used for clarifications and in case of problems. With the collaboration of the communication's staff of FUNASA, a rapid response plan was also developed to address any crisis situation.

An information hotline was set up for the public: the most frequently asked questions included where to go for vaccination (36%), what to do if a pregnant woman was inadvertently vaccinated (14%); and about adverse events (10%). A national teleconference was also held at every stage of the initiative, to clarify the campaign's objectives, as well as technical and organizational aspects, issues related to vaccine safety, and queries of campaign staff and health professionals.

- ***Vaccination tactics:*** Outreach vaccination activities (mobile clinics and fixed posts) were carried out during the first two weeks and targeted the following population: public and private schools, government institutions, factories and businesses, as well as supermarkets, shopping centers, bus and train stations, ports and major highways. In the last two weeks of the campaign, house-to-house visits targeted women of childbearing age during hours when they were most likely to be home. At the same time, in areas where the PSF was operating, vaccination in rural areas was conducted by summoning people to a central point or door-to-door.
- ***Monitoring and evaluation:*** The campaign took into consideration the difficulties in identifying population groups in large urban centers that had not been vaccinated through house-to-house visits. In order to ensure vaccination coverage of over 95%, a rapid assessment guide was developed, to identify the main obstacles and population groups that had not been vaccinated. The findings of the assessment allowed for the re-definition of the campaign's strategies, placing greater emphasis on public awareness campaigns, participation of managers at the different levels, and rapid monitoring of coverage to guarantee homogeneity. Criteria used for monitoring vaccination coverage included: neighborhoods in large cities; major work centers, remote areas with poor access to vaccination services (indigenous areas, makeshift settlements), border areas, and small municipalities with persistent low coverage. Vaccination was done simultaneously with monitoring of coverage.

  Once the campaign was over, health authorities used the rapid assessment guides to determine population groups that had not been vaccinated, and to design effective means of reaching them. Emphasis was also placed on municipalities that had failed to obtain 95% vaccination coverage. This painstaking local effort during the final phase of the campaign boosted coverage by approximately 10%.
- ***Safety of the vaccine:*** A rapid response system was set up for the public for the notification of adverse events. Similarly, to reduce the risks to health workers and the community of blood borne infections due to accidental needle sticks, a disposal system was developed for the safe collection and final disposal of syringes and needles. A protocol was also implemented, to follow-up on women who were inadvertently vaccinated while they were pregnant. As of the first phase of the campaign, there were 6,634 pregnant women registered who had been vaccinated, of these 1,037 were susceptible during the time of vaccination, and 566 were pending laboratory results.

Initial campaign results

Preliminary reports indicate that Brazil's rubella vaccination campaign carried out in 13 States has reached a vaccination coverage of 93% of a target population of over 15 million women of childbearing age. Municipalities that failed to reach coverage over 95% have continued with mop-up vaccination among unvaccinated groups that were identified through rapid monitoring of coverage. Women who were pregnant (1,126,585) during the campaign will be vaccinated immediately after they give birth.

Next phase

During the second phase of the initiative, over 12 million women of childbearing age between the ages of 12 to 39 years will be vaccinated in 11 States - Rio Grande do Sul, Santa Catarina, Mato Grosso, Mato Grosso do Sul, Para, Roraima, Amapá, Tocantins, Bahia, Ceará, Piauí. The campaign is scheduled between 15 June and 5 July 2002, and will include the vaccination of more than 370,000 susceptible indigenous population.

Source: Maria de Lourdes Maia, National Immunization Program/ National Health Foundation; Jarbas Barbosa da Silva, National Health Foundation; Rosa Castalia Soares, National Immunization Program/ National Health Foundation; Teresa Cristina Segatto, National Health Foundation; Maria Salet Parise, National Health Foundation; Tatiana M. Lanzieri, National Health Foundation; Marilia Ferraro Rocha, National Immunization Program/National Health Foundation; Maria Salet Parise, National Health Foundation; Cristiana Toscano, PAHO/ Brazil; Carlos Castillo-Solorzano, PAHO/Washington, USA.

Regional Measles Database: How "clean and complete" are the data?

