Rubella Watch
Compendium of Rubella and Congenital Rubella Syndrome Articles

Editors:
Carlos Castillo-Solórzano, MD, MPH
Cuauhtémoc Ruiz Matus, MD, MPH
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Rubella and CRS articles

Prologue

In 1994, the Member States of the Pan American Health Organization/World Health Organization (PAHO/WHO) adopted the initiative to eliminate measles from the Americas. In 2003, they adopted the initiative to eliminate rubella and congenital rubella syndrome (CRS) from the Region. In order to implement both initiatives, vaccination and surveillance strategies were executed with the objective of rapidly reducing the number of new cases and interrupting endemic transmission of both diseases.

It is my privilege to present this compendium of rubella and CRS articles, designed to tell the story of measles, rubella, and CRS elimination and compiling all the articles published on these diseases in the PAHO/WHO Expanded Program on Immunization (EPI) Newsletter, now the Immunization Newsletter. The objective of the present publication is to document the regional experience. In particular, it aims to convey to countries and other regions of the world the lessons learned, along with experiences gained from other vaccine-preventable disease elimination initiatives and best practices developed. A growing body of knowledge on how to implement these initiatives and achieve the elimination goal has been accumulated over the 15 years of this process.

The compendium also attempts to pay a graphic and written tribute to the legion of men and women—health workers and volunteers—who have contributed to measles and rubella elimination through their work in and with communities, even under unfavorable circumstances. Without their persistence, dedication, and unwavering determination, the initiative could not have moved forward.

The Americas have laid the foundation for the elimination of vaccine-preventable diseases. The experience of the Region in measles and rubella elimination has demonstrated that we can conquer a disease if we work in unison, recognizing the strength of team work and embracing the richness of diversity among people and communities. The pages of this book highlight Pan-Americanism in action, which has promoted continuous exchange and learning between peoples of the Americas.

Finally, this publication contributes to the strengthening of one of PAHO’s institutional principles by which shared information and knowledge is a source of power and serves to improve the condition of all people –pro salute Novi Mundi.

Mirta Roses Pertiago
Director

Preface

The partnership between countries and the international community has played a decisive role in the achievement of immunization goals in the Western Hemisphere. The focus of this partnership has been to support country efforts to build robust and equitable national immunization programs that can effectively control vaccine-preventable infectious diseases and respond to emergency epidemics as these arise. The legacy of this joint collaboration is a Region with the world’s lowest morbidity and mortality rates from vaccine-preventable diseases and one of the largest and most sophisticated network embracing countries, civil society, nongovernmental organizations, bilateral and multilateral organizations, the scientific community, and the private sector.

The proven impact of national immunization programs in the Americas in reducing poor health due to vaccine-preventable diseases has placed immunization goals prominently on the global agenda for sustainable development and poverty reduction. The Region remains a pioneer in generating valuable knowledge and experience in the use of strategies and tactics which continue to benefit immunization programs worldwide. Breakthroughs include critical knowledge in improving managerial capabilities and accountability of public health staff responsible for immunization programs at the national and sub-national levels, even in countries undergoing political and economic hardship.

The EPI Newsletter, established in 1979, has chronicled the history of the successful partnership between the Pan American Health Organization (PAHO), national immunizations programs, and the international community, beginning at a time when vaccination coverage for children under the age of 1 year old barely reached 25%–30% for diphtheria, tetanus, pertussis, polio, measles, and tuberculosis, to today’s coverage of over 90%. The EPI Newsletter has documented PAHO’s critical work with countries in establishing an adequate surveillance, services delivery, and diagnostic infrastructure, and in ensuring the utilization of quality vaccines and the presence of regional production capacity for vaccines of public health importance. The EPI Newsletter has underscored the contribution of the Revolving Fund for Vaccine Procurement, created as part of the Expanded Program on Immunization (EPI) 32 years ago. The Revolving Fund is a public good that has facilitated the availability of high-quality vaccines supplied in adequate quantities, in a timely fashion, and at the lowest prices. Likewise, it has highlighted PAHO’s work with its Members States in the achievement of broad-based community and public-private partnerships that continue to bring us closer to realizing the goal of equitable vaccination.

Immunization programs in the Region are now responding to the rapid technological changes in the field of vaccination brought about by the development of new generations of vaccines of public health importance. These vaccines have the potential to simplify immunization delivery, improve the performance of existing vaccines, and protect against other vaccine-preventable diseases. However, this new breed of vaccines is considerably more costly calling for heightened cooperation among public and private partners alike.

I congratulate the EPI Newsletter, as it celebrates its 30 years, for its efforts to keep us abreast of important milestones achieved by the countries of this Region in partnership with the international community and urge it to continue its strategic role of sharing critical information and knowledge that will enable immunization programs throughout the world to face the challenges that lie ahead.

Socorro Gross-Galiano
Assistant Director
Contributing to the Sharing of Experiences and Continuous Learning in the Americas

Effective knowledge management is essential for improving the efficacy of interventions aimed at increasing gains in health and improving the quality of life of the people of the Americas. The documentation of experiences, lessons learned, and/or good practices in a specific area is a classical example of a public good that has become critically important in a world where booming communication technologies play a dominant role.

This publication is a compendium of all the rubella and congenital rubella syndrome (CRS) articles published in the Immunization Newsletter, taking on the challenge of systematizing the cumulative experience of the Americas in eliminating rubella and CRS. On reviewing the content of this publication, the reader will discover that the vast national and local experiences presented reflects both the diversity of our Region as well as common epidemiological trends, achievements, and challenges of the elimination initiative.

For almost 30 years, timely dissemination of these experiences through the pages of the Immunization Newsletter has enabled health professionals in the countries to develop and strengthen a wide range of capacities. Many of the articles required the collaboration of these professionals, thus helping to improve their skills in analysis, synthesis, and praxis, demonstrating that knowledge derived from the rubella elimination initiative could be applied in daily practice. Scientific writing skills are another competency that was developed, leading to quality improvements in scientific knowledge production in the Region.

Perseverance in the publication of rubella and CRS articles has contributed to the dissemination of knowledge on the elimination of vaccine-preventable diseases to the Member States of the Pan American Health Organization and to strategic partners. The Region of the Americas is facing a changing landscape, and with it, new challenges to the continued promotion of health and equity. It is therefore essential that inspiring instruments, such as this publication, are available to facilitate the implementation of successful health initiatives and to improve the quality of life in the countries of the Americas. I am certain that this publication will provide a public health legacy for present and future generations.

Promoting Equitable Access to Information and Knowledge

For 30 years, the Immunization Newsletter has been the mechanism for disseminating information on best practices and lessons learned from the Expanded Program on Immunization (EPI) in the Region of the Americas. Each of its articles has been testimony to the resolve, dreams, hopes, and achievements of intrepid health workers and communities in their efforts to control vaccine-preventable diseases. Examples of these triumphs are the epidemiological control of measles and rubella, which, through the firm tenacity of the countries of the Americas and the Pan American Health Organization/World Health Organization (PAHO/WHO), the lofty dream of a Hemisphere free of measles, rubella, and congenital rubella syndrome (CRS) is becoming a reality.

This compendium of measles and rubella articles presents historical proof of the joint efforts to eliminate the two diseases, thus revealing the commitment, effort, humanity, and extraordinary technical capacity provided at local and national levels to make elimination possible. It also reflects the Pan American spirit and ideal; through united efforts we have made these achievements possible. We cannot forget that this success is a victory of partnerships.

Today, when the world is discussing the possibility of eradicating measles, documentation of the experience of the PAHO/WHO Member States in measles and rubella elimination represents a wealth of knowledge for the annals of public health, promoting equitable access to knowledge and information to foster evidence based decision-making and best practices. The ability to disseminate and share knowledge has been key to the success of the measles and rubella elimination initiatives in our Region; through communication we have been able to inform, encourage, recognize, and motivate the people of the Americas to remain faithful to their intense commitment to equity and to reach the highest attainable level of health for all by all.

May this compendium serve as homage to all those, who from diverse locations, positions, and responsibilities have managed to make the Americas a measles- and rubella-free hemisphere. This publication will surely foster a heightened awareness of history and a better understanding of the present. Above all, it will better prepare us for a bright future in public health, especially in the control of vaccine-preventable diseases.
Testimony of the First Editor

The Pan American Health Organization (PAHO) Expanded Program on Immunization (EPI) was established by Resolution XXVII of the XXV Meeting of the Organization’s Directing Council, in September, 1977. In May, 1979, the Program published the first issue of what was then called the EPI Newsletter.

Introducing this PAHO periodical publication, the then Chief of the PAHO’s Division of Disease Control, Dr. Luis Carlos Ochoa, stated that the newsletter was “created in response to the suggestions and recommendations of more than 130 nationals from all the Latin American countries that participated in the four regional EPI courses held from May 1978 to January 1979.” He also stated that the purpose of the periodical publication was “to continue the process begun at these courses, of exchanging skills, knowledge and information relevant to the Expanded Program on Immunization in the Region of the Americas.”

The publication, he stated “was intended to create a flow of information in the Region about all aspects of program implementation, from scientific articles on the target diseases and vaccination to practical matters of the day-to-day running of an immunization program.”

And indeed, over the last 30 years this publication, now called Immunization Newsletter has maintained a high standard of scientific quality in all these aspects serving as one of the main vehicles of information to program managers and policy makers.

Most importantly, the newsletter has stimulated program officers, both at the country level as well as members of the EPI staff at PAHO, to strive to collect and analyze information relevant to program implementation and contribute with articles and news that most certainly have helped set and/or modify strategies relevant to the control and eradication of vaccine-preventable diseases in the Region of the Americas. It has also served as a forum for the discussion of issues and ideas that helped improve the quality of national programs, as well as created an esprit de corps or group morale, among those involved with the program.

I want to take this opportunity to congratulate the entire staff of immunization programs throughout the Region and those at PAHO for the outstanding work that has been developed over these last 30 years, and that have been reflected in the quality of the publication.

Finally, I pay tribute to the Editors and Co-Editors that have followed after my tenure, as well as all the contributors to the various issues of the newsletter, for maintaining the same spirit that guided the launching of this important periodical publication.

Through Information Exchange, Cultivating a Culture of Prevention

In the 32 years since the Expanded Program on Immunization was launched in the Americas, polio has been eradicated and measles has been eliminated. Perhaps more importantly, thousands of health workers working at the point of service have been trained in the principles of good public health practice and prevention. These same health workers have consistently executed the necessary strategies to reduce morbidity and mortality of vaccine-preventable diseases. Improving management of immunization services at district-level is the cornerstone of their work.

The foundation of good public health practice that the vision for future public health improvements rests.

Critical for the progress achieved and this vision of the future has been the sharing of information and experiences between countries. To that end, we believe the EPI Newsletter subsequently renamed the Immunization Newsletter, has played a vital role in the documentation of strategies and tactics that are successful in reducing the disease burden of vaccine-preventable diseases. Continuously improving the way we manage information should also lead to increased knowledge and improved behavioral practices.

While protecting and sustaining the achievements in polio and measles initiatives, the program is poised to complete and sustain the elimination of rubella and congenital rubella syndrome (CRS). Like polio, CRS causes life-long suffering for children and their families. Efforts to reach and vaccinate adults should impact women’s health given that rubella elimination has reached those who are marginalized and otherwise do not benefit from preventive services.

Ultimately, the future of immunization will hinge upon how well we leverage inter-disciplinary partnerships, and how well we share our experiences in reducing existing health disparities. New, life-saving vaccines must be made available to those who need them most. Within the next 10 years as many as 10 new vaccines may become available. We now have vaccines for prevention of human papillomavirus infection and cervical cancer, but they are not accessible to our communities in need at their current prices. As these vaccines are introduced, PAHO’s role will be to ensure that they are made available in a sustainable fashion to those who need them most, in particular the poor, the underserved, and the marginalized populations of our hemisphere. To that end, the Immunization Newsletter will continue to be ready and willing to support health program services in all Member States of the Pan American Health Organization.
Rubella Watch

Pan American Health Organization

Rubella Experience in the US

The 1964–65 epidemic of rubella in the United States led to approximately 20,000 births affected with the congenital rubella syndrome (CRS). An estimated 30,000 stillbirths, and resulted in an estimated 5,000 therapeutic abortions. The cost to the U.S. economy was about $1.5 billion.

In 1969 three rubella vaccines were licensed and a national rubella immunization program was developed to distribute and administer vaccine. Since 1969 rubella vaccine has been used widely and more than 100 million doses have been distributed. Currently, only the RA 27/3 strain of rubella virus is distributed in the U.S. RA 27/3 was licensed in 1979 and has replaced the earlier rubella vaccines.

Use of vaccine has led to a dramatic decline in reported cases of rubella. Compared to the 75,576 cases reported in 1969, the 2,077 cases reported in 1981 represent a 96% decrease and an absolute low of reported cases of rubella (Figure 1).

No major epidemics have occurred since 1964 and the previously noted six to nine-year cycles of peak rubella activity have been interrupted (Figure 2).

Initial efforts in the U.S. program were directed towards vaccinating young children of school age since it was thought that the primary transmission of rubella occurred in school age children. As a result, there was a change in the epidemiology of rubella, with peak disease occurrence shifting to the 15–19-year-old age group during the mid to late 1970’s. Approximately 71 percent of reported rubella cases from 1976 through 1979 occurred in persons 15 years of age or older.

The reported incidence rate of congenital rubella syndrome has not declined as markedly as that of rubella (Table 1). Because the change in the epidemiology of rubella and the continuing occurrence of CRS, emphasis was subsequently given to vaccinating susceptible post-pubertal women. This has now resulted in a decline in the age-specific incidence rate of rubella in 19–29 year olds, and although it is too early to know with certainty, there appears to be a decline in the CRS incidence rate.

Concern about vaccinating a woman who may not know she is pregnant is an obstacle to the implementation of rubella vaccination programs. In the United States, pregnancy is recommended as the interval for rubella vaccination. See Table 2 for data on the risk of rubella-induced malformation which is very low or nonexistent.3

Since 1941, 8 percent of young adults are still susceptible to rubella in the postvaccine era, outbreaks of rubella continue to be reported in settings where persons congregate, including schools, universities, hospitals and other places of adult congregation. The prevention of nosophem rubella has been described and continues to be achieved given to developing guidelines for immunization of all susceptible hospital personnel.

Benefit-cost estimates of current U.S. rubella immunization practices have a minimum ratio of 8:1 when rubella vaccine is given alone and 23:1 when it is given in combination with measles vaccine.

In summary, the U.S. program has reduced transmission among young school children, eliminated the cyclic periodicity of rubella occurrence, and prevented the occurrence of rubella with resultant congenital rubella. It has not been as successful in reducing endemic CRS however, with the continued aggressive use of rubella vaccine and vaccination of susceptible adolescents and women of childbearing age, it may be possible in the near future to eliminate CRS and perhaps rubella.

Information on pregreration can be obtained by writing to the Chief, International Studies Branch, Fogarty International Center, Building 16A, Room 205, National Institutes of Health, Bethesda, Maryland 20205 (USA).

Table 1. Reported incidence rates of acquired rubella and confirmed and compatible cases and estimated rates of reported congenital rubella syndrome (CRS). United States, 1963–1981.

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<th>Year of birth</th>
<th>Overall incidence rate/100,000 pop</th>
<th>Incidence rate/rubella vaccined</th>
<th>Conformed and compatable cases</th>
<th>Rate/rubella vacineed</th>
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<tr>
<td>1969</td>
<td>28.9</td>
<td>62</td>
<td>-</td>
<td>1.8</td>
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<tr>
<td>1970</td>
<td>27.8</td>
<td>69</td>
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<td>1.8</td>
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<tr>
<td>1971</td>
<td>21.9</td>
<td>45</td>
<td>0.7</td>
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<tr>
<td>1972</td>
<td>12.2</td>
<td>32</td>
<td>1.0</td>
<td>1.0</td>
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<td>1973</td>
<td>5.6</td>
<td>22</td>
<td>0.7</td>
<td>0.7</td>
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<tr>
<td>1974</td>
<td>7.5</td>
<td>21</td>
<td>0.7</td>
<td>0.7</td>
</tr>
<tr>
<td>1975</td>
<td>5.8</td>
<td>23</td>
<td>0.7</td>
<td>0.7</td>
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<tr>
<td>1976</td>
<td>8.4</td>
<td>26</td>
<td>0.8</td>
<td>0.8</td>
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<tr>
<td>1978**</td>
<td>5.4</td>
<td>47</td>
<td>1.6</td>
<td>1.6</td>
</tr>
<tr>
<td>1980**</td>
<td>1.7</td>
<td>1.0</td>
<td>14</td>
<td>14.0</td>
</tr>
<tr>
<td>1981**</td>
<td>0.9</td>
<td>0.4</td>
<td>7</td>
<td>7.2</td>
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**Cases per 100,000 population estimated by extrapolating age distribution of cases with known age to overall number of cases.

(1) Continued cases are those with definite and laboratory evidence of congenital rubella. Congenital cases are defined as only two complications from list below, or one from each of two separate complications from list below:
- Cardiac/congenital glaucoma (either or both can occur), congenital heart disease, loss of hearing, pneumonia, respiratory.
- Purpura, opthalmomy, jaundice (both onset beginning 2.6 mos. after birth), microcephaly, infantile retardation, meningitis/pneumonia, rheumatoid factor.

(2) Pertains to cases of birth (22,000,000), hospitalization, and institutionalization.

(3) Provisional data.


Global Advisory Group Addresses Rubella Control

The World Health Organization’s (WHO) Expanded Program on Immunization (EPI) Global Advisory Group (GAG) met from October 14 to 18, 1981 in Antalya, Turkey. The conclusions and recommendations of the meeting were several and attest to the congenital rubella syndrome (CRS) control.

Despite the insufficient data available regarding the epidemiology of rubella and CRS in the developing world, WHO is aware of an increase in the interest to introduce rubella-containing vaccines in this area. There are three basic approaches to rubella control: universal vaccination of young children, or the selective vaccination of pre-pubescent school girls and young adult women, or a combination of the two. The first strategy strives for interruption of transmission of the rubella virus, whereas the second seeks to protect women during their childbearing years. Whatever the interruption of transmission through high coverage from birth to age 9 years. The same time as measles vaccine may appear attractive, there are several potential risks associated with such a strategy. If coverage is not sufficient to interrupt transmission but merely shifts the age-specific infection rate to older age groups then the potential exists for more cases of CRS than would have occurred in the absence of vaccination.

On the other hand, the combined strategy may be harder to implement due to inherent difficulties in immunizing the target populations and the inefficiency of vaccinating those who may already be immune.

The GAG recommended that WHO promote research on the epidemiology of rubella and CRS in developing countries and define specific guidelines that would assist countries considering the introduction of rubella control strategies.

