

EPI Newsletter

Expanded Program on Immunization in the Americas

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IMMUNIZE AND PROTECT YOUR CHILDREN

June 2001

Measles importations in El Salvador

Outbreak description

The following is a preliminary report on the investigations surrounding the importation of two measles cases in El Salvador.

On May 9, 2001, five years after having reported the last indigenous measles case (1996), a private physician notified the Ministry of Health of the presence of two suspected measles cases, two brothers 23 and 22 years old, with disease onset on April 30, 2001, eight days after returning to El Salvador from a trip through Europe.

They had left El Salvador by plane with their parents and an 8-year old brother on April 8 via Houston-Paris (transit) and reached Switzerland where they stayed from 9-14 April. On April 14, they traveled by train to Madrid, Spain, traveling through France, which took them 24 hours. They stayed in Madrid from April 15-21 (7 days), returning by plane to El Salvador via Paris, with a 24-hour layover in Houston. They arrived in El Salvador on April 22.

While in Switzerland, they stayed with family members who confirmed by phone that they did not have or knew of any other similar case. In other countries, they stayed in hotels and did a lot of sight-seeing, yet they stated that they had not been in contact with any other individual presenting rash and fever.

However, during the train ride from Switzerland to Madrid, they remembered a passenger in the sleeping compartment next to them, who was traveling the same itinerary. This passenger seemed to be extremely sick, coughing constantly while in the hallway. However they were not sure whether that person had any sort of rash.

Case notification was made to the El Salvador's National Biological Center on May 9, date when the investigation was initiated. The first case, age 23, had onset of fever on 30 April (8 days after returning from Europe); two days later he presented with a macupapular rash on the face which later extended to the rest of his body, accompanied by cough, conjunctivitis and coryza. He felt general malaise and required hospitalization. At the time of the investigation, the patient had clinically recuperated, presenting with a light desquamation on his face and neck. The second case, age 22, had onset of fever on May 2 (three days after his brother) and four days later presented with a macupapular rash - a similar clinical evolution as his brother. Both cases were admitted to a private hospital from May 7-14.

They denied having any close contact with individuals with similar symptoms, such as family members, neighbors, close friends, and study or work colleagues. Both cases were immunized by their private pediatrician with a single dose of measles vaccine on August 1, 1980. The 8-year old brother was immunized and did not develop any symptoms. The mother and father mentioned they had measles.

Serum samples for IgM determination for measles and urine samples for viral culture were taken on May 9, 2001 in both cases. Both samples tested positive for IgM antibodies to measles by the Behring kit.

During their incubation period, both individuals attended their university (same for both), one of them also works there. The girlfriend of one of the cases was immunized and studies at a different university. The family, as well as both cases went to their places of employment and study, among others. Of these, 20 were singled out because they are well-

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attended (restaurants, movie theaters, banks, grocery stores, among others). In addition, they were guests at a collective baptism, where 43 children were baptized.

Initial outbreak response

The first control measure of the outbreak was to isolate both cases within the hospital. Hospitalization lasted for 5 days following rash onset, after which time it was considered that the cases were no longer contagious. On the night of May 9, prior to receiving news of laboratory confirmation, the decision was made to vaccinate all health personnel at the hospital where the cases were being treated. On May 10, immediately after the cases were officially confirmed by laboratory, the Ministry of Public Health and Social Assistance (MSPAS) held a press conference announcing the presence of these two measles importations and outlining the control measures that were going to be implemented.

The Ministry of Health carried out the following surveillance and control measures:

- Inter-sectorial coordination between the Institute of Social Security and the private sector
- Diagnostic confirmation and case management
- Information campaign through the mass media
- Training sessions at the operational levels
- Social participation and mobilization
- Coordination with the Centers for Disease Control and Prevention (CDC) for determination of the viral genome
- Daily follow-up of the outbreak situation with the National Technical Committee
- Regular analysis of the outbreak situation with the Committee for Immunization Practices.