As discussed in previous *EPI Newsletter* articles, "cleaning" of data after entry into any database is crucial. Country managers are encouraged to review the quality of the data entered before sending the weekly data files to PAHO/Washington. In addition, no data fields should be left blank. To estimate both the quantity of potential data entry errors and the completeness of the data in the regional database, an evaluation was conducted of the Measles Erradication Surveillance System database (MESS) in Washington, D.C. for years 2000 and 2001 (as of March 29). The data for both years was extracted into EPI INFO and simple frequencies were tabulated on selected key variables. For each variable, the following was determined: (1) the number of variables that lacked information, (2) the consistency in the use of a "ZZ" when information was not available (as is recommended) versus simply leaving the field blank, and (3) if there were obvious data entry errors, e.g., entering an impossible data such as 1888 or entering an "F" when only "A, B, or C" are options. No attempt was made to verify the accuracy of the data entered.

Table 1. Missing information and data entry errors by variables in MESS, the Americas, 2000-2001

	Year 2000 (n=24,552 records) Number			Year 2001 (n=16,675 records) Number		
Variable	**Blank**	**"ZZ"**	**Error**	**Blank**	**"ZZ"**	**Error**
Date reported	46	0	0	0	0	0
Date onset rash	0	0	0	0	0	0
Site type	596	555	1	305	57	3
Type of rash	2027	394	0	825	211	6
Date investigated	2183	89	107	1283	426	2
Source	617	77	1	0	75	0
Case classification	0	0	0	0	0	0
Classification code	67	0	0	582	0	0
Gender	71	40	2	24	14	6
Age	103	237	2	34	49	9
Number doses (Measles)*	359	6079	9	334	2517	0
Date of last measles dose**	1798	6440	10	1056	3652	10
Fever	1631	79	2	603	33	0
Date onset fever	199	0	0	131	0	1
Trip	2341	1658	6	840	778	0
Conjunctivitis	1925	544	0	745	213	0
Coryza	1917	544	0	724	190	0
Cough	1860	388	1	708	134	0
Contact	2259	1893	0	939	960	0
Date of confirmation	297	0	4	3	0	0
Lymphatics	2017	890	0	819	260	0
Hospitalization	1894	247	0	0	56	0
Death	1967	261	1	777	57	0
Initial diagnosis	394	0	0	391	0	0
Final diagnosis	0	5949	0	0	3998	0
No. rubella doses*	1964	4740	0	732	2341	0
Date last rubella doses**	433	4599	0	1075	1488	0
Arthralgias	3406	4751	0	1480	1679	0
Pregnancy status***	309	577	0	132	40	0
Weeks pregnant****	13	16	0	8	13	0
TOTAL	**32,693**	**41,047**	**146**	**14,550**	**19,241**	**37**

* Among persons at least 1 year of age
** Among persons at least 1 year of age & with at least 1 dose of vaccine
*** Among women 15 years of age or more
**** Among pregnant women 15 years of age or more

Thirty variables were evaluated for 24,552 records in 2000 (657,175 possible responses) and for 16,675 records in 2001 (440,077 possible responses) for a total of 1,101,252 possible responses. As seen in Table 1, during both years, only 0.017% of possible responses had obvious errors (0.02% in 2000 and 0.008% in year 2001). During year 2000, most errors dealt with dates that were entered incorrectly. Of the total 146 data entry errors detected in year 2000, 107 (73%) were associated with the Date of Investigation. For example, according to data in MESS, many cases with onset in 2000 were investigated at the turn of the century (i.e., 1900). Of the 37 obvious data entry errors in year 2001, 10 were associated with the date of the last dose of measles vaccine.

However, for both years, numerous fields lacked information. For year 2000, 11.2% of all responses had missing information, i.e., 5% were left blank and 6.2% had a "ZZ" for unknown. During year 2001, 7.7% of fields had missing information, i.e., 3.3% were left blank and 4.4% had a "ZZ".

The amount of missing information varied greatly by variable and by year. In general, year 2001 had less missing information per variable. Some variables such as Date Reported, Onset Date of Rash and Case Classification had no missing information in year 2001.