Introduction of MMR or rubella vaccines in any immunization program should be within a strategy that aims primarily at the prevention of CRS. Therefore, universal immunization with MMR should be avoided in developing countries. Very high coverage can be assured and vaccination of post-puberal females is recommended except in the preferred strategy for those countries wishing to embark on a rubella control program, selective vaccination is an option, with an emphasis on high risk groups (postpubescent females).
Rubella and CRS articles

1993

August 1993, Volume XVI, Number 4

English-Speaking Caribbean Rubella Policy

A survey was conducted in 1992 to determine the status of rubella immunization in the English-speaking Caribbean and an impression of its impact on children and congenital rubella syndrome. Questionnaires were sent to each of the 20 English-speaking Program Managers, all of whom responded. The following report outlines the results of the survey and subsequent recommendations.

Policy
Ten of the 19 countries stated that they had an agreed national policy on rubella immunization. Several of them were using some form of rubella vaccine. Four countries were using MMR vaccine administered to children aged one to two years and four others were also using other vaccine containing rubella, the extent of which was difficult to establish.

Recommendation: All countries should establish an agreed national rubella immunization policy.

Strategy
The ideal rubella strategy aims to interrupt virus transmission among young children and to ensure that any adult women who might be exposed to rubella are already immune.

The second objective involves either screening and vaccinating women or immunizing susceptibles or routine immunization of women of child-bearing age. Both options can be linked to pregnancy (prenatal screening, postpartum immunization).

Additionally, rubella vaccine can be given to all girls at puberty. Barbuda and BVI had the best developed rubella policies, involving mu-

Recommendation: National policies should aim to interrupt rubella transmission and to ensure that women of child-bearing age are immune to rubella.

The Extent of Rubella Infection during Pregnancy

Only nine of the 19 replies considered that women were aware of the risks of rubella infection during pregnancy. In one country it was routine for a pregnant woman with a rash to be tested properly for rubella infection, although such testing may be carried out in eight other countries. It would not be undertaken in 10 countries.

Barbados was able to identify 19 laboratory-confirmed rubella infections during pregnancy and two rubella-associated terminations in the 1986-1991 period. Over the same period, there were 24 known cases of congenital rubella syndrome reported from 12 countries.

Recommendation: Health education should be directed toward alerting women to the importance of rubella during pregnancy and mechanisms should be set in place so that any pregnant women with rashes can be appropriately investigated.

The Extent of Rubella in the English-Speaking Caribbean

Rubella is a notifiable disease in 15 of the 19 countries. Between 1986 and 1991, 2,321 cases were reported by 12 countries. The number of cases per country varied from 2 to 1,162 cases. Seven countries did not report any cases of rubella. Of all the cases reported, 307 were confirmed by laboratory testing. There can be little doubt that rubella continues to circulate in the English-speaking Caribbean and it is likely that there is considerable under-reporting.

Figure 1. Rubella Cases and Incidence Rates: English-Speaking Caribbean and Suriname. 1992-1993

1994

February 1994, Volume XVI, Number 1

Measles Campaign Improves Anti-Rubella Coverage

One of the major objectives of the EPI objectives is improving the coverage of critical childhood diseases. The EPI has now acquired widespread acceptability among both its consumers and providers, as its adequate infrastructure already exists for the delivery of vaccine.

Within the current context of a very limited financial and human resources, it is essential to carefully examine the selective immunization strategies for rubella.

Rubella and Congenital Rubella Syndrome in the USA

Indigenous rubella and congenital rubella syndrome (CRS) have been targeted for elimination in the United States by the year 2000. From 1969 through 1989, the numbers of annual reported cases decreased 99.6% for rubella and 97.4% for CRS. Following a slight resurgence during 1990-1991, the number of reported rubella cases reached record lows during 1992-1996 (annual average: 183 reported cases). Findings indicate sustained low incidence of rubella and CRS since 1992 and possible interruption of transmission of rubella virus in late 1996.

Rubella: During 1994-1996, a total of 32 states, the District of Columbia and New York City reported 567 rubella cases. Based on provisional data as of 18 April

Conclusions

• Rubella is still present in much of the Caribbean.

• There are and will continue to be outbreaks until susceptibles are identified and immunized.

• There are cases of congenital rubella syndrome. The life-time costs of children who suffer multiple handicaps as a result far exceed the costs of preventing congenital rubella syndrome.

• Surveillance of rubella and its impact is not strong and could be improved.

• Although many countries are pursuing a policy to interrupt rubella transmission among young children, they have not made efforts to protect all susceptible adult women.

• Women did not appear to be sufficiently aware of the risks of rubella during pregnancy, nor was there adequate investigation of cases of pregnant women with rashes.

Source: Dr. D. M. Salisbury MB BS FRCP. Principal Medical Officer: Department of Health, London, UK.

1997

June 1997, Volume XIX, Number 3

Rubella and Congenital Rubella Syndrome

The Ministry of Health of CARICOM primer in “Rubella in the Caribbean” in 1996, summarized results of a subsequent rubella transmission from the Caribbean. By 1996, 52% of the female population was immune to rubella by adolescence and young adulthood, notable exceptions were detected in a study of certain islands and isolated populations where fewer women possess rubella antibodies when compared to women from urban areas.

Serum samples were randomly obtained at the B1 government health centers and hospitals across Trinidad and Tobago from 2003 pregnant women. Rubella was most likely to be present when the IgM antibody to rubella was tested using an Enzyme Linked Immunosorbant Assay (ELISA test). Of the 1838 effective samples taken, 986 (54.6%) antenatal clinic attendees were found to possess IgM antibody to rubella.

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Rubella Watch

1997, symptom onset for the last case in 1996 was 6 November and for the first case in 1997 was 22 August, representing approximately three incubation periods with no reported rubella cases. Of the 505 (89.1%) cases with known importation status, 471 (93.3%) were independently acquired, and two (0.4%) were imported from another state. Of the internationally acquired cases, country of exposure was reported for 15 (46.9%): Mexico (five cases); Brazil (two), Argentina (two), Colombia, England, Germany, Korea and Switzerland (one each).

Congenital Rubella Syndrome:

A total of 12 infants with laboratory-confirmed CRS were born during 1994-1996. Nine reports noted seven indigenous acquired cases, four imported cases, and one case with unknown importation status. The maternal exposures for the four imported cases occurred in Mexico (two cases), Sri Lanka (one), and Dominican Republic (one) – countries that do not routinely provide rubella vaccination. Of the seven infants with indigenous acquired CRS, four were born to women of Hispanic ethnicity. Of the 370 mothers for whom vaccination status was available, seven had one or more reported opportunities for vaccination.

In recent years, outbreaks of rubella have occurred primarily in settings where young adults congregate, and the risk has been the highest among persons who are often unvaccinated and who may be exposed to persons traveling from areas where rubella vaccination is not routine.

The increasing proportion of cases accounted for by persons aged 15-44 years indicates that vaccination programs targeting school-aged children has been successful in preventing rubella in that age group, but that cases are still being reported with the pre vaccina­tion era, and the low annual average number of cases since 1991. Elimination of rubella will further require:

- maintenance of high vaccination levels in preschool and school-aged children and young adults.
- intensification of diagnosis and efficiency of surveillance for rubella and CRS.
- prompt control of outbreaks.

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Rubella and CRS articles

Public Health Burden of Rubella and CRS

This article is the first of a series focusing on the public health importance of rubella and congenital rubella syndrome (CRS) in the Americas and worldwide. In April the Caribbean Community established the goal to eliminate rubella by the year 2000 (EPI Newsletter, June, 1998). The following article discusses the public health burden of rubella and CRS. A future article will address the characteristics of rubella vaccine and adequate vaccine strategies for rubella and CRS elimination.

The recorded history of the rubella virus dates back to the mid-18th century when it was first described by German authors as Röteln. Until the early 19th century, rubella was still known as the “third disease,” a variant or combination of measles and/or scarlet fever. In 1814, Dr. George Maton further investigated a rash illness diagnosed as “scarlatina.” He came to the conclusion that the disease did not fit the description of any known disease.

In 1864, after extensive investigation, the diagnosis of a new condition was recognized as congenital rubella syndrome. In 1881, Dr. Norman Todd described the “group primarily affected with congenital heart disease.” He also noted that the group primarily affected with congenital rubella was young mothers because older women were more resistant to the virus. He asked the question which sparked interest and focus on rubella and CRS: “what can we do to prevent a repetition of the tragedy in any future epidemic?” He also made a suggestion that has withstood the test of time and continues to be repeated today, “we must recognize and teach the potential dangers of such an epidemic.” Unfortunately, Dr. Gregg’s observations did not immediately receive the attention it deserved.

It was not until the 1960’s, with the rubella pandemic of 1962-1965, that the world became fully aware of the damage that rubella could cause. The morbidity-mortality rates in the United States alone were astonishing. In 1964-1965, there was an estimated 12.5 million acquired rubella cases. As for the consequences of infection during pregnancy, there were over 11,000 reported abortions (spontaneous and surgical) and approximately 20,000 infants born with CRS, of whom 2,100 died in the neonatal period. Of the CRS infants, almost 12,000 reported deafness, 3,580 blindness, and 1,800 were mentally retarded. An example of a city that suffered greatly is New York. The number of children born with the greatest impairment, 5% of births in the city. This may have been due to high population density and immigration. The epidemic took a financial toll on the country as well. The estimated cost of this epidemic is estimated to have been over US$ 800 million.

The ultimate outcome was the recognition of the significance of CRS. In 1966, rubella and CRS became reportable on a national basis in the United States. Rubella vaccination must be a disease primarily for children with the highest susceptibility rate among 5-9 year olds. The greatest number of total annual rubella cases, 57,886, was reported in 1965. Throughout the following decades, communities continued to reduce the incidence of CRS. In 1980, more than 6,000 students with hearing impairment due to CRS were enrolled in special programs throughout the country.

As for financial costs today, in the English-speaking Caribbean, it was estimated that expenditures for care and rehabilitation of 1,500 CRS cases expected to occur over the next 15 years would be approximately US$ 60 million. The lifetime cost of treating one patient with CRS in the United States today is estimated to be over US$ 200,000. Direct annual national cost for care of persons with multiple rubella defects was estimated in 1985 to be US$ 90 million.

The figures recorded and documented are not highly accurate due to the problem of underreporting. Factors contributing to this underreporting are 1) 10-20% of rubella cases are subclinical, 2) in the case of mild symptoms, no medical care is sought, and 3) symptoms are not highly specific and sporadic cases frequently go unrecognized by physicians.

Susceptibility is an indicator of the likelihood of an outbreak. Epidemiological observations suggest that outbreaks may occur when rates are high.

In the 1980’s some Latin American countries reported relatively high susceptibility rates (30-60%) among women of childbearing age. In Mexico, where rubella is not included in the Health Ministry’s Universal Vaccination Program, results of studies testing seroprevalence showed the assumption that women living in lower socio-economic areas and rural areas are less likely to be immune than those in urban settings. This is due to the fact that those in areas of low population density are less frequently exposed to the virus. These studies suggest that CRS is an under-recognized public health problem and improved CRS surveillance is necessary.

In the Caribbean, rubella epidemics occurred annually between 1989-1991. From 1991 to 1995, there was decreased reporting. There was a resurgence occurred in 1995 in some countries in the

August 1998, Volume XX, Number 4
Rubella Watch EPI Newsletter

1983-2009

1999
February 1999, Volume XII, Number 1

Evaluation of the Bahamas’ MMR Campaign

From July to December of 1997, the Bahamas carried out its first mass measles, mumps, and rubella campaign (MMR) targeting the population between the ages of 4 to 40 residing in 19 islands. National and Grand Bahama account for 68% of the total population in the Bahamas. The objectives of the campaign were to reach as many individuals as possible with these live virus vaccines, interrupt rubella virus transmission and prevent further cases of congenital rubella syndrome (CRS), by eliminating susceptible populations for rubella, as well as eliminating susceptible populations for mumps infection. Since the campaign, no cases of measles and rubella have been reported, in spite of the fact that the blight of rubella infection continues to visit tourists every year. In July of 1998, the Ministry of Health of the Bahamas, through the PAHO/VI, carried out an evaluation of the MMR campaign. Given the shortage of manpower, the campaign was extended up to May, 1998, in an attempt to reach the entire target population. The following is a summary of the evaluation report.

Measles and Rubella Situation

In 1996 the country’s fever and rash surveillance system identified one case of rubella; since then there have been 13 laboratory-confirmed cases of the disease. During 1998 four women gave birth to babies with congenital rubella syndrome, three of which died from multiple congenital defects (MCDF) before the children reached 1 month of age. In an attempt to prevent the introduction of the virus and protect infants from MCDF, the Bahamas also reported its first laboratory confirmed cases of CRS in seven years due to an imported rubella case. In order to prevent outbreaks of both measles and rubella, the Ministry of Health conducted an MMR campaign between July and September of 1997. Mop-up operations were carried out during the months of October and December, 1997. The MR campaign targeted the adults (both female and male) between 4 and 40 years on the 19 family islands. All persons were immunized, except those individuals with a documented history of two doses of MMR vaccine and/or medical contraindications. Evaluation of the campaign for the MMR campaign was initially 180,980 (1995 midyear projec-tion), but after 3,273,830 doses of MMR vaccine were adminis-tered, the number was adjusted to 153,180. Approximately, 80% of the target popu-lation or 122,844 are in the workforce, and 30,296 (20%) are in the age group 4 to 14 years.

October 1998, Volume XXI, Number 5
Rubella Vaccine and Vaccination Strategies

One of the consequences of the devastating rubella epidemic in West Germany in 1964-1966 and the United States in 1964-1965 was extended research and progress towards the development of a rubella vaccine. Following isolation of the rubella virus in 1962 by Parkman and Amerin in Washington D.C., and Weller and Neva in Boston, three rubella vaccine strains were initially licensed in the United States in 1969. These were soon replaced by the vaccine now used throughout the world, the RA 27/3 rubella vaccine. This vaccine was developed by Dr. Stanley A. Plotkin between 1965 and 1967 at the Wistar Institute in Washington D.C.. The RA 27/3 vaccine was licensed in the United States in January 1978.

The vaccine is a weakened live rubella virus and produces immunity by mimicking natural rubella infection. It is attenuated by 25-30 passages in tissue culture. The result being virome and pharyngeal excretion, however, are of a much lower magnitude than natural infection, and are noncommunicable. Rubella vaccination induces IgM and IgG antibody responses. The long-term presence of either antibody eliminates the possibility of viremia and pharyngeal excretion, however, are of a much lower magnitude than natural infection, and are noncommunicable. Rubella vaccination induces IgM and IgG antibody responses. The long-term presence of either antibody eliminates the possibility of viremia and pharyngeal excretion, however, are of a much lower magnitude than natural infection, and are noncommunicable. Rubella vaccination induces IgM and IgG antibody responses. 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The campaign was carried out in four phases: Phase I: targeted postnatal mothers; Phase II: targeted adult women aged 17 to 49 years of age, who were graduating from high school in June, 1999; Phase III: targeted workers and postnatal mothers; Phase IV: targeted schools (40% of the target population).

Table 1. Coverage of the Vaccination Surveys

<table>
<thead>
<tr>
<th>Age group</th>
<th>Population target</th>
<th>Population vaccinated</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-14 years</td>
<td>30,296</td>
<td>29,218</td>
<td>96%</td>
</tr>
<tr>
<td>15-24 years</td>
<td>50,564</td>
<td>51,122</td>
<td>65%</td>
</tr>
<tr>
<td>Total</td>
<td>80,860</td>
<td>79,950</td>
<td>98%</td>
</tr>
<tr>
<td></td>
<td>153,180</td>
<td>103,190</td>
<td>67%</td>
</tr>
</tbody>
</table>

The denominator has been adjusted to account for the number of persons with documented history of having received two doses of MMR vaccine.

Thirteen Technical Advisory Group Meeting

The Thirteenth Technical Advisory Group Meeting on Vaccine-Preventable Diseases (TAG) was held in Ottawa, Canada, 17-20 March 1997. TAG meets every two years or as functions as the leading forum to promote regional initiatives aimed at controlling and eradicating vaccine-preventable diseases. During the Ottawa meeting emphasis was placed on the need to highlight the role that infection control practices play in reducing the incidence of vaccine-preventable infections. The impact can be further increased if countries find the means to introduce other vaccines in a sustainable way. The following are some of the TAG’s conclusions and recommendations.

Rubella and CRS

Rubella virus continues to circulate freely in most countries of the Region. After a complete investigation, many suspected measles cases were found to be rubella. Moreover, cases of Congenital Rubella Syndrome (CRS) have been found in all countries of the Region that have established CRS surveillance systems. This suggests that CRS is a major public health problem in all the countries of the Americas.

Vaccination Strategies

All countries should incorporate rubella-containing vaccine into childhood vaccination programs. Rubella-containing vaccine should be routinely included in vaccination programs. In the Americas, a sharp increase in attack rates has been observed in children and adolescents. A new emphasis on enhancing routine vaccination and improving vaccination coverage results in lower attack rates. This is a result of improved coverage as well as improved monitoring and communication through routine immunization and campaigns since the introduction of MMR vaccine.

As of June, according to case distribution by region, Costa Rica’s central area reported 83% of the country’s total. 70% (51%) cases were from the Southern Central region and 18% (28%) cases were from the Northern Central region. Many cases were found among persons living in these areas, especially factory workers and market vendors.

In response to the outbreak, the country’s Ministry of Health implemented a vaccination campaign using MMR vaccine between the end of March and the beginning of April (week 13). The selective campaign targeted adults, placing priority on women of child-bearing age (15-44 years). As a result of the campaign, there has been a remarkable reduction in the number of cases reported (Figure 1).
The campaign utilized the mumps/rubella vaccine (vaccine strain Wistar RA 27/3). There were approximately 6,000 vaccinated, working from 4,000 vaccination posts, as well as from private posts and those organized by the Armed Forces. An intensive communications campaign through radio, television and the press was carried out prior to the campaign.

Current data indicate that the use of rubella vaccine during pregnancy is safe, presenting no risk of infection for the fetus. However, Chile’s rubella vaccination followed international recommendations and decided that pregnant women would not be vaccinated. (Refer to EPI Newsletter of June 1999, for recommendations of PAHO’s Technical Advisory Group on Vaccine-Preventable Diseases on rubella vaccination during pregnancy.)

The estimated target population for the whole campaign was 2,507,448 women between the ages of 10 and 29 years. For the second phase, the target population is 153,173 women, who are to be vaccinated during the next 10 months following the mass campaign. Results obtained are based on data received from Chile’s Epidemiology Department and of women vaccinated through September 10.

The success achieved can be attributed in part to the high-level of consciousness of women about their own health and that of their families. Moreover, the success can also be attributed to the efficiency, effectiveness and commitment of the health teams involved in the campaign and the clear and precise messages disseminated by the mass media.