Activities carried out consisted of home visits, telephone contacts every 24 hours and investigation of all suspected cases. As a result of the mop-up immunization carried out at the places visited by both cases (universities, schools, businesses, banks, malls, churches, and place of residence of the cases), 18,618 individuals were vaccinated. The active search for suspected cases carried out by the outbreak control group included the investigation and daily follow-up of direct contacts. The search was extended at the national level and did not find any secondary cases. The maximum incubation period for the contacts during the hospital stay of the cases (7-14 May) terminated on 3 June.

A total of 91 patients were listed thanks to the collaboration of the private hospital and the hospital's physicians. The latter were included in the surveillance activities in an effort to report any suspected measles case. These patients were initially visited and informed about the situation. A daily follow-up by phone of patients was strictly enforced from the date of the first visit until June 3. The search included family members, employees and friends having had contact with them. None of these contacts (patients hospitalized

during the same time, attending physicians, and hospital personnel) presented with a suspected case of measles, neither did their families, or colleagues.

A study of 83 suspected measles cases reported before the diagnosis of the cases showed that 100% of the samples were IgM negative for measles, 7% (6) were IgM positive for rubella, and 4% (3) were positive for dengue.

Measles situation in the European countries visited

In January 2001, a confirmed case was reported in Barcelona and its source of infection traced back to Bali. Another case was reported in Madrid in April from an individual coming back from Equatorial Guinea. The D7 genotype is not circulating in this country. In Switzerland in 1999 and 2000, 35 and 24 measles cases respectively have been clinically confirmed. It is not known which genotype is circulating in Switzerland.

Analysis of results

- The absence of secondary cases to the imported ones is due in part to the immunity generated by previous outbreaks (last outbreak occurred in 1989), but above all it is the product of the major efforts undertaken by El Salvador to reach coverage rates above 95%
- The successful measles *follow-up* campaign carried out during the first quarter of the year, and which achieved a 98% coverage rate was critical in reducing the number of susceptible children
- The support from health authorities and the work accomplished by the technical teams at the different levels was a determining factor for the management and control of the disease
- The active participation of the Department of Virology of the Max Bloch Central Laboratory was fundamental for the effective management of the outbreak;
- The information provided by both cases and their family, as well as their active participation allowed for the implementation of targeted and timely measures
- The active participation from the community was also key in the achievement of proposed actions.

Conclusions

Based on the epidemiological investigation and the result of the viral genome (D7) study, it can be concluded that the measles outbreak consisted of two imported measles cases which were controlled without any single secondary case.

Recommendations

- Reach, maintain, and guarantee vaccination coverage above 95% in the 262 municipalities of the country
- Conduct *follow-up* measles campaigns using the door-to-door immunization strategy and obtain coverage above 95% in each municipality

- Intensify epidemiological surveillance of measles at the municipal level in San Salvador over the next twelve epidemiological weeks
- Maintain surveillance for suspected measles cases at the national level
- Vaccinate risk groups (school teachers and university

professors, employees of major manufacturing companies, university students, tourism sector, health personnel, customs officers and airport workers) with measles-rubella vaccine

- Mobilize the community to participate in immunization activities and active search of new cases.

Update: Vaccine derived polio outbreak in Hispaniola

Background

Since July 18, 2000, a total of 20 laboratory confirmed cases of OPV1-derived poliomyelitis have been reported in the island of Hispaniola, which comprises the countries of the Dominican Republic and Haiti. Of them, 14 cases were reported from the Dominican Republic and 6 from Haiti. None of the cases had a complete series of OPV vaccination. All cases were either not adequately vaccinated (15), or with unknown vaccination status (5). Their ages range between 9 months and 14 years. The median age is 3 years. Vaccination coverage against polio in areas where the cases occurred have fluctuated between 20 and 30%

Update

Dominican Republic: Since the first case became known, a total of 95 acute flaccid paralysis cases have been identified through increased surveillance and an intensive nationwide case search. Of them, 94 (99%) had stool samples taken. Fourteen of these cases have been confirmed as OPV1-derived poliomyelitis. The age group most affected was that between 1-4 years of age. In 2000, the rate of acute flaccid paralysis was 2.2 per 100,000 under 15 years of age; in 2001 the projected AFP rate is 2.8.