In 2000, among the 21,273 persons at least one year of age, 6,438 (30%) had no information on measles vaccination status. Among persons who had at least one dose of measles vaccine, 52% had no date of vaccination. In year 2001, the comparable percentages were 21% and 47%, respectively. In year 2000, of 6,483 persons vaccinated against rubella, 78% had no date of vaccination. In year 2001, 62% of the 4,435 persons vaccinated against rubella had no information on the date of vaccination.

In 2000, 831 women 15 years of age or more were confirmed to have rubella. Of these, 43 had information stating

they were pregnant. However, pregnancy status was missing for 282 (34%). Of the 43 pregnant women with rubella, 7 (16%) had no information entered into MESS on the number of weeks that they were pregnant and 27 (63%) had information stating that they were 1-20 weeks pregnant. During year 2001, 244 women 15 years of age or more were confirmed to have rubella; 14 were pregnant and 18 (7%) had no information on their pregnancy status. Of the 14 pregnant women with rubella, 1 had no information on the number of weeks that she was pregnant and 11 (79%) had information stating they were 1-20 weeks pregnant.

Editorial Note: National managers should ensure the quality of the data entered into the national MESS databases. This evaluation (which did not address the actual accuracy of the data entered) suggests that there are few obvious data entry errors, and that errors have decreased in the year 2001, when compared to year 2000. However, many variables in many records still lack information. As recommended for MESS, fields lacking information can be left blank at the onset of the investigation. However, upon completing the investigation, variables with missing information should have a "ZZ" entered implying it is truly "missing information" as opposed to not having been collected at the onset of the investigation, i.e., when the field is left blank. While every attempt should be made to obtain all data, some information is more crucial than other, e.g., vaccination history and dates of vaccination. Likewise, information on the pregnancy status of women with rubella must be collected. All infants born to women with rubella during pregnancy must be closely following and evaluated.

Outbreak of Jungle Yellow Fever in Minas Gerais, Brazil

Background

Jungle yellow fever in Brazil has been occurring in cyclical variations over the past 50 years, with outbreaks every 5 to 7 years, approximately. In 1995, an intensification of viral circulation began in Brazil's neighboring countries with which Brazil shares its ecosystems, particularly Peru and Bolivia. In 1998, an outbreak occurred on the Island of Marajó, in Brazilian State of Pará, with transmission persisting until 1999. In the same year, viral circulation spread to Tocantins, and later towards the southern and eastern parts of the country. In the beginning of 2000, an outbreak occurred in which the main area of transmission was the Chapada dos Veadeiros National Park in the State of Goias, striking tourists from a number of cities in Brazil. Although the vast majority of cases occurred in the state of Goias, transmission was also observed in other parts of the country, spreading beyond the areas traditionally considered to be at risk. Indigenous cases appeared in areas where the presence of the virus had not been recorded for nearly 50 years.

The Outbreak

In the period of January to March 2001, an outbreak of jungle yellow fever occurred in 11 cities in the Center-West region of Minas Gerais, approximately 150 km from the capital, Belo Horizonte. Transmission occurred predominantly in the municipalities of Divinópolis Health Region, where 32 cases and 16 deaths were confirmed (Table 1), and persisted for approximately two months. Onset of symptoms in case-patients occurred from January 14th to March 18th, 2001. The heterogeneous vaccination coverage in these regions obtained in the previous year's vaccination campaign[1], together with the delayed detection of the outbreak (identified after eight deaths had already occurred) contributed to its occurrence and severity.

Among the 32 confirmed cases, 74% resided in urban areas, including the metropolitan area of Belo Horizonte. However, all of them had been exposed to the jungle or sylvatic cycle of yellow fever through occupational exposure, tourism, or residence in the vicinity of jungle vegetation. It should be emphasized that many cities in the area where transmission occurred have urban areas closely located to swampy areas with tropical vegetation and a large monkey population.