The total number of women vaccinated was 2,467,924. Based on age group the numbers were as follows: between 10 and 14 years, 701,605 (102%); between 15 and 19 years, 1,517,202 (97%); between 20 and 24 years, 547,479 (92%); between 25 and 29 years, 616,987 (102%); Women between 20 and 24 years show the lowest vaccination coverage at the national level, with 92%. This group has the highest birth rate, therefore, a greater percentage of them would have been pregnant at the time of the first vaccination phase. This means that a greater proportion of women were vaccinated during the second phase, proportionally to this age group.

The Ministry of Health implemented a surveillance system with the following objectives:
1. To provide information on the effectiveness of the campaign and policies, to measure the impact on the occurrence of rubella and CRS;
2. To collaborate in identifying groups of geographic areas where additional control efforts are needed to reduce disease incidence, and establish the vaccine effectiveness, duration of vaccine-induced immunity, as well as other aspects related to the efficacy and safety of the vaccine.

Source: Summary of the report on the Strategy for the Prevention of Congenital Rubella Syndrome in Chile. For a complete version, contact: X. Aguilar; A. Guzman; C. Ramírez; M. González; H. Ochia; M. Chuy; V. Sotomayor; D. Ulloa; H. Giorgi; and V. Child at the Department of Epidemiology, Ministry of Health, Mac-beer 541, Santiago, Chile.
A refrigerated centrifuge is not a requirement.

- The pellet should be immediately re-suspended in 0.5 to 2 ml of viral transport media (VTM).**
- In the field, centrifuged urine and nasopharyngeal swab specimens can be re-
  frigerated at 4°C for up to five days until they can be stored in a –70 or –40°C freezer.
- As soon as possible, the sample should be sent to a laboratory equipped with a –70 or –40°C freezer. Because of the rapid degradation of the viruses, samples should never be kept at –20°C.
- When samples are ready to be tested, they should be shipped in dry ice packages.
- In such a case, the surveillance team, in collaboration with the public health govern-
  ment or vaccine provider, should decide which samples to test for measles.

** VTM should be made available to all laboratories by the national laboratory

IV. Information regarding the samples:

- Informed consent should be obtained from the patient.
- Full address and accompany biological specimens within five days from the day it was taken.
- In the case of a nasopharyng-
  eal swab, the sample should not be centrifuged. It should be placed in a sterilized tube with 0.5-2 ml of VTM.

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In response to the threat for rubella epidemics, the resulting CRS burden and the current endemic course of the disease, the XIV Technical Advisory Group Meeting on Vaccine-Preventable Diseases (TAG) was held in Foz do Iguaçu, Brazil, October 2-5, 2010. TAG meets every year and functions as the principal forum to promote regional initiatives aimed at controlling and eradicating vaccine prevent-

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- When samples are ready to be tested, they should be shipped in dry ice packages.
- In such a case, the surveillance team, in collaboration with the public health govern-
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** VTM should be made available to all laboratories by the national laboratory

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Rubella Watch

Volume XXIII, Number 1

Rubella Watch

Figure 2. Distribution of rubella cases and attack rates by age group. Costa Rica, 1990

1. Rubella surveillance should be completely integrated with the EPI service. All sera from suspected measles cases which test negative for measles IgM antibodies should be tested for rubella IgM antibodies and vice versa.

2. Rubella surveillance should be initiated throughout the Americas in order to detect CRS cases in children under one year of age. Countries should follow the case definitions for surveillance, which were adopted at the 1999 TAG meeting. It is not necessary to routinely confirm CRS in older children.

3. A single serum specimen is generally considered adequate to either confirm or discard a rubella infection.

4. Countries should improve the collection of samples for virus isolation in outbreak situations. Nasopharyngeal aspirates or swabs are the preferred specimens for rubella virus isolation and should be collected within four days of rash onset. This will provide important information concerning the virus sub-types that are currently circulating in the Region.

5. National programs should actively promote the collaboration with the medical sector (especially obstetricians, neonatologists and pediatricians) to enhance rubella/CRS surveillance and vaccination efforts.

Costa Rica Embarks on Accelerated Rubella and Congenital Rubella Syndrome Program

Background

Costa Rica introduced rubella vaccination into the national vaccination schedule in 1972. No rubella cases were observed in the first two decades due to the low coverage of the vaccination program. It was only in 1984 that vaccine coverage of approximately 80% was reached. In 1998, an epidemic of rubella was declared in the country. The magnitude of CRS in Costa Rica also became evident in the preliminary results of a study aimed at consolidating measles eradicating and ensuring rubella and CRS prevention.

The Plan incorporates the following strategies:

- Intersectoral activities closely with the education and labor sectors.
- Social mobilization with the community as well as political, union and religious leaders, community associations, presidents of student federations, representatives of secondary education, artists, entrepreneurs, local non-governmental organizations, and the media.
- Integrated management between the Ministry of Health and CCSS.
- Planning and management of the country’s health service networks.
- International cooperation for effective resource mobilization.
- International cooperation for technical assistance and resource mobilization.

A National Commission of Immunization chaired by the Health Minister is directing the Action Plan, and a Commission will assess the results and CRS surveillance system. As part of the vaccination campaign component, the Commission will oversee the areas of logistics, cold chain and immunization safety, mass media, social communication, social participation, system of registries, staff training and supervision. For the epidemiological surveillance, two working teams will focus on strengthening measles and rubella monitoring, as well as the development and implementation of a CRS surveillance system.

The national campaign will be coordinated with the regional and local epidemiology and vaccination commissions throughout the entire country. Social mobilization is expected to be widely used. Activities have included:

- Identification of needs of the different organizations at the community level (municipalities, schools, trade, church, and local organized groups).
- Identification of national personalities that should participate in the social communication efforts during vaccination campaigns.
- Preparation and dissemination of a mass media proposal for the campaign.

This initiative represents a joint effort of national health institutions represented in the Ministry of Health and the CCSS, specialized agencies and the international community. The Pan American Health Organization and the Centers for Disease Control and Prevention are providing financial and technical support.

Source: For more information regarding this initiative, please contact Dr. Ximena Cervantes, Minister of Health, Ministry of Health, and Dr. Guillermo Gutierrez, Director of the CCSS, Social Security Administration.

Editorial Note: Together with the efforts of the English-speaking Caribbean countries and Chile, the initiative of Costa Rica’s Ministry of Health and its Social Security Administration will generate useful knowledge and experience for the development of strategies for rubella and CRS prevention and control in the Americas, and for their eventual eradication. The March of Dimes Birth Defects Foundation has renewed its support to PAHO's regional activities to control and eventually eradicate rubella and congenital rubella syndrome with a grant in the amount of US$ 200,000 for 2001-2002. The first agreement was signed in 1999, PAHO has been collaborating with countries on the development, implementation and monitoring of strategies aimed at the control of rubella and prevention of CRS; support in the implementation of a regional surveillance system for rubella and CRS; strengthening of the collaboration with the regional Measles Laboratory Network to carry out rubella and CRS surveillance; and analysis of rubella and CRS surveillance, which includes the preparation of regular surveillance reports and contributions to scientific publications.

During the upcoming phase emphasis is being placed on monitoring the rubella and CRS surveillance system; the implementation of strategies to reduce the number of rubella and CRS cases; collection of samples for viral isolation from every outbreak and development of virus isolation capabilities; as well as the promotion of appropriate vaccination strategies.
Rubella and CRS in the Americas

For 2000, data on rubella obtained from many countries in the Americas indicated that some countries had a high disease burden despite efforts to control the disease. In the United States, the endemic population increased in 2000 due to an increase in the number of cases in the eastern United States. In Canada, the number of cases decreased in 2000, with the exception of Ontario, where the number of cases increased. In Mexico, the number of cases decreased in 2000, with the exception of the Federal District, where the number of cases increased. In the Caribbean, the number of cases increased in 2000, with the exception of Jamaica, where the number of cases decreased. In the American Samoa, the number of cases remained constant in 2000.

The World Health Organization (WHO) strongly recommends the use of MMR (measles, mumps, and rubella) vaccine on the grounds of its cost-effectiveness and efficacy. The combination vaccine is recommended rather than monovalent presentation when available because the disease burden justifies its use.

There has been no new scientific evidence that would suggest impaired safety of MMR. On the contrary, all results from vaccine trials point to the high safety and efficacy of MMR vaccine.

Background: Measles, mumps, and rubella are major killer children mainly in developing countries, accounting for approx. 875,000 deaths each year. Howevem, recent outbreaks in industrialized countries have highlighted the importance of improving measles immunization coverage throughout the world. Congenital rubella syndrome (CRS) is an important cause of deafness, blindness, and mental retardation. It is estimated that more than 1 million cases of congenital rubella syndrome occur each year worldwide. Mumps is a serious infectious disease. Although the disease is mild, up to 10% of patients can develop aseptic meningitis; a less common but more serious complication is encephalitis, which can result in death or disability. These three communicable diseases can be prevented through immunization.

Source: World Health Organization

April 2001, Volume XXIII, Number 2

Institute of Medicine (IOM) Committee Rejects Causal Relationship Between Measles-Mumps-Rubella Vaccine and Autism Spectrum Disorder

A public briefing on Monday, April 30, the Institute of Medicine’s (IOM) Committee on Immunization Safety Review released a report in which they conclude that the evidence favors rejection of a causal relationship between the measles-mumps-rubella (MMR) vaccine and autism spectrum disorder, commonly known as autism. The Committee concluded that:

- the epidemiological evidence shows no association between MMR and autism;
- case studies based on small numbers of children with autism and bowel disease do not provide enough evidence to draw a conclusion about a causal relationship between these symptoms and administration of the vaccine;
- biological models linking MMR and autism are fragmentary;
- there is no relevant animal model linking MMR and autism.

Therefore, the Committee recommended maintaining the current policies relating to licensure and administration of the MMR vaccine in the United States. The Committee Chair, Marie C. McCormick, M.D., Sc.D., professor of maternal and child health at the Harvard School of Public Health, stated at the briefing that while no vaccine is 100% safe, the MMR vaccine is as safe as a vaccine can get.

The Committee reviewed published and unpublished material, and also heard testimony from a variety of witnesses, including Dr. Andrew Wakefield, the author of a well-publicized study published in The Lancet in 1998. This study seemed to indicate that the onset of autism and gastrointestinal problems were associated with the receipt of the MMR vaccine. Dr. McCormick noted that the Wakefield study was published as an observation without further follow-up and never claimed to prove the relationship. She further noted that the Committee reviewed numerous studies that examined Wakefield’s hypothesis and were unable to find evidence to support it.

Current research on autism has established that there is a strong genetic component to the disease; however, the Committee notes that “other factors, including infectious, neurologic, metabolic, genetic, and environmental insults, may play significant roles.” Therefore, although the Committee felt that a relationship between MMR vaccine and autism would be extremely rare, if it occurred at all, they recommended that research to examine this possible relationship continue.

The IOM’s Committee on Immunization Safety Review was convened in Fall 2000 to provide an independent review and assessment of increasingly prominent vaccine safety concerns. It will examine vaccine-safety hypotheses over the next three years. The 15 Committee members have expertise in pediatric infectious disease, internal medicine, immunology, neurology, infectious diseases, epidemiology, biostatistics, public health methodology, epigenetic, decision analysis, nursing, genetics, ethics, and health communications. To prevent any perception of conflict of interest, anyone with financial ties to vaccine manufacturers or their parent companies, and anyone who had served on vaccine advisory committees, provided expert testimony, or published papers on the issue of vaccine-safety hypotheses, was excluded from participating on the Committee.

Source: Institute of Medicine, April 24, 2000

June 2001, Volume XXIII, Number 3

Progress and lessons learned from Costa Rica’s rubella campaign

As a result of the epidemiological surveillance, vaccination 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 15-19 years, regardless of their immunization status (EPI Newsletter, February 2001).

The definition of vaccination coverage 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 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 dense population, vaccination began in hard-to-reach areas followed by urban areas. Several tactics were used to ensure reaching diverse population groups, such as mobile posts that called to gather at strategic locations, the use of bridges, housing complexes, 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, metropolitan centers, urban areas, outskirts, irregular human settlements, as well as known gathering points, such as supermarkets, shopping centers, churches, transportation terminals, and agricultural fair and vaccination centers.

• A field team composed of health workers went from door-to-door vaccination using maps to ensure vaccination of the entire population, in the area, and to identify pockets of unvaccinated or vacci-

nated groups. Given that the target population consisted of teenagers and young adults, this activity was preferably carried out after 4-0.00 PM. In some areas, mop-up activities were also conducted.

• During the last weekend, an additional opportunity for vaccination was implemented 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 of 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... vaccinate 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, via local media, and 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

Rubella and Autism: What is the Relationship? (13 of 13)
participation of health institutions and that of other sectors, such as government and non-governmental 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 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 actions and thus 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 national and local 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 on-going 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" were 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 officially initiated May 2, and was extended to June 31, 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, which was slightly greater coverage for men.

By age group, the groups from 15 to 19 and 25 to 39 years achieved a preliminary coverage of more than 100%. This can be explained because people aged 25 to 39 years included those that had already turned 15 years of age, as well as those that were aged 15 years in 2001. It is possible that people were vaccinated and registered with ages outside these definitions for the campaign. The other age groups achieved coverage greater than 95%, except for the 30–34 age group, which obtained 90%.

In 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 94% 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, Hueta Norte, Huetar Atlántica, Bruncora, and Central Pacific vaccinated more than 98% of their target population. The Metropolitan Area, the Central Regions, Chorotega, and Hueta 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 in others, as well as the number of teams of vaccinators.
2. The use of different strategies for rural and urban 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.

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 clear involvement of Costa Rica’s citizens, who once again showed their commitment to their health, both individual and collective, their social conscience and high spirit of collaboration. Also, Costa Rica is said about the health sector staff that worked throughout the country at the various levels of management. Within their enthusiasm, involvement, initiative, and arduous work, the successful campaign of this national vaccination campaign would not have been possible.

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

**Rubella Vaccination of Women of Childbearing Age in the Americas**

In 1983, the Technical Advisory Group (TAG) on Vaccine Preparations of the Pan American Health Organization recommended developing appropriate vaccine strategies for the Americas in order to reduce the number of susceptible women of childbearing age (NCBWA) to rubella in response to the potential for major rubella outbreaks and ongoing incidence of congenital rubella syndrome.

Left to right: Dr. Rogelio Färn Falta, Minister of Health; Dr. Miguel Ángel Rodríguez, President of Costa Rica; Lenna Faco de Rodríguez, First Lady; Dr. Rubenito Pina Roque, Executive President of the Costa Rican Social Security Fund and Dr. Philippe Lamy, PAHO Representative in Costa Rica.
Specifically, TAG’s recommendations state that:

- Countries wishing to prevent and control CRS promptly should conduct a one-time mass campaign to vaccinate all females 9–19 years of age with measles and rubella containing vaccine.
- Countries wishing to prevent and control both rubella and CRS promptly should conduct a one-time mass campaign to vaccinate both males and females 9–19 years of age with measles and rubella containing vaccine.

In an effort to reduce the risk of rubella infection in women of childbearing age, the United States, Canada, Cuba, Chile, Costa Rica, Panama and Uruguay are using measles/mumps/rubella vaccine (MMR) for many years, thereby protecting large cohorts of WCBAs. Brazil, Colombia and Honduras have scheduled vaccination against rubella in the postpartum period, and Mexico has initiated vaccination among risk groups (Figure 1).

Rubella vaccination campaigns in the framework of accelerated rubella and CRS programs are being implemented. CARICOM established in 1998 the goal to embark on a national mass vaccination campaign in the framework of CRS programs; are being implemented. CARICOM embarked on a national mass vaccination campaigns aimed at both men and women between the ages of 15–39 years. The Latin American Federation of Obstetrics and Gynecology agreed on the following recommendations:

- The Chaper of Obstetrics and Gynecology in each country must seek the political and financial commitment of their government in support of an accelerated rubella control and CRS prevention.

On 23 August 2001, the President of the Latin American Federation of Obstetricians and Gynecologists (FLASOG) met with the presidents of each chapter in the countries of Latin America, to discuss the participation of the Region’s immunization activities during the postpartum period, and Mexico has begun vaccinating risk groups.

In 1998, countries of the Caribbean community (CARICOM) announced an initiative for the elimination of rubella and the prevention of CRS in the countries of the English-speaking Caribbean. In September 1999, Chile implemented a mass rubella immunization campaign targeting women between the ages of 10–29 years and, in May 2001, Costa Rica completed a mass rubella campaign on a national level, targeting both men and women between 15–19 years of age. The Ministry of Health and the Social Security System of Costa Rica (CSSS) adopted a strategy of accelerated rubella control and prevention of CRS, and carried out a one-month National Mass Vaccination Campaign against rubella and measles, targeting men and women between the ages of 15–39 years.

The Latin American Federation of Obstetrics and Gynecology has also recommended that:

- The subject of vaccination of women during pregnancy be discussed with women who have contracted rubella.
- The Perinatal Information System (SIP 2000) is an appropriate tool for the notification of CRS cases. It includes information regarding the immunization status of the mother, rubella diagnosis, either laboratory confirmed, or clinically diagnosed, and complications for maternal pregnancy, or, if exposed to the disease, congenital malformations, hepatoencephalopathy, and purpura.

- As part of surveillance, confirmation by laboratory is essential for rubella and CRS diagnosis.
- The subject of vaccination of women of childbearing age and efforts during pregnancy must be introduced during national and international OB/GYN meetings.
- PAHO must update and widely disseminate all available information regarding immunization during pregnancy.
- The Chapters of Obstetrics and Gynecology must participate in the elaboration of national immunization committees of their respective country.
The rubella and congenital rubella syndrome elimination initiative has provided an opportunity for the American people to join forces in order to reach isolated and disadvantaged populations and offer them the gift of vaccination. The initiative has represented a genuine expression and an unforgettable reminder of the best of what Pan-Americanism has to offer and of what we can achieve thanks to the consensus and leadership of PAHO Member States.
Rubella and CRS articles

Immunization managers were given a presentation by Costa Rica’s entire multidisciplinary and educational team, who were involved in the planning and organization of the campaign. They also visited health establishment authorities and members of the health system who had taken place (representatives of health posts, hospitals and clinics).

Here they were able to review all the technical and management aspects that can play an important role during the implementation of the campaign. Finally, immunization managers met with the Costa Rica’s Congress, which had oversight responsibilities over the vaccination and control of contagious diseases, to disseminate in a final report and scientific journals.

April 2002, Volume XXIV, Number 2

Brazil accelerates control of rubella and prevention of congenital rubella syndrome

Background

Pre-eruption studies for rubella antibodies conducted in Brazil from original outbreaks in early 1990s laid the groundwork for the implementation of Brazil’s rubella vaccination strategies. Serologic testing conducted in Fortaleza (Rey CL, et al) in 1997 revealed that the most susceptible group among pregnant and post-partum women were those 15 to 39 years of age (39%).