Since December 2000, a total of three national vaccination campaigns have been implemented: In December 2000, February and May, 2001. During each of these three rounds, over 1.1 million children aged 0-4 years were vaccinated, and a coverage over 95% was achieved on each round. The last confirmed case in the Dominican Republic, from Santo Domingo, had paralysis onset on January 25, 2001. Despite improved reporting and nationwide case finding, no additional cases have been detected.

Haiti: Since the beginning of the outbreak, surveillance was intensified and case finding has been implemented in all Departments of the country. A total of 29 cases of AFP have been identified, of which six have been confirmed, 17 have been discarded, 4 remain under investigation and 2 had no viable specimen and were therefore classified as polio-compatible. The first confirmed case, in a 2-year-old unvac-

inated child from Anse à l'Ombre, in the North-Western Department, had onset in August 30, 2000. All other cases had onset in 2001. The last case, an unvaccinated 2 year-old child from Delmas, in the metropolitan area of Port au Prince, had onset paralysis on April 26, 2001. Unlike what has been seen in the Dominican Republic, where most confirmed cases were linked epidemiologically and geographically in clearly defined outbreaks, none of the confirmed cases in Haiti have epidemiological or geographical links to each other, and they are also distant in regard to time of onset of paralysis. This, together with results of molecular analysis that show a greater genetical diversity in the viruses from Haiti, indicates a more widespread circulation of the OPV1-derived virus in Haiti.

Due to the severity of the situation and considering the logistical difficulties to be faced in Haiti, the Minister of Health decided to launch, May 20, 2001, an aggressive control strategy that includes two rounds of a "rolling" nationwide house-to-house OPV vaccination for all children ages 0 to 9 years, each preceded by a nationwide school vaccination campaign for children ages up to 9 years. This intervention was implemented with technical and financial support from PAHO, UNICEF, the World Bank, the Canadian Government and USAID, as well as the collaboration of the Ministry of Education and professional associations. The first phase of round one, a nationwide school vaccination for children up to 9 years of age during May 21-June 1, 2001, has already been finalized. It is being followed by a nationwide "rolling" house-to-house campaign which started in the three Northern Departments and the Metropolitan Area of Port au Prince (June 4-15), and which will continue in the two Departments of the Center and the remaining areas of the Western Department (June 18-29), to finalize in the South (July 2-13). Although data from 33% of the schools are not yet available, and most Departments have not yet started their campaign, preliminary results show that 898,704 (101%) of 889,197 school children and 557,070 (42%) of 1,372,569 non-school children have already been vaccinated during this first round.

Editorial note: No evidence for circulation of OPV-derived virus has been found in areas with high OPV coverage. However, there is evidence of the circulation of OPV-derived polioviruses in areas with very low coverage: (1) a type-2 OPV-derived virus circulated in Egypt for an estimated 10 years (1983–1993), and was associated with >30 reported cases; and (2) poliovirus type-1 derived from the vaccine that circulated in China during 1991-1993. Circulation of a vaccine-derived poliovirus stopped rapidly when OPV coverage increased.

With no additional confirmed cases reported since January, 2001 and a high vaccination coverage in the three rounds of the polio campaigns, the experience in the Dominican Republic is, once again, showing that the key factor in controlling circulating OPV-derived viruses is achieving and maintaining high OPV vaccination coverage. Should high coverage also be achieved in all municipalities during the

current two rounds of vaccination in Haiti, the circulation of OPV-derived viruses may soon be interrupted in the Hispaniola.