Case-patients were predominantly adult men (84%), and their median age was 40 years (range: 16-68 years). The case-fatality rate was 50%, consistent with rates reported in previous outbreaks. None of the confirmed cases had received yellow fever vaccine on time in order to obtain protection. Twenty-eight cases (88%) were confirmed by laboratory and 4 (14%) by clinical-epidemiological criteria. Laboratory-confirmed cases had positive serum IgM antibodies and/or detection of viral antigens. Laboratory exams were performed at the national public reference laboratories.

Entomological surveillance was conducted by four surveillance teams from the State of Minas Gerais (National Health Foundation, Health State Services), and reported that yellow fever vectors were captured at the probable infection sites and in the surroundings of areas were the case-patients resided. *Haemagogus* and *Sabethes* genus were identified in jungle areas and *Aedes* was identified in urban areas. Attempts to isolate viruses from these samples resulted negative. In some cities where epizootic cases occurred, sam-

1 For example, although the average vaccination coverage in Divinópolis Health Region was 75%, in the municipality of Leandro Ferreira, the area most affected by the outbreak, vaccination coverage was as low as 6%.

ples had been collected from a recently dead monkey of the species *Callitrix penicillata*, but the testing for viral antigens resulted negative.

Control Measures

Initially, the area at-risk for transmission was defined and included 54 municipalities from Divinópolis Health Region, 37 from Metropolitan Belo Horizonte Health Region, and 9 from Sete Lagoas Health Region. In response to the epidemic, an intensified vaccination campaign was put in place on March 9th, 2001 and included house-to-house vaccination, and fixed post vaccination in bus stations, and at posts set up along the main highways. In the Divinópolis Health Region, 509,551 people were vaccinated, achieving a 100% coverage in 48 municipalities, 80%-99% in 3, and < 80% in 3. In the Metropolitan Belo Horizonte Health Region, 3,930,011 people were vaccinated, achieving 91% coverage in the region. Strategies to vaccinate travelers bound for the region were put in place, including campaigns to heighten public awareness in the areas of origin, particularly the Metropolitan Region.

Table 1. Number of cases, deaths, and case-fatality rate for Jungle Yellow Fever by probable transmission site. State of Minas Gerais, Brazil. January to March 2001.

Municipalities	Cases	Deaths	Case-fatality
Leandro Ferreira	7	5	71%
Santo Antonio do Monte	4	3	75%
Nova Serrana	4	0	0%
Bom Despacho	4	3	75%
Estrela do Indaiá	4	2	50%
Conceição do Pará	2	1	50%
Martinho Campos	2	1	50%
São Gotardo	2	0	0%
Pará de Minas	1	0	0%
Moema	1	1	100%
Luz	1	0	0%
Total	**32**	**16**	**50%**

All suspected cases were investigated, with active search of any suspected case of fever and jaundice or hemorrhage. In order to improve the sensitivity of surveillance during the course of the investigation, active search for a cute cases of fever without a vaccination history was initiated. Blood samples were taken from all suspected cases and sent for serological testing. Suspicious deaths were investigated, and when it could be done on a timely basis, viscera samples were collected for immunohistochemistry and viral isolation studies. Provision of clinical care by healthcare facilities in the region was strengthened, to ensure adequate medical care for patients, who were referred to hospitals for treatment.

In addition to the entomological surveillance in areas with transmission and urban sections of the municipalities, vector control measures in the main town of the municipalities were intensified to prevent transmission by *Aedes aegypti* in the region.

Surveillance of adverse events associated with the yellow fever vaccine was established, resulting in the identification of one death temporally associated with the vaccine. Subsequent laboratory testing at the Oswaldo Cruz Foundation in Rio de Janeiro identified the vaccine as the cause of death. An association with the patient's idiosyncratic factors has yet to be identified.

The adoption of control measures in the municipalities of the region led to the interruption of transmission; no additional cases were detected after March 18, 2001. Active case search of susceptible population who are due to received yellow fever vaccine continues in the region, as well as heightened epidemiological surveillance activities.