The introduction of MMR (measles/mumps/rubella) vaccine or MVE (measles/rubella) vaccine to the basic immunization schedule in Brazil was initiated in 1992. Technical criteria considered for its introduction included: DPT and/or measles vaccine 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 main analysis of rubella as a public health problem became known. Between 1993 and 1995, almost 50% of the cases in which measles was ruled out were subsequently diagnosed as rubella (with 70% of the cases 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 (11.8 per 100,000), followed by children aged 10 to 14 in 1999/2000, the incidence in the 1- to 4-year age 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 increase in the transmission of the virus toward susceptible young adults is related to the gradual introduction of the rubella vaccine, and the 95% vaccination coverage achieved in the 1 to 11-year age group in most Brazilian States between 1992 and 1999.

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 Sul. As the proportion of cases (61%) in adolescents and young adults. Two of the States in which these outbreaks occurred were characterized by accelerated rubella control and CRS prevention as a control measure. In Paraná, a campaign was carried out in 1998, targeting 1.7 million women between the ages of 15 and 39 years and reaching 97% coverage of 86%.

A campaign in Rio Grande do Sul was carried out in September 2000, with the goal of vaccinating over 750,000 women between the ages of 12 to 49 years reached by mobile vaccination teams of 72%. Prior to the introduction of the vaccine in Brazil, a study carried out by Salerno R, et al. (1997) supported the need to attribute to CRS in 3% of children under 15 years of age. In another study (Hardy GV, et al) in the following years 15-20 women (with post-partum care) of the labor hospital were vaccinated with acetylsalicylic acid, 4% of the cases were attributed to CRS. In 1996, CRS was added to the list of notifiable diseases in Brazil. Following the rubella outbreak 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 were reported, and 132 were confirmed during that same period. The number of CRS cases rose from 38 in 1997 to 78 in 1998, 73 confirmed, given the underreporting of such cases, these numbers continue to rise. In 1999, 2000, the incidence 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 MMR vaccination (live vaccines in the same preparation of measles, mumps, and rubella) in districts with high rubella incidence (RA27/3 strains) to accelerate the prevention of rubella.

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, Pará, Pernambuco, Sergipe, Rio de Janeiro, Minas Gerais, São Paulo, Goias, Amazonas, Halaquis, Maranhão, Rondonia, and Acre. Each State determined the age group to be vaccinated, utilizing the following variables: (A) Vaccination coverage and year of MMR or MVE introduction (the 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 the corresponding annualized incidence 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 Committee for Rubella Immunization. Overall, the age group targeted for vaccination varied between the years 19 to 29 age of women. However, some States have adjusted the target age group.

Planning

Planning: Estimates of the target population in the 5 provinces developed by looking at institutions and places with large concentrations of people, such as universities and factories, 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 high density of community health agents (PACS and Family Health Program (PSF) are being immunized. These urban and rural target population groups were also identified. Based on the population of the municipalities and the influence of the consolidated population, every locality established its own-time-table 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 and municipal Secretariats of the National Commission of Nurses, The Communication and Advertising Initiative and the National Foundation of Health/FUNASA. Among the main tasks of these awareness-raising efforts were: (A) to understand the campaign’s objectives, and (B) to mobilize institutions with State and municipal governments.

A technical arm of these committees included regional advisors on examinative diseases and technical staff from the areas of immunization, epidemiological surveillance, and prevention of respiratory diseases, representatives of national reference laboratories, and the associations representing the health professionals. This team closely monitored the schedule and plan to ensure reaching a high vaccination coverage. Critical were also the campaign’s inter-sectorial coordination efforts, where health teams collaborated in this effort: the National Confederacy of Women, non-governmental organizations 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 be both effective, informative, and guide the adult population, which had little or no awareness of its relation to rubella virus, the existing, high rubella infection rate and the severity of the disease. National and State health teams participated in the public awareness campaign to convince women who had not been vaccinated, to get immunized, in order to protect the health of other women. In this regard, the mass media was used by health authorities and their efforts throughout the campaign have been monitored to determine the impact. Other media used were social awareness campaigns in the population included messages on public bulletin boards, television and radio programs. Public awareness messages were developed to clearly point to the location and time of the vaccination campaign. The public was to carry their vaccination cards during the month of the campaign to be inoculated and 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 were answered. Inoculation campaigns (36%), what to do if a pregnant woman was inadvertently vaccinated (14%), and another hot line was used. The nation teleconference was also held at each stage of the campaign to answer the objectives, as well as technical and organizational aspects, issues related to vaccine safety, and in constant contact with health professionals.

Vaccination tactic: 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, and businesses, as well as supermarkets, shopping centers, bus and train stations, and ports and major highways. In the last two weeks of the campaign, house-to-house visits targeted women of childbearing age who were likely to be home. At the same time, in areas where the PSF was operating, vaccination was conducted by conducting 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 define the main obstacles and population groups that had not been vaccinated. The findings were used to inform the re-definition of the campaign’s strategies, placing greater emphasis on public awareness campaigns and participation of managers at the different levels, and rapid monitoring to enhance service delivery and guarantee homogeneity.

Criteria used for monitoring vaccination coverage included: neighborhoods with high density of women; major work centers, remote areas with poor access to vaccination services (indigenous areas, 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 thus far untargeted, and to design effective means of reaching them. Emphasis was placed on those areas where possibilities that had failed to obtain 95% vaccination coverage. This painstaking local effort during the final stage 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 suspected adverse events. Similarly, to reduce the risks to health workers and the community of blood borne infections, the dangers of 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 inadvertent recipients of the vaccine and for whom it was not appropriate. Of the 545 women who were 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 and conducted in 13 States has reached a vaccina- tion coverage of 9.3% of a target population of over 15 million women of childbear- ing age. Municipalities that failed to reach coverage over 95% have conducted a mop-up vaccination among unvaccinated groups that were identified through rapid vaccination monitoring. 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 19 years will be vaccinated in 11 States - Rio Grande do Sul, Santa Catarina, Mato Grossso, Acre, Pará, Pará, Roraima, Amarapoa, Tocantins, Bahia, Ceará, and Piauí. The campaign is scheduled to begin between 15 June and 5 July 2002, and will include the vaccination of more than 300,000 pregnant women.

Some states, like Bahia, Ceará, and Piauí, have already vaccinated more than 98% of all women who are 9 years of age or younger, and 100% and Bolivia and reported 42% (800) cases (all of them for a rate of 1.6 per 1,000 women). It should be noted that these countries are those that have integrated measles and rubella surveillance systems, and from 5 countries in 2001 (Argentina, Colombia, Ecuador, and Nicaragua). Thus, 5 countries reported cases of laboratory-confirmed rubella in WBCA with no information on their pregnancy status during two years of study.

A total of 50 women were reportedly pregnant during this rubella infection. These women were reported from 9 countries (Bolivia, Brazil, Colombia, Dominican Republic, Ecuador, El Salvador, Guatemala, Mexico, Nicaragua, and Peru) and from 5 countries in 2001 (Argentina, Colombia, Ecuador, El Salvador and Guatemala). Thus, 5 countries reported cases of laboratory-confirmed rubella in WBCA with no information on their pregnancy status during two years of study.

**Lessons learned:**

First two years of regional rubella surveillance – An analysis of national rubella data

During the last two years, national immuniza- tion programs began expanding their measles surveillance systems to include cases sus-pected of being rubella and, in many instances, began to include all febrile rash ill- nesses into their systems. The regional measles database (MESS) developed by PAHO for measles notification, was also expanded to reflect the changes in surveillance activ- ities. Variables were added for more relevant aspects of rubella infection, e.g., pregnancy status, and classification codes were modified to allow a suspected case to be con- firmed as rubella. An analysis is presented in the first two years of regional rubella surveil- lance data that were sent to Washington via weekly transmissions of surveillance data from national databases. For the purposes of this analysis, only labora- tory-confirmed cases were included.

**Analysis of the MESS database:**

The MESS database shows that important numbers of women in child-bearing age in WBCA, especially in Bolivia, were unvaccinated and had laboratory-confirmed infec- tions with rubella. Unfortunately, information on their pregnancy status was not uniform, collected, or at least was not uni- formly reported. In year 2000, 70% of 703 women (19% of all cases of age of year with confirmed rubella infections, information on their pregnancy status was not re- ported. Thirty-nine (50%) of the 703 women were reported to be pregnant while the remaining 41% (50%) were not being pregnant. Of the 1,194 women in 2001 with rubella in- fection, 223 women were pregnant in 2001, with the remaining 15% of all cases of age of year with confirmed rubella infections, information on their pregnancy status was not re- ported. Forty-one (41%) of 223 women were reported to be pregnant while the remaining 41% were not being pregnant.

**Final comments:**

The surveillance data from 11 countries, the potential for major rubella outbreaks in the Region, PAHO’s 1997 Technical Advisory Group on Vaccine-Preventable Diseases (TAVG) addressed the need for the implementation of a regional initiative to strengthen rubella control and congenital rubella syndrome (CRS) prevention efforts. At the time, the initiative included the introduction of a rubella-con- taining vaccine (MR or MMR) in the national child- hood immunization programs; vaccines of women of childbearing age; the development of specific vaccination strategies for the accelerated rubella control and CRS prevention; the develop- ment of integrated syndromic surveillance systems for measles and rubella; the implementation of a CRS surveillance system; and support for enhanced laboratory capa- bilities in rubella virus isolation.

In 1986, sixteen years after licensure of the rubella vaccine, six countries (the United States, Canada, Cuba, Panama, Costa Rica) had intro- duced MMR vaccine into their childhood programs. It was only largely achieved through the implementation of two mass vaccination campaigns in 1985 and 1986, initially targeting young women and children with a rubella-containing vac- cine, Cuba was the first country to eliminate rubella virus from the community in 1989, and the last rubella case reported in 1995. This goal was largely achieved through the implementation of two mass vaccination campaigns in 1985 and 1986, initially targeting young women and children with a rubella-containing vaccine.
Rubella and CRS articles

women aged 18 to 30 years, and subsequently children aged 1 to 14 years.

At the 1999 TAG held in Canada, an accelerated rubella control and CRS prevention strategy was developed for the Americas, which followed the experience of the English-speaking Caribbean countries and Cuba in adult mass vaccination campaigns against rubella. The strategy rests on the combination of vaccination of adult men and women, coupled with rubella vaccine introduction into national childhood immunization programs. This combined vaccination strategy seeks to achieve rapid reduction of rubella virus circulation, while preventing the shift of disease burden to susceptible young adults, particularly women of childbearing age, thus, avoiding the incidence of CRS. The principal rationale of an accelerated

Lessons have been gained in the mass vaccination of heterogeneous population groups that have been difficult to reach. In Costa Rica for example, 42% of the population (1.6 million), which included men and women, were vaccinated within the timeframe of one month. The mass vaccination of 28 million women in Brazil against rubella has further provided important lessons on the vaccination of large population groups. All of these countries have used the MR vaccines with the exception of Chile, which used the rubella vaccine in its single presentation.

The experience of the English-speaking Caribbean countries and Cuba has also provided useful insights on the cost-benefits of immunizing against rubella infection. These studies show that the benefits of accelerated control

Human Development (CLAP) and the Congenital Malformation Latin-American Collaborative Study (ECLAMC). Information collected includes: history of exposure to rubella, clinical illness during the mother's pregnancy, vaccination status of the mother, as well as laboratory confirmation of maternal rubella and any congenital malformations, herpato-spleno-megaly and purpura in the newborns.

As countries in the Americas embark on the accelerated control of rubella, documenting the endemic strain in each country will be critical in determining whether the case is imported or not. As with prevention initiatives, countries should establish rubella importation surveillance systems. The surveillance of rash cases of rubella is circulating. Emphasis should be placed on laboratory confirmation of all suspected rubella cases.

Rubella vaccination strategy is to reduce the time it takes to interrupt rubella virus circulation and prevent CRS occurrence. Most countries in the Region have already implemented routine childhood rubella vaccination, and this strategy is protecting children as they reach their first year of life. Nevertheless, this vaccination strategy is likely to take over 20 years to control CRS, as several cohorts of childbearing women will remain susceptible to rubella virus.

Cuba’s experience and that of the English-speaking Caribbean countries have helped shape the strategies that have been used in the Region, following the 1997 TAG recommendations as presented in the Final Report.

Figure 1. Countries Using Rubella Vaccine in National Immunization Programs, 1997 and 2002

Vaccination strategy is to reduce the time it takes to interrupt rubella virus circulation and prevent CRS occurrence. Most countries in the Region have already implemented routine childhood rubella vaccination, and this strategy is protecting children as they reach their first year of life. Nevertheless, this vaccination strategy is likely to take over 20 years to control CRS, as several cohorts of childbearing women will remain susceptible to rubella virus.

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rubella campaigns. The combination of the two RCMs is recommended for use as a rapid reduction in disease burden to which has resulted from the implementation of an accelerated rubella control strategy, combined with the extensive experience gained by the Region in vaccinating large and heterogeneous populations, the availability of a safe, affordable and efficacious vaccine, the evidence on the cost-effectiveness of eliminating rubella, and the ample support provided by the public and health authorities from countries, have paved the way for the decision to establish the goal of rubella and CRS elimination in the Americas by the year 2010. During its June session, PAHO’s Executive Committee endorsed the goal of rubella and CRS elimination by 2010 and urged countries to draft national plans of action within one year, and for the Director of the Organization to elaborate a regional plan of action and mobilize resources in support of the rubella/CRS elimination goal.

Recognizing the important breakthroughs in the fight against vaccine-preventable diseases to protect the children of the Region made possible through the close partnership of the Member States and the international development community; Noting with great pride the sustained collective efforts by the Member States in fulfilling the goal of interruption of indigenous measles transmission in the Western Hemisphere; Considering the remarkable progress and experience gained by the Region in vaccinating large and heterogeneous populations, the availability of a safe, affordable and efficacious vaccine, the evidence on the cost-effectiveness of eliminating rubella, and the ample support provided by the public and health authorities from countries, have paved the way for the decision to establish the goal of rubella and CRS elimination in the Americas by the year 2010. During its June session, PAHO’s Executive Committee endorsed the goal of rubella and CRS elimination by 2010 and urged countries to draft national plans of action within one year, and for the Director of the Organization to elaborate a regional plan of action and mobilize resources in support of the rubella/CRS elimination goal.

Taking note of the spirit of solidarity and Pan Americanism in the Region made possible through the first Vaccination Week in the Pan American Health Organization
Health sector reform and concerned with the fluctuations negative impacts of certain immunization services to high-risk including disease surveillance activities.

**RESOLVES:**

1. To urge Member States to: a) encourage the establishment of a specific line item for immunization in their national budgets and the timely allocation of financial resources to avoid shortages, and operational costs; b) inform the finance ministers and senior budgetary decision-makers about the benefits of sustaining immunization programs, as well as the unforeseen results from pockets of low immunization coverage; c) implement health sector reform and decentralization policies and programs in a manner that safeguards the achievements made in immunization; d) support the implementation of an annual hemispheric Vaccination Week, to be held in April, targeting high-risk population groups and underserved areas; e) maintain the Region free of indigenous measles through high, routine (>95%) measles vaccination coverage by municipality or district, and follow-up measles vaccination campaigns at least every four years, timely surveillance, and outbreak investigation and control; f) obtain high (95%) and homogenous vaccination coverage by municipality or district for all antigens; g) eliminate rubella and congenital rubella syndrome (CRS) from their countries by the year 2010, to accomplish this, they are requested to draft the respective national plans of action within one year.

2. To request the Director to: a) elaborate a regional plan of action to mobilize resources in support of a rubella/CRS elimination goal by 2010; b) continue advocating for an active mobilization of national and international resources to sustain and expand the investments made in immunization programs by the Member States; c) foster joint action by the International Monetary Fund, the World Bank, and the Inter-American Development Bank and Member States to increase the countries of health and finance, to establish provision within the public budgets that ensure the uninterrupted allocation of funds to national immunization programs; d) promote the annual hemispheric Vaccination Week to improve equity in immunization.

**Andean and Southern Cone Sub-Regional Meetings on Vaccine-Preventable Diseases, 1-3 September 2003**

The XIII Meeting of the Andean Region countries and the XVII Meeting of the Southern Cone countries on Vaccine-Preventable Diseases were held as a joint event in Lima, Peru during 1-3 September 2001. PAHO has been promoting these sub-regional meetings for two decades to evaluate progress in controlling vaccine-preventable diseases. This article summarizes the final report and recommendations regarding the elimination of rubella and congenital rubella syndrome.

**Elimination of Rubella and Congenital Rubella Syndrome**

Since the introduction of the rubella vaccine in the Region and the implementation of the strategy for accelerated rubella control and the prevention of congenital rubella syndrome (CRS), rubella virus circulation has decreased. Forty-two of the Hemispheric’s 44 countries and territories currently include the rubella vaccine in their national vaccination schedule. Every country in the Andean and Southern Cone Sub-Regions includes the MMR vaccine in its national program and the MR vaccine in follow-up campaigns to maintain measles elimination.

The main reason for adopting the accelerated vaccination strategy for rubella is to reduce the time required to interrupt the circulation of rubella and prevent CRS. With the introduction of the rubella vaccine alone, it would take more than 20 years to achieve what has already been achieved in countries such as Uruguay. According to the data sent by the countries, major cohorts of women of childbearing age (WCBAs) are susceptible to rubella.

**Recommendations**

- Once the goal of eliminating rubella and CRS has been set, each country should draw up a plan of action for elimination, and if the plan is not immediately feasible, it should be done in stages, always vaccinating both sexes.
- Programs should plan carefully to guarantee a timely supply of vaccines needed for admission campaigns.
- Countries should continue efforts to improve vaccination strategies to reduce the number of rubella susceptibles and improve surveillance for rubella cases for the major challenges posed by the elimination of rubella and CRS, among them: 1. Rubella surveillance should be fully integrated with measles surveillance; this will enable countries that are just beginning to implement the elimination strategy to know where the virus is circulating and allow countries that have already implemented the strategy to detect and confirm every case. In outbreaks, the first five cases in each chain of transmission should be laboratory-confirmed.
- Vaccination strategies to prevent circulation of the rubella virus should continue to be implemented. This will lead to a reduction in CRS through a single mass campaign in which both men and women are vaccinated. Education is crucial in the second stage of this strategy.
- Age groups to vaccinate should be determined by the epidemiology of rubella in the country. Nevertheless, the target groups should include boys and girls who have not been vaccinated as part of the routine program—that is, children aged 5 years and adults of both sexes. The upper age limit should be based on documented fertility patterns and the expected susceptibility.
- Countries should investigate and follow all women infected with rubella during pregnancy, providing thorough perinatal evaluations of their newborns.
- Program managers should ensure that all sera from suspected cases of measles that are negative for IGM measles antibodies are assayed for IGM rubella antibodies.
- Greater emphasis should be placed on developing the logistics to guarantee the collection of maternal rubella virus isolation as well as the adequacy and proper shipping of the samples.
- CRS surveillance should be improved in all of the countries of the Region, identifying the use of the laboratory using the Perinatal Information System (IAPA 2000) of the Latin-American Center for Fertility and Human Development (CLAP) and the Latin American Collaborative Study on Congenital Malformations (ECLAMC) to facilitate implementation.