Since 1991, no cases of polio attributed to wild poliovirus have been detected in the Western Hemisphere. The current outbreak underscores the need for polio-free areas to maintain high coverage with polio vaccine until global polio eradication has been achieved. OPV is safe and effective and recommended for the eradication of polio. All countries should maintain high quality AFP and poliovirus surveillance and accelerate current activities to complete the global eradication of wild polioviruses. Health-care providers should consider polio in a differential diagnosis for AFP cases, especially those with a history of recent travel to the Dominican Republic and Haiti. These possible cases should be investigated properly, and include the collection of stool samples. Furthermore, any suspected case should be reported immediately to the country, state and local health departments.

Progress and lessons learned from Costa Rica's rubella campaign

As a result of the epidemiological surveillance analysis of rubella and congenital rubella syndrome (CRS) in Costa Rica, and to prevent the risk of having a population of young adults susceptible to rubella, the Ministry of Health, in close coordination with the Social Security System of Costa Rica (CCSS), implemented a National Immunization Day against rubella and measles, targeting men and women between the ages of 15-39 years, regardless of their immunization status (*EPI Newsletter*, February 2001).

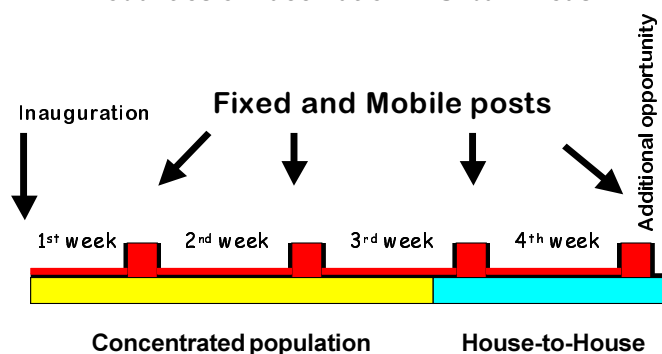
The magnitude of the target group to be vaccinated, 42% (1,606,329) of the country's total population, and its heterogeneous character (the inclusion of men and women, teenagers and young adults ages ranging from 15-39 years), put to the test the country's health services network. This initiative, however, provided the opportunity to gain useful experiences from the implementation of rubella vaccination strategies.

Dynamics of the National Immunization Days

A National Plan of Action and national guidelines were used as the basis to elaborate local and regional plans of actions. These included activities related to the campaign's preparation, training, supervision, monitoring and evaluation. Through these, the health areas and establishments identified the target population during the campaigns, calculated with the population registered in that specific area of influence, plus the population only residing in the area for work or study purposes. Furthermore, for vaccination

coverage estimates, the population was determined by canton or municipality based on data from the country's 2000 census.

Figure 1
Modalities of Vaccination in Urban Areas



Based on the target population, established programing criteria and each particular situation, plans specified the vaccination modalities (Figure 1), along with the financial and human resource needs, as well as the location and number of vaccination teams and vaccination posts (fixed and mobile). In general, the vaccination team consisted of a minimum of three individuals: a vaccinator, a recorder and a supervisor per every 10 vaccinators or vaccination posts. The number of teams was increased for health posts expected to show a greater demand.

The definition of vaccination strategies was based on the particular situation of the target population, access to existing services, availability of resources, and previous experience with similar activities. Notwithstanding, the campaign was also developed in a way that it would provide the population with different opportunities and times for vaccination.

- During the first two weeks, vaccination was carried out among the population clustered in working and studying centers
- In rural areas with disperse population, vaccination began in hard-to-reach areas followed by vaccination in urban areas. Several tactics were used to ensure reaching disperse population groups, such as mobile posts, a call to gather at strategic locations, the use of brigades, house-to-house vaccination, and flexible hours, as well as in some areas initiation of vaccination activities prior to the established period of the campaign.
- During the whole month, including weekends, vaccination was carried out at identified fixed and mobile posts. For the distribution and location of vaccination posts, special attention was given to the most densely populated areas, means of transportation, urban outskirts, irregular human settlements, as well as known gathering points, such as supermarkets, shopping malls, churches, transportation terminals, agricultural fairs and education centers.
- A third step consisted in a door-to-door vaccination using drawings or maps to guarantee vaccination of the entire population in the area, and to identify pockets of non-vaccinated groups. Given that the target population consisted of teenagers and young adults, this activity was preferably carried out after 4:00 p.m. In some areas, mop-up activities were also implemented
- During the last weekend, an additional opportunity for vaccination was given by making available a greater number of posts. This was complemented with a social mobilization campaign.