Given the intensified transmission of jungle yellow fever in Brazil, with the expansion of the area with viral circulation, as well as the risk of urban transmission in the Americas, the Brazilian National Foundation of Health is implementing a plan to intensify its control. Collaboration with PAHO and participation of the State and municipal health Secretariats on this effort is ongoing. The control measures include:

1. Expansion of vaccination efforts to all the regions deemed at risk for the transmission of jungle yellow fever in the country, which includes 18 States and the Federal District of Brasilia;
2. Vaccination of travelers bound for areas at risk;
3. Implementation of febrile icteric and icterohemorrhagic syndromic surveillance, including training for health professionals and establishment of these procedures as a routine within the health care system and the public health laboratory network;
4. Implementation of entomological and epizootic surveillance to identify areas with viral circulation;
5. Intensification of *Aedes aegypti* control measures, with selection of priority areas for intervention.

To heighten the effectiveness of these actions, communication and health education activities have been launched, targeting health professionals and the general population, specially groups with the risk of greatest exposure to yellow fever.

Source: Eduardo Hage Carmo – FUNASA; Emanuel Martins - FUNASA; Heloisa Pelucci – SES-MG; Maria de Lourdes Maia - FUNASA; Roberto Duzzi - FUNASA; Sueli Tuboi - FUNASA; Zouraide Guerra - FUNASA, Brazil.

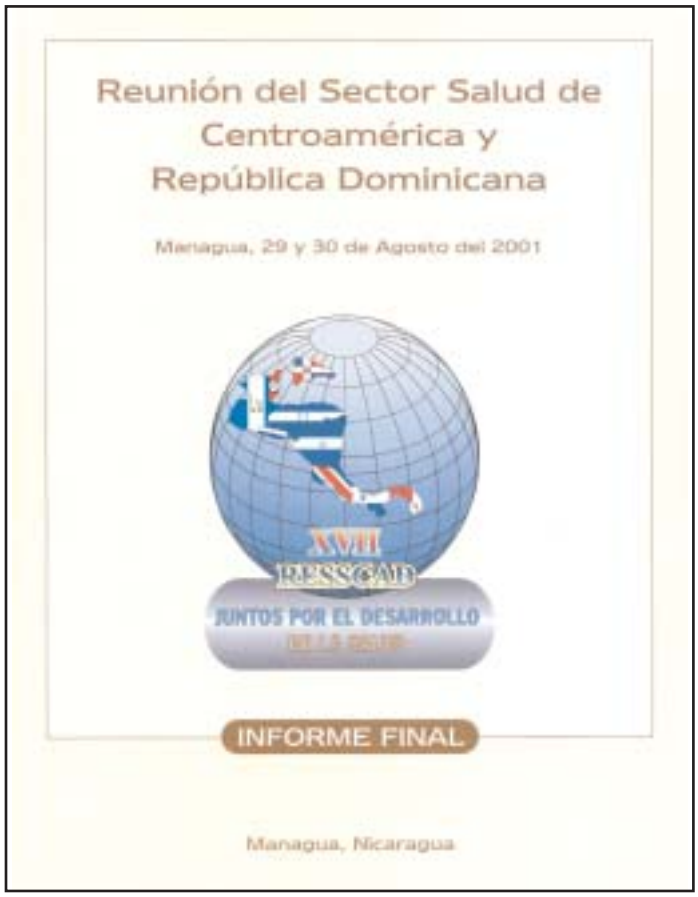
Coverage Rates: DPT-3, OPV-3, Measles, BCG
Region of the Americas, 2000 and 2001**