**Caribbean EPI Managers’ Meeting 17-20 November 2003**

The 20th Meeting of the Caribbean EPI Managers was held in Curaçao, Netherlands Antilles, from 17-20 November 2003. The meeting brought together over 60 health officials from 25 countries of the English-speaking Caribbean, Suriname, the Netherlands Antilles, Aruba, the French Departments of Guadeloupe, Martinique, and French Guiana, the United States and the US Virgin Islands, Canada, and the United Kingdom. Several Netherlands Antilles Representatives were present. PAHO Immunization Staff and Trinidad and Tobago as staff from the Caribbean Epidemiology Center (CAREC) and the Caribbean Program Coordination Office (CPC) also attended.

**Achievements in the Sub-Region**

Control of vaccine-preventable diseases remains exemplary in the countries of the English-speaking sub-region, and all should be congratulated on their efforts. No measles cases were confirmed up to week 47 2003 despite careful surveillance, and there were no confirmed rubella cases in 2002 and 2003 to date (see Figure 1). The last case of CRS occurred in 1999 in Suriname.

More than 90% of the countries in the sub-region are providing a two-dose MMR schedule. The countries must measure coverage of each dose and calculate the number of children who have received one or two doses, one dose, or no doses of vaccine. Coverage for the second dose of MMR must be 95% or greater to prevent the accumulation of susceptibles. If there are significant numbers of susceptible children who have not been protected by the second dose, then a further catch-up campaign must be conducted. The same for measles and rubella, importation still remains the greatest risk for re-emergence.

Seventeen of 21 countries have completed and submitted laboratory inventories, and only one laboratory (CAREC) holds material potentially infectious for wild polioviruses. AFP rates have remained constant and there has been improvement in indicators such as timeliness and completeness of specimen collection. These meetings must be maintained.

**Challenges**

Integrated measles and rubella surveillance must be strengthened, especially for women who acquire rubella during pregnancy. The proportion of clinical specimens that were received within 5 days is still very low and must be improved. If the first specimen is
Perspectives on Measles and Rubella Elimination Initiatives in the Region of the Americas

Background

During the 38th Meeting of PAHO’s Director, held in September 1999 in Washington, D.C., the Ministries of Health of the Americas unanimously approved the Measles Eradication Plan of Action calling for the eradication of measles by the year 2000. The hemiplegic transmission of indigenous measles transmission has been achieved as a result of intensified vaccination efforts guided by surveillance activities and the active search of cases in health centers, schools, and high-risk communities. The meeting in November 2002 of the Technical Advisory Group (TAG) on Vaccine-preventable Diseases recognized that the full implementation of PAHO’s recommended strategy for measles eradication, endorsed by all Ministries of Health in all countries of the Americas, has remained the cornerstone of the efforts in interrupting indigenous measles virus transmission.

Eradication Strategies

As part of the measles eradication goal, the development and/or improvement of national surveillance capabilities is a priority due to the changing epidemiologic landscape in the Americas. Countries have developed strategies to control rubella and prevent CRS. Data from the measles surveillance system confirmed widespread circulation of rubella in many countries. This was further documented by data collected throughout the Region by integrated measles and rubella surveillance systems. Accordingly, all two countries have introduced measles, mumps, and rubella (MMR) vaccination into their routine immunization schedule. The remaining two countries, the Dominican Republic and Haiti, have been planning to introduce the rubella vaccine into their regular programs in 2004 and 2005 respectively.

Integration of measles and rubella surveillance is a major tool to meet the challenge of rubella and CRS elimination. Other strategies involve vaccinating both men and women, improving the follow-up of pregnant women who contracted rubella or had contact with a rubella case during pregnancy, and collecting samples for viral isolation.

Activities and Opportunities

Data suggest that the last indigenous confirmed case of measles was reported in November 2002. Taking into consideration the historic achievements in measles elimination, PAHO’s 44th Directorial Council passed Resolution CD44/R1 in September 2003 urging Member States to eliminate rubella and CRS by the year 2010.

For the current year, El Salvador, Ecuador, Colombia, and Nicaragua have programmed mass vaccination campaigns targeting both men and women. Mexico will continue with its vaccination activities according to risk groups. Brazil, a country that has already conducted vaccination campaigns targeting women, will begin routine rubella vaccination efforts among men. In 2005, Argentina, Bolivia, Paraguay, and Peru will conduct vaccination campaigns targeting men and women. In 2006, Guatemala, Venezuela, the Dominican Republic, and Haiti will conduct their own campaigns (see Figure 1).

Rubella elimination by 2010 presents many opportunities. It contributes to the strengthening of surveillance and health services directed at newborns. It allows for improved services and follow-up for children born with congenital malformations and handicaps. It helps build bridges between children health services and special education services. If ever, central health authorities will need to increase national budgets for supervising and monitoring the work of district authorities.

As a by-product of the measles initiative, national immunization programs and surveillance infrastructure have been greatly strengthened. National health authorities are determining the required infrastructure to conduct surveillance for other vaccine-preventable diseases of public health importance such as hepatitis B, Haemophilus influenzae type b, yellow fever, and most recently rotavirus.

The endorsement of a regional vaccine initiative by all Heads of State in the Americas has placed PAHO’s technical cooperation with countries in the area of immunization and vaccines at the highest political level. PAHO collaborated with several partners in the Region, including the First Ladies of the Americas on the goal of measles eradication from the Americas; the countries’ legislative branch to establish laws that ensure national financing of recurrent costs of vaccines and other inputs; the private sector to ensure their inclusion into immunization and surveillance activities; and municipal governments to guarantee the implementation of immunization programs.

In 2003, the importations of the measles genotype H1 from Asia into Chile and Mexico underscored the real risk of importations of measles in countries with low measles immunization programs. The importation to Chile failed to result in secondary transmission, and demonstrated high population immunity, clearly due to the impact of the measles elimination initiative in the Americas. The countries of the Americas also face challenges at risk for importations and subsequent outbreaks. The data from Mexico suggest that the importation of measles virus did not result in widespread transmission, largely due to high coverage.

To reduce the risk of widespread transmission after importation, as happened in Venezuela in 2002, countries must maintain high levels of measles vaccination coverage in all municipalities. Monitoring measles vaccination coverage in all municipalities and targeting those with <90% coverage for special vaccination activities remain essential strategies in all countries (see Figure 2). That is why the focus on the implementation and maintenance of high-quality surveillance, will be the first line of defense to prevent widespread transmission when importations occur.
Rubella and CRS articles

Figure 2. Proportion of municipalities with measles coverage ≤95% among children aged 1 year. Region of the Americas, 2002

Revision of the plans of action for the elimination of rubella and congenital rubella syndrome in the Region of the Americas

A workshop was held on 28 January 2004 in Quito, Ecuador, to review the plans of action for the elimination of rubella and congenital rubella syndrome in the Region of the Americas. EPI Managers, professionals in charge of epidemiological surveillance, and members of PAHO’s Immunization Unit met to measure progress to date and standardize the actions to be carried out. Countries were divided into four groups according to their progress level:

- Group IB: Countries that introduced rubella vaccine 20 years ago.
- Group IIA: Countries that have conducted immunization campaings (men and women) to eliminate rubella.
- Group IIB: Countries with partial immunization campaigns (by cohort, by gender, by risk group, or by geographical area).
- Group III: Countries that have yet to conduct immunization activities towards rubella elimination.

The participants reviewed the development, monitoring, and evaluation of the plans of action. The forecasting of vaccine needs and the vaccine procurement process through the Revolving Fund were two other components examined.

Countries agreed to prepare national plans for rubella and CRS elimination before 28 February 2004 in order to comply with the requirements of Resolution CD44/1R adopted during PAHO’s 44th Directing Council. The plans of action will serve as tools that managers can use to prioritize, coordinate, and implement activities. They will also help managers to better forecast the demand in MR/MMR vaccines and allow them to better manage costs and resources.

Within this context, PAHO’s Immunization Unit (IM) held a Meeting of an Ad-Hoc Panel of Experts on Rubella and Measles in Washington, D.C., from 3-4 March 2004. The purpose of the meeting was to review the current strategies for rubella and CRS elimination, review current PAHO measles surveillance indicators and definitions for measles elimination, and make suggestions for revisions where needed.

The meeting brought together experts and health officials from Brazil, Canada, Chile, Honduras, Mexico, the United Kingdom, and the United States. PAHO IM staff and consultants, as well as staff from WHO, also attended. The experts reaffirmed that the strategies to eliminate rubella and CRS being advocated by PAHO are correct. These include routine high level coverage of children; mass vaccination campaigns of adults to reduce the pool of susceptibles; inclusion of rubella vaccine in “follow-up” measles campaigns; and high-quality surveillance of rubella and CRS.

The following table lists several of the issues addressed by the experts.

Are the case definitions for CRS useful?

- Case definitions for surveillance of CRS are very useful. It must be remembered that there is a difference between surveillance and diagnosis. A sensitive definition for reporting suspected CRS cases to trigger investigation is important in the context of vaccination. The present definition appears adequate for surveillance: a health care worker at any level of the health care system should suspect CRS in an infant when (1) one or more of the following birth outcomes are detected: congenital cataracts, hepatosplenomegaly, patent ductus arteriosus, purpura, or hearing impairment and (2) an infant’s mother was known to have had laboratory confirmed rubella infection during pregnancy AND after a thorough physical examination, for any reason, there is clinical suspicion of CRS in the infant. For diagnosis, a more specific definition might be appropriate. Laboratory confirmation remains the gold standard.
- For purposes of monitoring trends, surveillance should be strengthened throughout the Americas through collaboration with the regional Perinatal Information System from CLAP (Latin American Center for Perinatology and Human Development) and the ECLAMC (Latin American Collaborative Study of Congenital Malformations).

What should be the guidelines for CRS case investigation and follow up?

- The present system of sentinel CRS surveillance is appropriate for countries in early stages of elimination activities. As the program matures, surveillance should probably extend to secondary hospitals as well as tertiary centers. In the end stages, attempts should be made to identify/investigate every case.

What are the potential benefits of the rubella initiative on strengthening the health system?

- Helps strengthen surveillance and services to newborns (e.g., hearing screening, birth defects surveillance).
- May potentially improve services and follow-up to children with birth defects such as impaired hearing and learning disabilities.
- Provides contact between official health services and families, who often are not in contact with these services.
- Increases awareness of health issues for women.
- Offers an opportunity to link child health and child education services.
- Strengthens infrastructure and quality of services.
- Creates cost savings for the health system.
- Helps establish structure/machinery for introducing future vaccines for use in adults (e.g., MCV, human papillomavirus).

Given the current surveillance systems in the Region, where does PAHO need to move in order to strengthen the surveillance systems that are in place?

- Full integration of measles and rubella surveillance requires definition of a suspected measles/rubella case. Since younger health care workers are not familiar with measles, the following is proposed for a case definition: a fever and rash illness or when a health care worker suspects measles or rubella infection.
- All notified suspected cases should be reported to the health units in their country as well as to standard disease surveillance systems.

What criteria/indicators should be used to evaluate the adequacy of integrated surveillance?

- For purposes of discussion, integration is defined as not having totally separate reporting/surveillance systems for measles and rubella. Except for outbreak settings, all specimens will be tested for measles and rubella.
- Indicators should be developed for adequacy of combined/integrated measles/rubella surveillance.
- Many of the existing measles indicators can be used as is; some may require modification.
- An important indicator of sensitivity of surveillance is the reported rate of suspected cases. It would be useful to have a minimum indicator of sensitivity comparable to the AFP rate used in polio. Participants asked what experiences he reviewed so that proposals for a baseline rate could be discussed at the November 2004 Technical Advisory Group on Vaccine-preventable Diseases (TAG) meeting (e.g., 1-5/100,000 is being used in Mexico and the United Kingdom).
- For purposes of definition, some countries that use the age group to which the baseline rate would be applied also needs to be established.
- An indicator of specificity of surveillance relates to the results of lab testing.

What should be the guidelines for CRS case investigation and follow up?

- The present system of sentinel CRS surveillance is appropriate for countries in early stages of elimination activities. As the program matures, surveillance should probably extend to secondary hospitals as well as tertiary centers. In the end stages, attempts should be made to identify/investigate every case.

What is the current status of rubella and CRS elimination?

- Elimination of rubella and CRS in the Americas is the interruption of endemic rubella virus transmission in all countries. There are no indigenous acquired cases of CRS.
- Re-establishment of endemic transmission is a situation in which a chain of transmission continues unbroken for a period ≥21 months.
- Other definitions and classifications should be comparable to those established for measles.

Other indicators of health status for women of childbearing age?

- Experience in mass vaccination of millions of women of childbearing age has allowed follow-up of several thousand women who were vaccinated without being aware of pregnancy. Follow-up of their pregnancies has yielded very reassuring results. Although <3.6% of infants born to susceptible women vaccinated in early pregnancy were IgG positive, none had anomalies compatible with congenital rubella syndrome. Virus isolation studies are continuing.
- Other countries undertaking mass vaccination of adult women should conduct similar studies.

Figure 2. Proportion of municipalities with measles coverage ≤95% among children aged 1 year. Region of the Americas, 2002

Meeting of Ad-Hoc Panel of Experts on Rubella and Measles

During its September 2003 session, PAHO’s 44th Directing Council endorsed the elimination of rubella and congenital rubella syndrome (CRS) elimination by 2010 and urged countries to draft national plans of action within one year. It also requested the Director of the Organization to elaborate a regional plan of action and mobilize resources in support of the rubella and CRS elimination goal.

These recommendations were based on rapid reduction in diseases burden from the implementation of an accelerated rubella control strategy; the extensive experience gained by the Region in vaccinating large and heterogeneous population groups; the cost-benefit data from the English-speaking Caribbean; the availability of a safe, effective, and efficacious vaccine; and the existing political commitment of Member countries.

Within this context, PAHO’s Immunization Unit (IM) held a Meeting of an Ad-Hoc Panel of Experts on Rubella and Measles in Washington, D.C., from 3-4 March 2004. The purpose of the meeting was to review the current strategies for rubella and CRS elimination, review current PAHO measles surveillance indicators and definitions for measles elimination, and make suggestions for revisions where needed.

The meeting brought together experts and health officials from Brazil, Canada, Chile, Honduras, Mexico, the United Kingdom, and the United States. PAHO IM staff and consultants, as well as staff from WHO, also attended. The experts reaffirmed that the strategies to eliminate rubella and CRS being advocated by PAHO are correct. These include routine high level coverage of children; mass vaccination campaigns of adults to reduce the pool of susceptibles; inclusion of rubella vaccine in "follow-up" measles campaigns; and high-quality surveillance of rubella and CRS.

The following table lists several of the issues addressed by the experts.

- Full integration of measles and rubella surveillance requires definition of a suspected measles/rubella case. Since younger health care workers are not familiar with measles, the following is proposed for a case definition: a fever and rash illness or when a health care worker suspects measles or rubella infection.
- All notified suspected cases should be reported to the health units in their country as well as to standard disease surveillance systems.
- For purposes of discussion, integration is defined as not having totally separate reporting/surveillance systems for measles and rubella. Except for outbreak settings, all specimens will be tested for measles and rubella.
- Indicators should be developed for adequacy of combined/integrated measles/rubella surveillance. Many of the existing measles indicators can be used as is; some may require modification.
- An important indicator of sensitivity of surveillance is the reported rate of suspected cases. It would be useful to have a minimum indicator of sensitivity comparable to the AFP rate used in polio. Participants asked what experiences he reviewed so that proposals for a baseline rate could be discussed at the November 2004 Technical Advisory Group on Vaccine-preventable Diseases (TAG) meeting (e.g., 1-5/100,000 is being used in Mexico and the United Kingdom).
- For purposes of definition, some countries that use the age group to which the baseline rate would be applied also needs to be established.
- An indicator of specificity of surveillance relates to the results of lab testing.

Some members of the expert panel (from left to right): Dr. Carlos Castillo-Solórzano, Dr. Peter Strebel, Dr. Louis Cooper, Dr. Stansky Plotkin, Dr. Michael Katz, Dr. Alan Horman and Dr. Jon Andrews. Washington, D.C., 3 and 4 March 2004.
Rubella Watch

Are there additional tests or collection methods that should be included in the laboratory network system? For elimination purposes, when should a secondary group in which tests or collection methods should routinely be repeated?

What is the appropriate use of immunization tests in pregnancy?

What should be the guidelines for obtaining specimens for rubella virus culture?

What are the most appropriate definitions of measles elimination and re-establishment of endemic indigenous transmission for PAHO?

What criteria in PAHO should be used to assess interruption of indigenous transmission (post-eradication)?

What should be the priority review search issues for rubella and congenital rubella syndrome elimination?

Serum IgM testing within 5 days of rash onset may be negative in persons who are infected with rubella. For surveillance purposes, if IgM does not detect the test, this is adequate in the earlier stages of elimination activities but will not be as elimination is approached.

In later stages of the programme, specimens should be collected when a vaccine specimen (if the initial IgM test taken within 5 days of rash onset) is negative. This will allow testing of paired sera for both IgG and IgM.

Assessing suspected rubella in pregnant women will require maternal and fetal specimens if the initial IgM test taken within five days of rash onset is negative. This will allow testing of paired sera for both IgG and IgM.

Asyrdy testing should be a useful adjunct to IgM testing in assessing how recently infection occurred. However, it may not be possible to rule out re-infection, which may result in an IgM response.

In some areas of some countries, pregnant women are routinely tested for both IgG and IgM antibodies. Unless there is a suspicion of recent exposure to rubella, IgG testing is not recommended because of the low, but possible, false positivity or false detection of persistently positive IgM circulating antibodies.

Samples should be collected for the assay of other pathologies, including, but not limited to, rubella virus testing in assessing how recently infection occurred. However, it may not be possible to rule out re-infection, which may result in an IgM response.

In every country, one or more persons should be identified with the responsibility to assure collection of specimens for rubella virus isolation. This could well be the person responsible for measles virus isolation. As each outbreak is approached, efforts should be made to isolate rubella virus from all sporadic cases and from every chain of transmission, both for diagnostic purposes and characterization of the strain of virus.

Isolates obtained from these efforts should be characterized to enable appropriate use of molecular epidemiology.