Social mobilization was a determining factor for the success the campaign, both in terms of the activities of social participation and those of mass communication. The overall slogan: “*Your health is in your hands...The vaccine against rubella makes the difference*”, was complemented with a specific slogan aimed at adolescents: “*Decide your future today...The vaccine against rubella makes the difference.*” Similarly, the widespread dissemination of the location and schedule of operations of vaccination posts, visits to the localities and institutions were also a positive factor.

The inter-sectorial action and the creation of alliances were essential elements of this joint effort. They included the participation of health institutions and that of other sectors, such as government and non-government, the private sector, community organizations, professional associations, as well as international technical and financial cooperation agencies. The strategy used allowed for the mobilization of resources from various types and sources, as well as the articulation of all initiatives towards a common objective. Activities were carried out both, at the national, regional and local levels.

The availability of timely and quality information of the target groups allowed for the quick implementation of corrective measures, to ensure the achievement of goals. Special formats were used for the campaign, both for the daily registration as for the consolidation of doses applied. Furthermore,

a software was designed for the consolidation of regional and national data. Information was obtained by age group, sex, canton, and health establishment. The local and regional teams obtained weekly information on the campaign results, for analysis of progress being made and decision-making purposes. The data were validated by rapid monitoring of vaccination coverage and presented graphically.

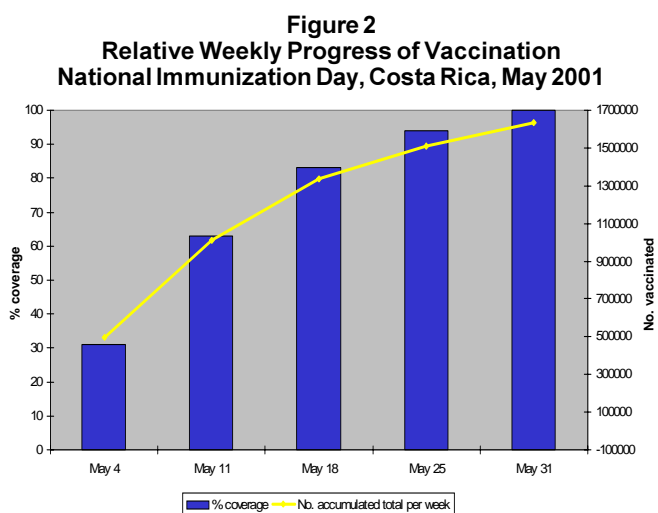
Another critical aspect of the campaign was the supervision at the various levels. The figures of “godfathers or godmothers” was created to facilitate both communication and coordination among teams, as well as for advisory services of the planning and evaluation aspects.

Results

The campaign was officially initiated May 2, although some health areas were allowed to begin a week earlier because of difficulties of access or for weather reasons. The campaign was programmed to end May 31, but was extended to June 3, to take advantage of the weekend to vaccinate in some cantons that still had unvaccinated population. Preliminary data of the campaign reported a national coverage above 95%, which included 7% of foreigners. Men and women were vaccinated in similar proportions, with a slightly greater coverage for men.

By age group, the groups from 15 to 19 and from 35 to 39 years achieved a preliminary coverage of more than 100%. This can be explained because people vaccinated included those that had already turned 15 years of age, as well as those turning 15 years in 2001. Furthermore, it is possible that people were vaccinated and registered with ages outside the range defined for the campaign. The other age groups achieved coverage greater than 95%, except for the 30-34 age group, which obtained 90%.