	DPT		OPV		Measles		BCG	
Country	**2000**	**2001**	**2000**	**2001**	**2000**	**2001**	**2000**	**2001**
Anguilla	92	99	94	99	99	92	99	99
Antigua & Barbuda	95	97	96	99	90	96	n/a	n/a
Argentina	80	...	85	...	91	...	99	...
Bahamas	99	98	91	98	93	92	n/a	n/a
Barbados	94	...	86	...	94	...	n/a	n/a
Belize	89	...	89	...	96	...	95	...
Bermuda*	30	64	30	34	...	...	...	64
Bolivia	89	90	89	90	99	99	95	95
Brazil	98	95	99	99	99	99	99	99
British Virgin Islands	99	99	99	99	99	99	99	99
Canada	...	...	...	...	...	...	n/a	n/a
Cayman Islands	93	92	92	92	89	87	90	93
Chile	97	99	89	99	97	98	99	93
Colombia	74	80	78	83	75	90	86	87
Costa Rica	88	91	79	92	84	85	92	87
Cuba	99	99	99	99	96	99	99	96
Dominica	99	99	99	99	99	99	99	99
Dominican Republic	78	72	67	87	88	98	90	96
Ecuador	89	90	83	92	89	99	99	99
El Salvador	99	92	98	94	97	82	99	92
Grenada	97	96	97	96	92	99	n/a	n/a
Guatemala	95	86	94	86	98	82	97	87
Guyana	88	85	78	90	86	93	93	95
Haiti	59	49	58	53	80	53	57	49
Honduras	96	95	87	99	99	98	99	93
Jamaica	86	89	86	91	88	85	94	96
Mexico	89	99	89	99	96	...	99	99
Montserrat	85	98	85	98	99	89	99	90
Nicaragua	89	92	94	92	99	99	99	98
Panama	98	92	99	96	97	87	99	99
Paraguay	80	89	73	90	92	90	79	86
Peru	98	90	93	90	97	99	93	87
St. Kitts & Nevis	99	99	99	99	99	94	99	95
St. Lucia	70	...	70	...	89	...	91	...
St. Vincent & Grenadines	99	99	99	99	96	98	99	99
Suriname	78	68	78	65	81	82	n/a	n/a
Trinidad & Tobago	90	91	90	91	90	91	n/a	n/a
Turks & Caicos	99	...	99	...	99	...	99	...
Uruguay	88	...	88	...	90	...	99	...
Venezuela	77	63	86	79	84	44	99	85

* data incomplete
** 2001 Provisional data
n/a - Data not applicable
... Data not available
Date updated: 18 April 2002

Central America reaffirms commitment to immunization goals

During the last meeting of the health sector of Central America and the Dominican Republic (RESSCAD) held August of 2001, in Nicaragua, health ministers unanimously endorsed an agreement that keeps national immunization programs in the sub-region as a high priority within the countries' national health agenda (Agreement XVII RESSCAD-NIC-1).



The Agreement states that the measles situation and that of poliomyelitis due to a vaccine-derived poliovirus type 1 outbreak in the Dominican Republic and Haiti between 2000-2001, underline the risk of polio and measles virus introduction in the sub-region. Furthermore, analyses of vaccination coverage data and of epidemiological surveillance indicators underscore the need to review and strengthen the activities of the sub-region's immunization programs. Health ministers agreed to work with the Pan American Health Organization in the development of a sub-regional Plan of Action that would include enhanced monitoring of vaccination coverage at the municipal level, the evaluation of national epidemiological surveillance systems of vaccine preventable diseases, and the active search of cases. It was also agreed that the topic of immunization be part of the RESSCAD agenda on a permanent basis.

The circulation of measles virus has almost been eliminated in Central America in the past five years, with the exception of a small outbreak in Costa Rica in 1999, and the importation of two measles cases in young adults in El Salvador in 2001. The majority of countries in the sub-region are carrying out *follow-up* measles vaccination campaigns every four years, or earlier based on vaccination coverage obtained among infants during routine services since the last campaign. Guatemala, for example, has moved up its *follow-up* measles vaccination campaign from 2003 to early 2002, as a result of an analysis of recent vaccination coverage levels for children under 1 year of age, which identified the border areas with Mexico at high-risk for a measles outbreak.

Current efforts of immunization programs in Central America are focused on closer monitoring and follow-up of vaccination coverage reached at the municipal level, as well as on enforcing compliance with key epidemiological surveillance indicators, particularly those monitoring case detection and thorough investigation.

The *EPI Newsletter* is published every two months, in Spanish and English by the Division of Vaccines and Immunization (HVP) of the Pan American Health Organization (PAHO), Regional Office for the Americas of the World Health Organization (WHO). Its purpose is to facilitate the exchange of ideas and information concerning immunization programs in the Region, in order to promote greater knowledge of the problems faced and their possible solutions.

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