Development of, for example, oral fluid (or other pharyngeal sample) RT-PCR technology could obviate the need for virus isolation for purposes of diagnosis.

There are the surveillance indicators proposed by PAHO appropriate?

A range of indicators will be needed, including level of population immunity, epidemiological surveillance and investigation, laboratory capacity and performance.

In addition to criteria relating to duration of interruption of transmission and other factors mentioned above, operational criteria relating to programme performance will be needed (e.g., review of clinic registers).

In addition to criteria relating to duration of interruption of transmission and other factors mentioned above, operational criteria relating to programme performance will be needed (e.g., review of clinic registers).

Impact of rubella program on routine immunization coverage and on strengthening health services.

Epidemiological/economic implications of immunizing adult males in rubella programs.

Document the time and affected spread of rubella and CRS in the Americas and the costs and benefits of intervention.

Document the impact of rubella and rubella elimination on sectors other than health – e.g., education. Evaluate whether ITC-PATTERNC is a cost-effective tool/alternative clinical specimens (e.g., oral fluid, dried blood spots on filter paper) and associated costs.

Review country experience with surveillance indicators/strategies.

Evaluators’ visits to programs in other countries.

Evaluating the hemispheric Vaccination Week.

Review surveillance of events supposedly attributable to vaccines and immunization (EADVX) and injection safety practices in PAHO.

What should be the guidelines for obtaining specimens for rubella virus culture?

What are the most appropriate definitions of measles elimination and re-establishment of endemic indigenous transmission for use in PAHO?

What criteria in PAHO should be used to assess interruption of indigenous transmission (post-eradication)?

What should be the priority review search issues for rubella and congenital rubella syndrome elimination?

Pan American Health Organization

Rubella Watch EPI Newsletter

April 2004, Volume XXVI, Number 2

Towards Elimination of Rubella and Congenital Rubella Syndrome

Among the activities marking the celebration of the Vaccination Week in the Americas, El Salvador and Ecuador are conducting vaccination campaigns among men and women to eliminate rubella and congenital rubella syndrome. In El Salvador, 2,9 million persons aged 15-19 years will be vaccinated, while in Ecuador, 5.1 million persons aged 16-19 years are being targeted. This strategy is designed to rapidly reduce the circulation of the rubella virus, as well as to prevent the shift of disease burden to susceptible young adults, particularly women of childbearing age. Both campaigns will be ongoing until 31 May 2004.

This intervention has a high cost-benefit ratio, generates savings for the health system, and is an opportunity to re-educate in the care of young adults and in maternal health. In addition, this activity promotes a culture of prevention and plays a critical role in reducing mortality and congenital malformations among children. During vaccination campaigns, advocacy, promotion, and social mobilization generate enormous benefits for strengthening health services directed at the adult population. The use of the combined measles-rubella (MR) vaccine further strengthens measles elimination in the Americas.

We salute the political commitment of the national authorities who, through presidential decrees, have declared the vaccination campaigns to be of national interest and have assigned the resources required for such effort. We also recognize health workers for their dedication and perseverance.

Finally, we congratulate international cooperation agencies who have contributed to the success of this campaign with their technical and financial support.

Vaccination of Adults to Sustain the Interruption of Measles Transmission and to Eliminate Rubella and Congenital Rubella Syndrome in Ecuador

Background

Like the other countries of the Hemisphere, Ecuador is a signatory to the resolution of the 44th Directing Council of the Pan American Health Organization/World Health Organization (PAHO/WHO), a resolution which established the goal of eliminating rubella and congenital rubella syndrome (CRS) by the year 2010.

As a first step toward rubella and CRS elimination, Ecuador conducted a successful campaign with the measles and rubella (MR) vaccine targeting the population aged 16-19 years.

In 2004, Ecuador continued its efforts to achieve rubella and CRS elimination by conducting a nationwide mass vaccination campaign with the MR vaccine targeting the population aged 16-19 years.

The objectives of the campaign were as follows:

1. Achieving 95% coverage or more in every municipality during the campaign.
2. Interrupting rubella transmission in order to eliminate rubella and CRS.
3. Reducing the risk of measles outbreaks secondary to the interruption of campaigns, thus consolidating the interruption of indigenous measles transmission.

Methodology

The campaign was conducted between 3 May and 1 June 2004, with the goal of vaccinating 2,469,877 men and 2,347,727 women aged 16-19 years (excluding 315,828 pregnant women).

Vaccination was processed through the PAHO Revolving Fund for Vaccine Procurement. The vaccine lots reached Ecuador between 13 February and 14 October 2004 and were distributed to the provinces one month before campaign start-up.

National committees were created to promote inter-sectoral cooperation in both the public and private sectors, as well as to garner support from political institutions and technical agencies. The teams were asked to provide logistical support. Similar committees involving local authorities and non-governmental organizations were set up in the provinces, cantons, and health areas.

To raise campaign awareness, visits were made to senior executives of workplaces employing people within the campaign’s target group. Partnerships for social mobilization were built with organizations that could collaborate and participate in the campaign. A month before the campaign, the Presidency of the Republic issued a decree urging governmental and non-governmental institutions and the civil society at large to participate in the campaign.

The campaign guidelines of the information and social mobilization strategy enabled provinces and health areas to develop complementary activities. Television and radio spots were broadcast in Spanish, Quechua, and Shuar. The print media was also used, and extensive coverage was provided.

The first phase of the campaign was aimed at vaccinating the captive population, which weeks earlier could not be reached in order to define vaccination targets and to better program vaccination activities. Meanwhile, all health facilities were equipped with vaccination posts. Mobile teams were sent to places where the public congregates. In a second phase, the campaign focused on conducting “mop-up” activities in urban areas, densely populated areas, and urbanized neighborhoods.

The doses administered were tabulated weekly, with a breakdown by location (province and canton), sex, and five age-groups: 16-18, 19-24, 25-29, 30-34, 35-39 years. To facilitate data consolidation at the national level, the doses administered within a province were classified according to the canton of origin of each person vaccinated. When the person vaccinated resided in a distant province, doses were assigned to the province of origin.

Rapid coverage monitoring (RCM) activities were programmed and conducted in conjunction with an active search for unvaccinated persons. Under the campaign’s RCM guidelines, at least 40 individuals within each “hot-spot” were reviewed per RCM. People were encouraged to carry their vaccination card during the campaign to document their vaccination status. Results were divided into three categories: correctly vaccinated, 90%-94% vaccinated, and 29%-95% vaccinated. To evaluate the campaign’s social communication component, a survey protocol was also developed.
“440 million people, children, adolescents, and adults from and women of the countries and territories have been protected against measles and rubella thanks to the measles, rubella, and congenital rubella syndrome elimination initiatives, implemented since 1994. Certainly, the benefits of the vaccination have known no borders.”
In addition, with support from the National Institute of Hygiene, a protocol was designed to ascertain the immunological status of pregnant women who were inadvertently vaccinated. These women and their infants are being followed up.

**Results**

Based on the estimated target population, national coverage reached 103.2%; 105% for men and 105% for women. For pregnancy, 11.5% (25) had coverage of 90%-94%, and 27.2% (50) had <90% coverage. Figure 2. The last two groups are 12 years and 12 months, respectively, of the population resides.

In all, 6,661 RCMS were carried out (range: 23 to 1,924 per province). Of the total population, 15,927 people were surveyed, i.e., an average of 47 people per RCMS (range: 29 to 102). Of the people surveyed, 92.8% (14,816) had been vaccinated, i.e., a range (96.5% to 100%) in the individual health areas. Most (75.8%) of the RCMS showed that >95% of the respondents had been vaccinated, 13.8% showed that 90%-94% of the respondents had been vaccinated, and 10.4% showed that <90% of the respondents had been vaccinated.

Broadcasting of radio and television spots began the second week of the campaign because of delays in the disbursement of funds. A total of 3,474 surveys to assess campaign awareness were conducted in 8 provinces, 88.6% of the urban and 77.2% of the rural areas and 11.4% in rural zones. Among respondents, 96.5% had heard a message about a special vaccination event, 88.2% related it to the campaign, and 6.1% related it to the vaccination week. The media most frequently cited as a source of information were TV (78.1%), radio (47.9%), health unit (44.5%), mobile megaphone (32.3%), newspaper (22.8%), and note from school (18.4%). Among the respondents, 95% of the women and 48% of the men showed that pregnant women should not be vaccinated, and 7.3% correctly answered questions about the target group. Some mass media articles created controversy regarding the safety of the vaccine for pregnant women and the adequate conduct for follow-up of pregnant women inadvertently vaccinated. Clarification statements from independent key persons from the medical community, as well as EPI staff and PAHO collaborators, were needed to manage these incidents.

A total of 1,316 pregnant women inadvertently vaccinated were reported. Among them, 13.6% (179) were susceptible and should be followed until they give birth so that clinical and serological assessment of their newborns can be performed.

**Discussion**

Planning started nine months before the campaign. It was instrumental for timely procurement of supplies, training tools, and informational and psychological counseling in the development of the vaccination campaign. It was also used during the negotiation, especially for brigades mobilization and social communication.

The campaign components to be supervised in priority were assessed weekly in light of preliminary findings and problems encountered. Additional adjustment was emphasized in major cities, mainly, RCMS, which can be used as a tool to quickly assess campaign progress, were unevenly conducted from province to province. This indicates the need to RCM a regular part of supervision and promote its usefulness.

The only province that failed to meet the >95% target coverage borders with Guatemala and achieved 94.2% coverage. Of the 59 cantons with <90% coverage, 48% are in the Sierras, 37% are on the coast; 15% are in Amazon Region. In 76% of these cantons with low coverage, >70% of the population lives in rural areas where access is difficult, which may explain the lower coverage achieved. Additional efforts on lower administrative coverage was reached in cantons in the vicinity of major cities. This may be the result of reporting problems regarding the origin of the vaccinated person.

The confusion over the reason not to vaccinate pregnant women and the safety of the MMR vaccine in pregnant women lies partly in the inadequate dissemination of information to health professionals and parents of continuing education on vaccines.

Several valuable lessons were learned from the immunization campaign. They are listed in the box below.

**Lessons Learned**

The following are lessons learned from the measles–rubella vaccination campaign conducted in Ecuador in 2004:

- Express political will and commitment through an official act, such as the presidential decree directed to the public at large.
- Ensure timely execution of each program component to achieve 95% or greater coverage in adults, especially active and passive components to the procurement of supplies, local programming of vaccination activities, supervision and monitoring, social mobilization, information systems, and communication. Under the component communication, information must be made available to community leaders, journalists, and caregivers.
- Adopt a health promotion approach to ensure interinstitutional and intersectoral partnerships with NGOs and communities are maintained.
- Ensure financing of the social mobilization component and the timely kick-off of the mass campaign: prioritize television, radio, and mobile megaphone messages; create radio spots in the countries main language.

**Conclusions and Recommendations**

TAG acknowledged the remarkable progress achieved by PAHO’s Immunization Unit over the last two years in coordinating technical support to Member States. Activities have included advancing the Directing Council Resolution 12.3 (R1) in September 2003 on rubella and CRS elimination, organizing ad-hoc expert group meetings on rubella and measles, convening regional and global rotavirus meetings, assisting in the development of country and regional Plans of Action, conducting three country evaluations, organizing and supporting the Vaccination Week in the Americas, and advising on numerous country-based surveillance activities.

**Rubella Recommendations**

### 1. Surveillance

- TAG endorses the rubella/CRS definitions based on the deliberations of the Meeting of the Ad-hoc Panel of Experts in Rubella and Measles held in Washington, D.C. in March 2004 cited in PAHO’s EPI Newsletter of April 2004 (Vol.XXXI, 26), available at http://www.paho.org/english/ad/hc/epi/Newslett.html. The definitions clarifies that the determination of this report also apply in full to rubella elimination.
- For elimination purposes, full integration of measles and rubella surveillance is recommended. Individual laboratories are an important aspect of this surveillance system. Emphasis must be on active surveillance.
- Except in an outbreak setting, all specimens must be tested for both measles and rubella virions.
- TAG endorses the indicators currently reported in the rubella bulletin, with the revisions suggested by the March 2004 Ad-Hoc Panel of Experts in Rubella and Measles.
- Three indicators are particularly critical: the proportion of suspected cases with an adequate investigation, the proportion of suspected cases with an adequate blood sample, and the proportion of transmissons resulting in rubella or representative samples for virus isolation.
- A maternal case investigation includes a home visit within 48 hours of notification, completeness of registration, date of collection, date of notification, date of investigation, date of rash onset, date sample taken, type of rash, pre-pregnancy, dates of previous measles/rubella vaccinations, and active case searches.
- Efforts to monitor reported measles/rubella cases, age at disease, location, and vaccination status should continue.
- In the context of CRS elimination, CRS surveillance requires an active component and a specific definition. To guarantee rapid investigation of suspected CRS cases, TAG recommends the following definition of a suspected CRS case: A health care worker at any level of the health care system should suspect CRS in an infant when (1) one or more of the following clinical outcomes are detected: congenital cataracts, congenital heart disease, pertussis-like symptoms; or (2) an infant’s mother was known to have had laboratory-confirmed or suspected rubella infection during pregnancy. For diagnosis, a more specific definition should be appropriate, with laboratory confirmation remaining the gold standard. During elimination, reported suspected CRS cases should have specimens collected for IgM testing and virus isolation.
- TAG recommends that PAHO convene an ad-hoc...
Rubella and CRS articles

meeting of experts to determine lessons learned and define good public health practice for establishing CRS surveillance. Issues to consider include review of existing literature and country experience, as well as reaching out to tap the expertise of professionals in various fields who come into contact with CRS-affected children. This includes, but is not limited to, ophthalmologists, cardiac surgeons, schools for the deaf, otorhinolaryngologists, and pediatric infection disease specialists. This meeting should help refine surveillance approaches and case detection strategies, for instance the use of low-birth weight as an investigation trigger to narrow the scope of perinatal screening.

• TAG encourages the implementation of adult vaccination campaigns in all countries that have successfully conducted adult mass vaccination campaigns.

• The countries that have conducted mass vaccination campaigns only in women will need to determine the extent of the virus transmission and susceptibility in men, and develop appropriate strategies to reduce the number of rubella-susceptible men.

• Substantial evidence has accumulated from many studies, including recent studies in Brazil and Costa Rica, indicating that there is no identifiable link between vaccinating pregnant women and giving birth to a child with CRS. Therefore, there is no reason to modify the current approach of vaccinating all women of childbearing age (WCA) during campaigns. Brazil and Costa Rica should be congratulated on their studies and encouraged to submit their findings for publication.

One day prior to the TAG Meeting, the PAHO Measles/Rubella Laboratory network met to discuss a number of technical and logistical issues. Recommendations emerged relating to IgM kit selection, viral isolation and genotyping, preferred sample types, laboratory accreditation, classification of vaccine-related cases, treatment of false positives, treatment of suspected cases in pregnant women, and laboratory monitoring. These recommendations can be found in Annex 2 of the TAG final report.

In September 2003, PAHO’s 44th Directing Council adopted a resolution to eliminate rubella and CRS by 2010 and urged Member States to prepare national Plans of Action in support of that objective. The elimination of rubella and CRS in the Americas has been defined as the successful interruption of endemic transmission of rubella virus in all countries of the Region without the occurrence of CRS cases associated with endemic transmission.

As of July 2004, approximately 99% of birth cohorts in the Region of the Americas have had access to the combination measles, mumps and rubella vaccine (MMR). Only Haiti has yet to include the rubella antigen in its vaccination schedule. In 2002, all countries of the Region began conducting follow-up campaigns (second immunization campaign for infants aged <5 years) using the measles-rubella vaccine (MRR), achieving >90% coverage age. Between 1998 and July 2004, the English-speaking Caribbean, Costa Rica, Honduras, El Salvador, Mexico and Ecuador conducted adult vaccination campaigns targeting women and men. Campaigns in Brazil and Chile targeted only women of childbearing age. The remaining countries in the Region plan to conduct adult vaccination campaigns between 2005 and 2007.

One of the main challenges in conducting adult vaccination campaigns included monitoring vaccine safety and ensuring safe immunization practices. Also, since persons cannot donate blood for vaccine screening and infectivity tests, which are needed to avoid shortages in blood supply. Since the introduction of the vaccine and launch of vaccination campaigns, rubella incidence has fallen 99.3% from 135,000 reported cases in 1998 to only 921 in 2003.

While only 18 countries/territories in the Americas reported on CRS in 1998, by 2003 the entire Region was conducting CRS surveillance. In 2004, five of the six indicators for integrated rubella/measles surveillance were >80% at the regional level. High-quality surveillance is essential to detect the congenital conditions and provision of counseling and care. Sensitive surveillance will also help to conduct clinical follow-up and case management of affected children.

Coverage reached over 95% in several countries.

Bolivia, Colombia, and Peru have programmed a joined campaign in the Andean Sub-Region for September 2005. Other countries in the Region have also planned to conduct rubella vaccination campaigns in men and women between 2005 and 2006 as shown in Figure 1.

Given the complexity of adult vaccination and the lessons learned during the campaigns recently conducted in countries of the Region, PAHO’s Immunization Unit (IM) is programming two workshops on rubella and CRS surveillance. One will be held in Bogotá, Colombia, from 2-6 May 2005 and the other in Santa Cruz, Bolivia, from 12-16 May 2005.

Following vaccine introduction and implementation of vaccination campaigns, rubella incidence decreased by 99.5%, from 135,000 reported cases in 1998 to 1,550 cases in 2004. Indicators of integrated measles/rubella surveillance are >80%. At this stage of the elimination initiative in the Americas, two new indicators have been proposed to monitor surveillance quality: proportion of transmission chains with representative samples for virus isolation and proportion of cases with adequate investigation.

The number of countries/territories in the Americas reporting on CRS cases increased from 18 (13%) in 1998 to 100% in 2003. However, CRS surveillance is still not complete. Argentina, Brazil, Costa Rica, El Salvador, and Peru have conducted retrospective studies in children in obstetrics hospitals, schools for the deaf and blind, and the community to identify children with probable or confirmed CRS. In other countries, like Peru, research is being conducted in collaboration with the World Health Organization. The goal of these studies is to identify ways to improve CRS surveillance and detect suspected cases at the primary health care level, while involving specialists.

In December this year, IM will convene an ad-hoc meeting of experts from different countries of the Region to determine the lessons learned, define good public health practices for establishing CRS surveillance, and help with refining strategies for surveillance and case detection.

High quality CRS surveillance is essential for the detection of birth defects in infants. It also contributes to the strengthening of integrated perinatal care and promotes consultations for
congenital infections and newborns at risk and a more thorough check-up of young children.