Given the modality used and the fact that vaccination was initiated earlier in some health areas, at the end of the first week the country had already achieved 31% of vaccination coverage, even though only 3 days had elapsed from the official inauguration date. This figure climbed to 63% and 83% upon the conclusions of the second and third weeks. After having reached the captive audiences and reduced the number of unvaccinated, progress in coverage and the number of vaccinated began to fall as seen in Figure 2.



Source: National Immunization Day's Coordinating Center

* Preliminary data

In all the regions coverage was higher than 95% and some surpassed 100%. Based on the first analyses, the teams of the Metropolitan Area were the ones administering the greatest number of vaccines, which included 18% more people that reside in other regions of the country and 96% of the residents registered in those cantons. In the Central Southern Region, 83% of the population was vaccinated by the teams, which means that an important

proportion of the target population was vaccinated outside its area of influence. The Northern Central Region vaccinated 93% of the population. The regions of Chorotega, Huetar Norte, Huetar Atlántica, Brunca, and Central Pacific vaccinated more than 92% of their target population. The Metropolitan Area, the Central Regions, Chorotega, and Huetar Norte showed the highest values.

The regional levels provided support to the local levels in the definition of strategies at the beginning of the campaign and in the adaptation of these strategies when required. This continuous support was critical to ensure that new concentrations of the population were being taken into account, as well as any geographical barriers and other factors that could hinder vaccination.

Progress toward the achievement of the goal varied for the different establishments, health areas and regions since the strategies that were used for reaching the target population were based on rural conditions, geographical access, and special socio-cultural characteristics of the areas. However, all regions surpassed the goal of the campaign and 75% of the cantons achieved a preliminary coverage of 95% or more.

Lessons learned

Many lessons have arisen from this campaign. They include the satisfaction of having achieved the target vaccination coverage, but also the experiences shared by the working teams at all levels of management.

1. The epidemiological information supported the decision and, together, with technical-managerial components, political and analysis of cost effectiveness, facilitated the involvement of thousands of staff members, social mobilization efforts and the overwhelming response of the population.
2. Inter-sectoral coordination of both public and private institutions was facilitated by the involvement and motivation of thousands of staff members throughout the country and the political support at the highest level within the health sector and that of the Presidency and the Governing Council, which issued an executive decree in support of the national campaign.
3. The need to have a well-defined organization at all levels of management, which allows for flexibility during the process. The active involvement of all managers at every level was also fundamental.
4. Important lessons from the campaign are related to the complexity of mass vaccinating an adult population:
 - The identification of the population of the area of influence and the population to vaccinate including those captive at their workplace and study areas was critical for planning and programming purposes.
 - The use of biologicals, inputs and materials should contemplate the proportion of the population that is programmed as residents in a health area and as captive in others, as well as the number of teams of vaccinators.
 - The use of different strategies for rural and urban