Currently, few specimens are processed for viral isolation and molecular typing, which could help us determine the source of infection and the genotypes. Phylogenetic studies of rubella viruses have shown that clade 2 viruses (formerly called genotypes) and 7 genotypes. In the Americas, the 1C rubella virus has been identified as endemic. Clade 2 viruses have not been found circulating in the Region; thus, if clade 2 viruses were to be isolated, they would be considered imports. In order to improve the viral isolation technique, IM, FIOCRUZ in Brazil, and the US Centers for Disease Control and Prevention (CDC) will hold a workshop on this technique at the FIOCRUZ laboratory in Rio de Janeiro from 4-8 April 2005. Also, to increase timeliness and facilitate laboratory diagnosis, Peru, PAHO/WHO, and CDC are conducting a study for rubella diagnosis using filter paper and oral fluids.

Implementing the rubella eliminations strategy greatly contributes to the reduction of inequalities in maternal health outcomes, strengthens the political commitment for immunization services, and promotes the culture of prevention. In addition to CRS prevention, women’s health care can be further improved by the strengthening of adult health services, staff education improvements in epidemiological surveillance, decentralization of decision-making, boost in program management, enhanced health awareness, and community participation that result from the implementation of the strategy.

Besides being technically sound, PAHO’s rubella elimination strategy is backed by political will, financial sustainability, social acceptance, and feasibility. The support and involvement of the Inter-agency Coordinating Committee within each country will be critical for sustained commitment and galvanizing necessary resources to achieve the goal.

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Main Strategies for Rubella and CRS Elimination in the Americas

In September 2003, the 44th Directing Council of the Pan American Health Organization adopted a resolution to eliminate rubella and CRS by 2010. The elimination of rubella and CRS in the Americas has been defined as the successful interruption of endemic transmission of rubella virus in all countries of the Region without the occurrence of CRS cases associated with endemic transmission.

The main strategies for rubella and CRS elimination in the Americas, based on knowledge acquired about the disease, the vaccine, and rubella control experiences, are as follows:

- Introducing the rubella vaccine in routine immunization schedules and reaching >95% vaccination coverage in the target age group in each municipality;
- Implementing a one-time mass vaccination campaign of men and women in all countries with endemic transmission. This strategy reduces significantly the time to interrupt rubella virus circulation and rapidly prevents the occurrence of CRS;
- Continuing the use of the measles-rubella vaccine in follow-up campaigns for measles elimination;
- Integrating rubella surveillance to the epidemiological surveillance system used for measles elimination, immediately investigating cases, and rapidly implementing response measures;
- Implementing CRS surveillance implementation before rubella vaccine introduction, which will provide basic information to document impact of immunization programs;
- Strengthening laboratory diagnosis of rubella and CRS and virus isolation in all countries of the Region; and
- Disseminating information for action at all levels of the health system.

Figure 1. Planned Immunization Campaigns for Rubella and CRS Elimination, by Country and by Year

Pan American Health Organization
Table 1. Missing Information and Data Entry Errors by Variables in MEISS. The Americas, 2002-2003

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Table 2. Selected Missing Data Over Time, 2000-2003

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<th>Year</th>
<th>Overall missing information</th>
<th>Percentage missing measles vaccination status</th>
<th>Percentage of persons without last measles vaccination date*</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>11.2%</td>
<td>10%</td>
<td>52%</td>
</tr>
<tr>
<td>2001</td>
<td>7.7%</td>
<td>21%</td>
<td>47%</td>
</tr>
<tr>
<td>2002</td>
<td>6.7%</td>
<td>19%</td>
<td>15.6%</td>
</tr>
<tr>
<td>2003</td>
<td>7.1%</td>
<td>19%</td>
<td>15.6%</td>
</tr>
</tbody>
</table>

* Among persons at least 1 year of age
** Among persons at least 1 year of age and with at least 1 dose of vaccine

Table 3. Rubella Surveillance in The Americas, 2000-2003

<table>
<thead>
<tr>
<th>Year</th>
<th>Percentage of missing data of rubella vaccination</th>
<th>Percentage of women ages 15-39 without pregnancy status</th>
<th>Percentage of pregnant women with rubella gestational age</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>78%</td>
<td>35%</td>
<td>16%</td>
</tr>
<tr>
<td>2001</td>
<td>62%</td>
<td>39%</td>
<td>7%</td>
</tr>
<tr>
<td>2002</td>
<td>12.2%</td>
<td>9.5%</td>
<td>0%</td>
</tr>
<tr>
<td>2003</td>
<td>4.1%</td>
<td>17%</td>
<td>0%</td>
</tr>
</tbody>
</table>

April 2005, Volume XXVII, Number 2

Meeting of the Interagency Coordinating Committee for Immunization, Guatemala, March 2005: Pushing the Unfinished Immunization Agenda

From early on, the Interagency Coordinating Committees (ICCs) for immunization have been a cornerstone in the success of immunization programs in the Region of the Americas. ICCs channel efforts by international agencies, gov- ernments, and the civil society to help countries strengthen their immunization programs and control vaccine-preventable diseases. ICCs are charged with the task of presentation, the primary focus of the meeting was to complete the unfinished immunization agenda, the conviction that in spite of the Region’s great strides in the fight against vaccine-preventable diseases (eradication of poliomyelitis, elimination of endemic measles transmission), new challenges loom ahead, and much remains to be accomplished. The partic- ipants also recognized that immunization plays a significant role in reaching the Millennium Development Goals of reducing child mortality and improving maternal health, and is a key tool for the promotion of socioeconomic development.

Dr. Rosas Periago praised Guatemala for its achievements in immunization over the last 25 years. She particularly com- mended the country for the introduction of the pentavalent vaccine into its childhood immunization schedule in 2005. Dr. Rosas Periago summarized future challenges to be: eliminating rubella and congenital rubella syndrome from the Americas; sustaining immuniza- tion programs as they introduce new vaccines; and achieving equity by striving to immunize every child. To achieve these goals, Dr. Rosas Periago emphasized the importance of partnerships for external cooperation, and mobilization

Rubella and CRS articles

Rubella and Congenital Rubella Syndrome Elimination Strategy: Contributing to Primary Health Care Renewal

Background

Following the success of the global smallpox eradication, the World Health Assembly resolved to introduce the Expanded Program on Immunization (EPI) in May 1974. Since the creation of the EPI, immunization coverage rates have steadily increased. New vaccines have been added in response to the availability of appropriate technology and the priorities dictated by the health situation.

The development of the EPI in turn spearheaded several initiatives and achievements in the Americas. These include:

- Poliomyelitis eradication, with 6,653 cases reported in 1970 and no wild polio cases reported since August 1991;
- The elimination of indigenous measles transmission, with approximately 250,000 cases reported in 1990 and the last confirmed indigenous case, due to the D9 genotype, reported in November 2002; and
- The elimination of neonatal tetanus (NTN) as a public health problem (defined as less than 1 case per 1,000 live births), a reachable goal since Haiti is currently the only country in the Region where NTN remains endemic.

National managers should continue to ensure the quality of data entered into the national MESS databases. This evaluation suggests many improvements have been made in data quality, including the number of obvious errors, missing data, and information on vaccination status. Most importantly, pregnancy status indicators for females aged 15-39 years with confirmed rubella infection have greatly improved. Documentation of immunization status, information on the date of last immunization, and pregnancy status of women with rubella should remain high priorities in data collection. Infants born to women with rubella during pregnancy must be closely followed and evaluated for signs of congenital rubella syndrome (sensorineural hearing loss, cataracts, and congenital heart disease).

From left to right, Dr. J. Andrus, Chief, Immunization Unit, PAHO; Dr. J. Molina Leza, Pan American Health Organization, Guatemala; Mr. M. Tulio Sosa, Minister of Health, Guatemala; and Dr. E. Asturias, International Cooperation Advisor, Ministry of Public Health and Social Assistance, Guatemala.

www.paho.org/immunization
Rubella Watch EPI Newsletter

Pan American Health Organization

1983-2009

Today, the Region faces a new challenge: the elimination of rubella and congenital rubella syndrome (CRS) by the year 2010.1

EPI and Primary Health Care

In the last thirty years, notable political, economic, and social changes have contributed to health sector reform. The objectives of health sector reform have been to redirect health care financing, to decentralize decision-making for project planning and implementation, and, more recently, to seek improved quality of care and increased equity in health. At the same time, the main objectives of the health sector have been to sustain, and enhance the program’s achievements. While initiatives for the eradication and elimination of vaccine-preventable diseases have made significant and rapid progress, concerns remain that a regional initiative might interfere with the general development of primary health care in the Americas, health services, and the health sector reform process.

Sustainability has also been a concern, as doubts have been raised that achievements can not be sustained after eradication or elimination to prevent the reintroduction and reestablishment of endemic transmission of a disease. However, the results achieved by national programs have provided the ministries of health and their partners with extraordinary confidence. They have assigned adequate resources to sustain immunization programs and implement new initiatives.

The Declaration of Alma-Ata in 1978, following the International Conference on Primary Health Care, called for Health for All and outlined the components of primary health care (PHC). The Declaration emphasized that it was not necessary to achieve all components simultaneously. Rather, a limited number of priority targets should be set and articulated to serve as access points for other activities.

The results achieved by the EPI over the years through its initiatives for disease eradication and elimination are examples of effective collaboration between governments, non-governmental organizations, donors, the private sector, and the community. Lessons learned from social mobilization have contributed to the strengthening of intersectoral and interagency cooperation, and have led to the involvement of key sectors from the civil society.

Implementation of diverse immunization methods or strategies to reach coverage goals have brought health services closer to the community. The experiences gained from the immunization strategies are inputs for other health interventions and contribute to the development of the fundamental pillars of PHC: expanding health services with coverage to reach individuals in their homes and communities, community participation, and intersectoral cooperation.2

Rubella and CRS in the Americas

Rubella is a self-limiting febrile rash illness with few complications. However, if a woman contracts the infection in the early stages of her pregnancy, the rubella virus has devastating consequences and may cause death, blindness, and congenital heart defects, high-risk of neonatal death, and serious birth defects such as deafness, blindness, and congenital cardiacopathy, highlighting the importance of implementing effective strategies for prevention of this disease.

It has been estimated that, before vaccine introduction into national immunization schedules, more than 20,000 children were born with CRS each year in the Region. Rubella vaccination is 95% effective, and a single dose grants immunity for life. A study performed in the Caribbean determined that the cost of eliminating CRS is 7% of the total cost of health and rehabilitative services children with CRS would require without an elimination program.3 Accordingly, in 2003 PAHO’s Directing Council adopted Resolution CD44/11 setting the goal of rubella and CRS elimination by the year 2010.4

The rubella elimination strategy relies on immunizing susceptible population, through the routine immunization system and mass campaigns, and conducting effective surveillance.5 To date, 74% of countries in the Americas have large a syndrome known as CRS, a major risk for future CRS cases. Consequently, rubella elimination also requires the vaccination of adult populations. The complex vaccine schedules for these populations, several new vaccination approaches must be implemented to reach coverage. Consequently, innovative communication strategies must be designed and implemented. Attention must be paid to special technical situations such as monitoring post-vaccine events to achieve their involvement and support.

Adult rubella vaccination will definitely help with acceleration and can contribute to the promotion of vaccination, such as those for human papillomavirus and HIV control.7 Rubella elimination should also improve maternal and perinatal health.

CIRS surveillance and perinatal information systems contribute to promoting wider detection of birth defects in infants, outside the context of adolescent primary care. To achieve high-quality CIRS surveillance, perinatal services must provide comprehensive care, such as well-baby checkups and/or dedicated consultation areas for newborns with congenital infections or at high risk. In monitoring and following-up infants, there has been increased involvement with rehabilitation and special education services. This is an opportunity to improve the quality of child development services and broaden access to them.

Final Considerations

PAHO’s Regional Immunization Unit is planning an interprogrammatic analysis to document the effect of the rubella elimination strategy on the public health system. These assessments will specifically attempt to demonstrate the effect of rubella elimination on the efficiency of the health system, costs, health outcomes, satisfaction among the users of the services, and equity and access to services.

A major challenge for maternal and perinatal care has been to guarantee universal access, given that services in high-risk communities, where the population is poor, are often insufficient. Since rubella immunization aims to reach 100% of the population, it contributes to the reduction of inequities based on gender, race or ethnicity, social status, and geographical location.

In summary, preliminary experience indicates that the rubella elimination contributes to the basic components of PHC (equity, community participation, prevention, intersectoral participation, adequate technology, sustainability, and quality). It also promotes the strengthening of health services in areas such as the information system, management, development of human resources, and logistics. Ultimately, rubella elimination should contribute to the Millennium Development Goals (MDGs) of reducing child mortality (MDG 4) and improving maternal health (MDG 5).

References


The Elimination of Rubella and Congenital Rubella Syndrome in Nicaragua

Background
In October and November 2005, Nicaragua conducted a national immunization campaign against rubella, targeting all men and women aged 6 to 39 years. The overall goal of the campaign was “Together let’s eliminate rubella once and for all.” The entire population of Nicaragua came together during the campaign to achieve rubella elimination. Their efforts have left a legacy: no child in Nicaragua will be born deaf, blind, or mentally handicapped due to the rubella virus.

The national immunization campaign has proven to be a cost-effective intervention. Estimates indicated that the campaign would help avoid 810 cases of congenital rubella syndrome (CRS) after the campaign. The campaign would also help avoid US$ 48.6 million in medical costs. The campaign’s financial support through savings of US$ 48.6 million in medical costs. The campaign’s financial support through savings of US$ 48.6 million in medical costs.

These figures are very conservative. Therefore, each dollar invested in this campaign would help avoid 810 cases of congenital rubella syndrome and 6 cases of CRS. The campaign’s estimated US$ 48.6 million in medical costs.

The nation’s immunization campaign, as did other technical assistance, represent the strategic and financial support that the national immunization campaign provided. In the rubella campaign, as of the start of the campaign (Figure 1).

Planning and Organization
The vaccination strategy used to eliminate rubella required that 100% coverage rates be achieved in diverse target groups (school-age children, adolescents, and adult males and females) over eight weeks.

Accordingly, Nicaragua developed a detailed plan of action beginning the months before the start of the campaign (Figure 1).

Campaign Implementation
The campaign was an important public health priority, which strengthened political participation and the highest levels.

Campaign objectives included:

- The elimination of rubella at the national, depar-tamental, and local levels.
- The objectives of the training workshops were to form the vaccination teams, develop specific work schedules, and develop microplans in all the country’s 162 municipalities.
- The availability of financial support throughout the campaign, as did other technical and financial cooperation agencies.
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One of the conditions of this first stage of planning was to establish technical and operational guidelines. These represented a strategic and methodological framework for the documents used in the campaign.

Social mobilization efforts were extraordinary. The Government of Japan donated the vaccines and strengthened the national cold chain; the Centers for Disease Control and Prevention of the United States, the Sabin Vaccine Institute, the Canadian International Development Agency, the Pan American Health Organization, the United Nations Children’s Fund (UNICEF) provided for social and financial support throughout the campaign, as did other technical and financial cooperation agencies.

The information system and the work of the “microplan centers” were instrumental in the implementation stage of the campaign. Teams at the centers analyzed the coverage on a daily basis, identified the areas that were falling behind, monitored the data, and carried out safe vaccination practices, and assessed the need to strengthen information messages, selective and adapted priorities for action. The teams reported advances daily to all stakeholders.

After the first month of the campaign, 80% of the target population had been vaccinated. Final mop-up activities brought the coverage rate up to 105% (Figure 2); 105% in 90% of the country’s total population. Figure 2 shows >90% can be explained by the lack of accurate population denominators, and by the vaccination of individuals outside the target population. In all age and gender groups, coverage rates were >95%. RCM results indicated that local coverage was >90%. Further, the "non-vaccinated" population identified during the RCM were then vaccinated.

During campaign implementation, Nicaragua encountered several complications. These included a dengue outbreak, communities stranded due to heavy rains and flooding, strikes among medical staff, and the effects from Hurricane Beta, which battered the Caribbean coast at the end of October. Health authorities and nurses kept moving ahead in spite of these critical situations. Where problems existed, opportunities were sought. Vaccination took place in the camps where people took refuge from the hurricane. In addition to vaccinating against rubella, educational messages for the prevention of dengue and other infections were dispensed. The campaign was seen as an opportunity to raise the coverage rate of primary health care services throughout the country’s most remote areas. Since the combined measles-rubella (MR) vaccine was administered, the intervention also helped with strengthening measles elimination.

Final Evaluation and Coverage Certification
To verify that all of the population (males and females aged 6–39 years) was vaccinated, municipalities not only conducted door-to-door RCM, but also provided vaccination cards in coordination with businesses, schools, and universities and reviewed campaign results to ensure completion with microplaning objectives. This process allowed for the identification of vaccination of the "non-vaccinated" and the completion of official campaign coverage registries.

A team of external evaluators was formed to support local effort and certify campaign coverage at national and local levels. Data collected by each municipality was analyzed, including reviewing the completion of microplans and production goals, monthly coverage data by health centers and gender, RCM results, and decisions taken based on the findings. On the basis of this analysis and joint discussions with local teams, the external evaluators conducted additional RCM in selected communities, as a prior step to final certification.

Lessons Learned
The rubella vaccination campaign in Nicaragua generated many lessons, most importantly the systematic monitoring of the campaign, politcal commitment at the planning stage. Other key lessons are described in the box below.

Nicaragua has demonstrated that, even when facing difficult socio-ecological circumstances, it is possible to identify opportunities and reach the disease elimination goal while mitigating other health crisis. The motivation, positive attitude, and commitment characterize the staff from the Ministry of Health; the active participation of a network of volunteers and brigade members; and the local community’s response of the population were the cornerstones of the campaign’s success.

Key Components for Success
- Political commitment and effective advocacy;
- Extensive communication and social participation;
- Thorough organization, training and planning;
- Adequate use of information for decision making;
- Partnerships at all levels with multisectorial actors;
- Effective and adequate monitoring of vaccination safety; identification of opportunities;
- Implementing integrated health activities; and
- Seeking opportunities when faced with difficult situations.

References
**Rubella Watch**

**EPI Newsletter**

**December 2005,**

**Volume XXVII, Number 6**

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**XIV Meeting of the Andean Region and XVII Meeting of the Southern Cone on Vaccine-Preventable Diseases**

Dr. Nicanor Duarte Frutos, President of Paraguay, receiving the certificate of appreciation to recognize Paraguay’s achievements during the rubella campaign the country conducted in April and May 2005. In his address, President Duarte thanked each member of the team that made the campaign a success. He indicated that giving health a priority in Paraguay, as it represents a means to achieving social developments, prosperity, and peace. He stressed that increasing the health budget is necessary, but that better spending and innovation are also critical. President Duarte added that health workers had written a new chapter in Paraguay’s history and hoped with improving the life of its people. Dr. Maria Teresa León Mendino, Minister of Health of Paraguay, presented the results and lessons learned from the vaccination campaign for the elimination of rubella and congenital rubella syndrome (CRS) conducted in Paraguay in 2005.