Coverage Rates: DPT-3, OPV-3, Measles, BCG Region of the Americas, 1999 and 2000

Region/Country	DPT		OPV		Measles		BCG	
	1999	2000	1999	2000	1999	2000	1999	2000
Anguilla	96	92	99	94	99	103	99	104
Antigua & Barbuda	99	95	99	96	99	90	n/a	n/a
Argentina	88	80	91	85	97	91	99	100
Bahamas	...	99	...	91	...	93	...	...
Barbados	87	94	86	86	86	94	n/a	n/a
Belize	87	87	84	84	82	82	96	96
Bermuda	...	...	...	...	...	...	...	...
Bolivia	96	89	89	89	99	124	95	95
Brazil	83	98	84	104	90	99	99	116
British Virgin Islands	90	108	92	110	92	110	99	100
Canada	...	...	...	...	...	...	n/a	n/a
Cayman Islands	94	93	94	92	90	89	92	90
Chile	89	97	89	89	86	97	86	101
Colombia	81	74	75	78	76	75	79	86
Costa Rica	93	88	93	79	92	84	83	92
Cuba	94	100	96	104	99	96	99	100
Dominica	99	100	99	100	99	105	99	99
Dominican Republic	83	78	84	67	94	88	90	90
Ecuador	80	89	70	83	74	89	99	119
El Salvador	94	99	93	98	75	97	72	99
Grenada	88	97	87	97	94	92	n/a	n/a
Guatemala	86	95	86	94	93	88	91	97
Guyana	83	88	83	78	87	86	91	93
Haiti	59	59	58	58	85	80	58	57
Honduras	95	94	95	91	98	98	93	101
Jamaica	81	86	80	86	82	88	85	94
Mexico	96	89	96	89	94	96	99	99
Montserrat	99	85	99	85	99	115	99	115
Nicaragua	83	97	93	94	97	104	99	104
Panama	92	98	96	100	90	97	99	114
Paraguay	77	80	74	73	70	92	87	79
Peru	98	98	96	93	92	97	73	93
St. Christopher & Nevis	99	99	99	99	99	101	99	104
St. Lucia	89	70	89	70	95	89	99	91
St. Vincent & Grenadines	95	100	99	104	87	96	99	114
Suriname	...	...	...	...	...	0	...	...
Trinidad & Tobago	90	90	90	90	88	90	n/a	n/a
Turks & Caicos	...	110	...	110	...	130	...	118
Uruguay	91	91	85	85	89	89	99	99
Venezuela	79	77	82	86	79	84	96	99

* Provisional total based on countries reporting

n/a - Data not applicable

... Data not available

Date updated: 12 June 2001

areas adapted to each particular situation and at different moments of the campaigns implementation proved effective. In remote rural areas, activities should begin at the periphery and then advance towards the most populated centers. In urban areas, they should begin at work and educational places and end with door-to-door mop-ups

- The implementation of adequate social mobilization strategies were vital. These should be directed to health workers and the population. Efforts in this area are never too excessive. Various innovative experiences arose during the campaign: the involvement of hospitals and their work with the community, the participation of the education and private sectors, the creativity of staff members in implementing new forms of education and mobilization of the population to be vaccinated, are only some of the examples. Furthermore, of great use were the involvement of medical societies and that of others professions, as well as the active participation of health workers.
- The availability of simple instruments that allow for the registration of the target population by age group, sex and canton of residency; as well as the development and monitoring of indicators, the monitoring of coverage obtained, both that of the registered population, as well as that of the total population to be vaccinated, (including the population that studies or works in the area), helped the reformulation of strategies and the achievement of goals. To this end, the availability of timely partial progress reports was critical.
- The need to respond to specific situations such as: the organization of blood banks in view that the donor population was being vaccinated in a short period of time, vaccination of risk groups, such as

people with HIV/AIDS, chronic diseases and treatments; monitoring of post-vaccination events and the immediate investigation of serious ones.

- For monitoring and evaluation, sketch and maps, graphs of coverage and fast monitoring of coverage in convenience samples of dwellings and workplaces complement the official registry, since they facilitate the identification of unvaccinated groups and contribute to providing qualitative information.
5. This experience demonstrates that it is feasible to implement strategies and recommendations of international health organizations for the accelerated control of rubella and prevention of congenital rubella syndrome.

The success of this campaign, which achieved vaccination coverage above 95%, both in men and in women, had not been possible without the involvement of Costa Rica's citizens, who once again showed their commitment with their health, both individual and collective, their social conscience and high spirit of collaboration. The same can be said about the health sector staff, that worked throughout the country at the various levels of management. Without their enthusiasm, involvement, initiative, and arduous work, the successful culmination of this national vaccination campaign had not been possible.

Costa Rica's health authorities thank the support of the Presidency of the Republic, the Governing Council, the Office of the First Lady, the private sector, the mass media, the Pan American Health Organization, the Centers for Disease Prevention and Control of the United States and all those people and organizations that collaborated in this effort.

Source: Dr. Xinia Carvajal, Vice Minister, Ministry of Health; Dr. Guillermo Santiesteban, Deputy Director, Costa Rica's Social Security and Dr. Mario León, Executive Coordinator of the Campaign, CCSS.

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