**Rubella and CRS**

Following the resolution to eliminate rubella and CRS by the year 2010, adopted by PAHO’s 44th Directing Council in 2003, the countries of the Andean Region and Southern Cone have shown notable advances in implementing technical strategies and effective policies for elimination of endemic rubella transmission. Chile (1999) and Brazil (2001–2002) have conducted vaccination campaigns targeting only women. Ecuador (2004) and Paraguay (2005) have conducted mass vaccination campaigns targeting adolescents and adults (men and women), reaching coverage levels over 95%. Venezuela conducted the first phase of its campaign, vaccinating children aged under 16 years in June 2005. At the time of the meeting, Colombia was in the midst of a campaign targeting men and women aged 14–19 years. All ten countries are reporting rubella cases to PAHO weekly. Seven of them also report CRS weekly; however, CRS surveillance is still incomplete.

**Recommendations:**

- The complexity of adult vaccination and the lessons learned from the campaigns recently conducted in the Region have shown that very good planning, communication, and client participation for the search for resources, is required. Also, the surveillance data presented showed the need to include men in the vaccination campaigns.
- Countries should continue their efforts to mobilize and allocate sufficient resources,
- Breaks, samples of 5–10 cases collected at the beginning of the outbreak, followed by subsequent samples collected at periodic intervals every 2 to 3 months, and towards the end of the outbreak, will be required.
- For special situations, such as pregnant women, cases thought to be vaccine-irrelevant, and “false positives” or “cross-reactions,” a detailed epidemiological analysis should be done in a case-by-case basis. Complementing methods of laboratory confirmation, such as viral detection, surveillance should always be considered. Special cases should be classified by a national panel of experts who are part of the National Committee for Immunization Practices.
- CRS surveillance activities should be strengthened by:
  - Monitoring and adjusting the number of pregnant women exposed to rubella during pregnancy;
  - Identifying the signs that should trigger an alert for CRS suspicion at the first level of care (periodic checkup of healthy children);
  - Using the computerized surveillance system for weekly report; and
  - Collecting samples for light testing and viral detection from all CRS suspected cases.

**Classification of Suspect Measles/Rubella Cases as “Vaccine-related” in accordance with PAHO Recommendations**

In a setting of low or absent transmission of the measles/rubella virus, surveillance will detect patients with eruptive febrile illnesses who have positive serological results for measles or rubella but no wild-type measles/rubella virus infection. One explanation for such occurrence is a reaction to the measles/mumps-rubella vaccine (MMR). In 2000, the PAHO Technical Advisory Group on Vaccine-preventable Diseases defined five criteria for concluding that a rash illness is related to a measles/rubella-containing vaccine.

- A case can be classified as having a vaccine-related rash if it satisfies ALL of the following criteria:
  1. Presence of rash illness, with or without fever, but no cough or other respiratory symptoms related to the vaccine.
  2. Rash onset began 7–14 days after vaccination with a measles-containing vaccine.
  3. Serum sample, taken between 8 and 56 days after vaccination, is positive for measles.
  4. Thorough field investigation did not identify the index case or any secondary cases; and
  5. Field and laboratory investigation failed to identify other causes (including failure to identify wild measles virus in culture).

As part of periodic data quality reviews of the Measles Elimination Surveillance System (MESS), the compliance of cases classified as vaccine-related has been checked against the criterion defining the acceptable time period between vaccination and rash onset. The MESS database included a total of 38,894 suspect measles/rubella cases with rash onset between 2003–2005 (as of epidemiological week 9, 2006). Of those cases, 259 (0.67%) were classified as vaccine-related. Figure 1 shows the distribution of cases classified as vaccine-related by the number of days between vaccination and rash onset. For the years 2003–2005, only 34% of the cases classified as “vaccine-related” met the criterion of rash onset 7–14 days following MMR vaccination. To prove whether evidence existed supporting the onset of MMR-related rash beyond the 7–14 day period following vaccination, a literature review and discussions with experts were conducted. This process showed overwhelming evidence of MMR-related rash occurring specifically between 7 and 14 days following vaccination.

**References**


Available at: http://www.wpro.who.int/bull/volumes/82/2/1/852.pdf


Available at: http://www.pediatrics.org/cgi/content/full/106/4/e2305.pdf


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**Pan American Health Organization**

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ince the PAHO Directing Council adopted the initiative to eliminate rubella and congenital rubella syndrome in the Americas by the year 2010, much progress has been achieved. In fact, given the accumulating national experiences, it is believed that the target will be reached well in advance of 2010.

As a special supplement to the Immunization Newsletter, Rubella Watch is a useful tool to share more of the success stories that countries are achieving. Rubella Watch is an electronic newsletter distributed every other month (during the months the Immunization Newsletter is not published).

Rubella Watch will provide updates on rubella activities in the countries of the Americas. If you would like to receive Rubella Watch, please send a request to tch-imm@paho.org, providing your name and e-mail address.

June 2006, Volume XXVIII, Number 3
PAHO and Sabin Vaccine Institute: Second Year of Partnership

On 14 April 2006, Dr. Ciro de Quadros, President and CEO, and Dr. Mirta Roses Pertegaz, Director, PAHO, signed an agreement for a second year of partnership to support PAHO’s regional efforts in the fight against rubella and congenital rubella syndrome (CRS). “The renewal agreement signed today reinforces PAHO’s commitment to contributing to rubella elimination and the importance of the Institute’s association with the public health programs of PAHO,” said Dr. de Quadros.

Rubella virus circulation in the Americas has been documented through epidemiological surveillance, while rubella outbreak investigations have identified CRS cases. It has been estimated that before vaccine introduction into national immunization schedules, more than 20,000 children were born with CRS in the Region each year.

With support from partners such as SVI, PAHO’S Immunization Unit hosted two workshops on rubella and CRS elimination in the Americas. A third workshop will be conducted in Bogotá, Colombia, from 2-6 May 2005 and the other in Santa Cruz, Bolivia, from 12-16 May 2005. Later this year, the Immunization Unit will convene an ad-hoc meeting of experts from the Region to determine lessons learned, define good public health practices for establishing CRS surveillance, and help with refining strategies for surveillance and case detection.

The new project (March 2006-March 2007) will bolster the adult vaccination campaigns needed to complete supplemental immunization activities in the Andean Sub-region and Central America as well as implement such activities in the Southern Cone Sub-region. The project will serve as a pilot program for rubella and CRS elimination that might be adapted and applied in other Regions of the world.

June 2006, Volume XXVIII, Number 3
Rubella and Congenital Rubella Syndrome Elimination: Fast Becoming a Reality

Rubella elimination in the Americas has been defined as the interruption of endemic rubella virus transmission in all countries and the lack of indigenous acquired cases of congenital rubella syndrome (CRS). This goal is achievable since humans are the only host of the rubella virus, and a very effective vaccine (>95% efficacy) conferring lifelong immunity is available.

While many countries have conducted rubella mass vaccination campaigns, only Brazil continues to have rubella transmission in other regions of the world. Among countries that have conducted rubella transmission in other regions of the world, the high population density and migratory movements that characterize many cities in the Americas, combined with the real possibility of rubella virus importations resulting from international travel mean that coverage levels >95% need to be achieved to sustain secondary to importations.

To reach the goal of rubella and CRS elimination by 2010 in the Americas, rapid interruption of rubella transmission is necessary. Using the slogan, “Once and for all,” countries have been implementing mass vaccination campaigns targeting men and women. However, if coverage rates close to 100% are not reached, pockets of susceptibles will remain. These pockets of susceptibles coupled with continued rubella transmission in other regions of the world will pose the constant threat of rubella cases occurring secondary to importations.

The following table summarizes the final conclusions and recommendations of the meeting.

Table 1. Rubella Elimination in the Americas: Last Countries to Conduct Vaccination Campaigns

<table>
<thead>
<tr>
<th>Country</th>
<th>Target Population</th>
<th>Age Group</th>
<th>Scheduled</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guatemala</td>
<td>7.8 million</td>
<td>8–19 years</td>
<td>September 2006</td>
<td>An alliance of partners was mobilized to ensure that all vaccines were purchased.</td>
</tr>
<tr>
<td></td>
<td>women and men</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dominican Republic</td>
<td>5 million</td>
<td>7–15 years</td>
<td>October 2006</td>
<td>An international evaluation program was conducted prior to the vaccination campaign.</td>
</tr>
<tr>
<td></td>
<td>women and men</td>
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<td></td>
</tr>
<tr>
<td>Peru</td>
<td>19.8 million</td>
<td>2–15 years</td>
<td>October 2006</td>
<td>Activities are planned and organized to ensure that the campaign is conducted as scheduled.</td>
</tr>
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<td></td>
<td>women and men</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Argentina</td>
<td>7.4 million</td>
<td>15–19 years</td>
<td>October 2006</td>
<td>Target population will be 100% of both male and female population.</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Mexico</td>
<td>20.3 million</td>
<td>17–29 years</td>
<td>February 2007</td>
<td>During the first quarter of 2006, the District Federal and the state of Mexico have completed MMR vaccination in the 13–19-year age group to control a measles outbreak stemming from an imported case. The remaining 34 states are expected to follow in 2007.</td>
</tr>
<tr>
<td></td>
<td>women and men</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Venezuela</td>
<td>9.6 million</td>
<td>18–19 years</td>
<td>April-May 2007</td>
<td>Response measures to the measles outbreak during the first 2006 quarter have generated lessons on vaccination strategies in crisis situations and contributed to rubella elimination.</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Haiti</td>
<td>1.7 million</td>
<td>1–15 years*</td>
<td>April-May 2007</td>
<td>During the campaign, the MMR vaccine will be introduced in the regular program for children aged 1 year.</td>
</tr>
</tbody>
</table>

August 2006, Volume XXVIII, Number 4
Ad-hoc Meeting of Experts to Establish Best Practices in CRS Surveillance

During the XVI Meeting of the Technical Advisory Council (TAG) on Vaccine-preventable Diseases in November 2004, recommendations were made to enhance the progress already achieved in the Region toward the goal of rubella and congenital rubella syndrome elimination. One principal recommendation was the creation of a supplemental to the Newsletters to share more of the success stories that countries are achieving.

The rubella and CRS elimination strategies implemented in the Americas have resulted in substantial progress to date. As countries of the Region progress toward elimination, new challenges for the detection of suspected CRS cases have become evident. Quality of rubella and CRS surveillance remains a key challenge.

The rubella and CRS elimination strategies implemented in the Americas have resulted in substantial progress to date. At the meeting, new challenges for the detection of suspected CRS cases have become evident. Quality of rubella and CRS surveillance remains a key challenge.

The goal of the meeting was to develop best practices for the surveillance of suspected CRS cases in the Region. Meeting participants shared experiences and lessons learned in order to generate recommendations for enhanced detection and improved surveillance of suspect CRS cases. They upgraded the existing guidelines and tools to be disseminated to public health workers, and also identified opportunities to increase awareness among physicians and other health workers regarding CRS detection.

The following table summarizes the conclusions and recommendations of the meeting.

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<tr>
<td></td>
<td>women and men</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Argentina</td>
<td>7.4 million</td>
<td>15–19 years</td>
<td>October 2006</td>
<td>Target population will be 100% of both male and female population.</td>
</tr>
<tr>
<td></td>
<td>women and men</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mexico</td>
<td>20.3 million</td>
<td>17–29 years</td>
<td>February 2007</td>
<td>During the first quarter of 2006, the District Federal and the state of Mexico have completed MMR vaccination in the 13–19-year age group to control a measles outbreak stemming from an imported case. The remaining 34 states are expected to follow in 2007.</td>
</tr>
<tr>
<td></td>
<td>women and men</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Venezuela</td>
<td>9.6 million</td>
<td>18–19 years</td>
<td>April-May 2007</td>
<td>Response measures to the measles outbreak during the first 2006 quarter have generated lessons on vaccination strategies in crisis situations and contributed to rubella elimination.</td>
</tr>
<tr>
<td></td>
<td>women and men</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Haiti</td>
<td>1.7 million</td>
<td>1–15 years*</td>
<td>April-May 2007</td>
<td>During the campaign, the MMR vaccine will be introduced in the regular program for children aged 1 year.</td>
</tr>
</tbody>
</table>

The high population density and migratory movements that characterize many cities in the Americas, combined with the real possibility of rubella virus importations resulting from international travel mean that coverage levels >95% need to be achieved to sustain secondary to importations.

To reach the goal of rubella and CRS elimination by 2010 in the Americas, rapid interruption of rubella transmission is necessary. Using the slogan, “Once and for all,” countries have been implementing mass vaccination campaigns targeting men and women. However, if coverage rates close to 100% are not reached, pockets of susceptibles will remain. These pockets of susceptibles coupled with continued rubella transmission in other regions of the world will pose the constant threat of rubella cases occurring secondary to importations.

Among countries that have conducted rubella mass vaccination campaigns, only Brazil continues to have rubella transmission in other regions of the world. Both countries did not include the male population in their campaigns.

Even though the cost-benefit of a rubella campaign has been estimated at approximately: 1:13, campaigns require significant attention to implementation and effective implementation. Countries are using innovative tactics to vaccinate all adults and develop new best practices. With so much at stake, it is critical to reach 100% coverage in all municipalities, and among all age groups in both men and women. Coverage levels below this goal will likely result in the continued occurrence of cases, resulting in less commitment, a sense of failure, and distrust in the strategies recommended for rubella elimination.

It should also be highlighted that, in the context of disease elimination, the large resources needed to conduct rubella campaigns to identify and respond to an outbreak compete with the needs of other health interventions, including other immunization activities.
Rubella Watch

EPI Newsletter

1983-2009

T he XVII Meeting of the Technical Advi sers of TAG on Vaccine-preventable Diseases of the Pan American Health Organization (PAHO) was held from 25-27 July 2006 in Guatemala City, Guatemala. TAG meets every two years and functions as the principal forum for providing advice to PAHO Member States on vaccine policies and disease control efforts. The following is a summary of TAG’s conclusions and recommendations as presented in the final report on rubella and CRS surveillance.

The main goals of CRS surveillance should include:
- Monitoring trends;
- Assessing the impact of vaccination programs;
- Identifying reservoirs of transmission;
- Helping to develop or modify programs;
- Verifying the interruption of endemic transmission of rubella virus in the Americas, including identification of imported cases; and
- Serving as a critical advocacy tool.

Advances have been made in the development of laboratory capacity to detect and isolate rubella viruses, increasing our knowledge of the endemic genotypes in the Region. The most frequent genotype is 1C, followed by 1E, and 1G. The last two genotypes were linked to imported cases in epidemiologic investigations. However, the number of specimens for rubella virus isolation is still limited (in 2005, only 93 specimens were collected for isolation) and should be substantially increased to better document endemic virus reservoirs and imported virus genotypes.

TAG was concerned that insufficient laboratory results are being reported within 4 days of receipt of the sample at the laboratory. In some countries, the timelines of this indicator is being affected by the number of subnational laboratories that do not receive enough samples to process them immediately. These laboratories wait to accumulate samples before sending them in order to avoid wasting their kits. In other countries, the indicator is being affected by the delay by the laboratory in the entry of the laboratory result into the national database.

Recommendations:
1. Vaccination Strategies
   - In accordance with previous TAG recommendations, all endemic countries are encouraged to implement a one-time mass vaccination campaign targeting both men and women and achieving >95% coverage.
   - TAG recommends that the criteria for high quality campaigns be included in the design and implementation of rubella mass vaccination campaigns. Those countries that did not vaccinate all susceptibles in the population should analyze their data.
   - In particular to identify the susceptible male population (in which sustained transmission can occur) that should be vaccinated. PAHO should provide support in this process.
   - TAG encourages countries to document the experiences, successes, and lessons learned from their adult mass campaigns in order to share them with other countries.
   - These lessons will be useful for the introduction of HPV vaccine and eventually a vaccine against HIV/AIDS.

2. Surveillance
   - Full integration of measles and rubella surveillance is required as these diseases are important aspects of this surveillance system. Emphasis must be placed on rubella surveillance. Except in outbreak settings, all specimens must be tested for rubella and measles.
   - Countries should ensure that the seven indicators meet the recommended standards.
   - Special attention should be given to checking clusters of suspect cases as well as “silent areas.”

3. Laboratory
   - The number of clinical specimens collected for viral isolation should be increased in order to document the endemic genotypes of rubella and the interruption of endemic transmission of rubella in the Americas.
   - In a pregnant woman, IgM should be obtained only when there is a history of rash or contact with a rubella-like rash. IgM is NOT recommended for routine antenatal testing.
   - TAG recommends that PAHO review the laboratory network, with special attention to the subnational networks, to identify possible bottlenecks and propose corrective actions.

Data presented as of Epidemiological Week 28, 2006.

How to Achieve Rubella Elimination:

In their efforts to achieve elimination, countries should conduct a one-time mass campaign, vaccinating both men and women with MMR or MMRV vaccine. To ensure the implementation of the highest quality campaigns, the following criteria should be met:

- The age group to be vaccinated should be determined based on the epidemiology of rubella in the country, an assessment of the susceptible population, the year of vaccine introduction, subsequent rubella vaccination campaigns, and the need to protect women of childbearing age (WCBA).
- Quality campaigns require vaccinating both females and males, including susceptible adults, and reaching coverage levels close to 100% of the targeted population.
- The highest possible commitment and participation should be ensured.
- Full population participation requires intensive social mobilization and local micro-planning.
- Information system should be practical and useful.
- Capacity to detect and rapidly respond to safety concerns and other emerging issues during campaigns.

 TAG recommends that PAHO review the laboratory network, with special attention to the subnational networks, to identify possible bottlenecks and propose corrective actions.

1 Safety and supply/cost concerns should be considered when using rubella IgM.

Pan American Health Organization

August 2006, Volume XXVII, Number 4

XVII TAG Meeting—Protecting the Health of the Americas: Moving from Child to Family Immunization

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- Serving as a critical advocacy tool.

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- Full population participation requires intensive social mobilization and local micro-planning.
- Information system should be practical and useful.
- Capacity to detect and rapidly respond to safety concerns and other emerging issues during campaigns.

1 Safety and supply/cost concerns should be considered when using rubella IgM.

Pan American Health Organization
Measles and Rubella Laboratory Network in the Region of the Americas

The Measles/Rubella Laboratory Network continues to be fully functional in support of measles and rubella surveillance in the Region of the Americas. The network was established in 1995 and has been providing crucial information to confirm or discard suspect cases, identify circulating virus strains, and evaluate the impact of mass campaigns activities. Laboratory analyses include IgM and IgG antibody detection, virus isolation, detection of viral nucleic acid, and molecular characterization. The Measles/ Rubella Laboratory Network is composed of 21 national laboratories, 124 sub-national laboratories, 2 regional reference centers, and 1 global specialized laboratory (Figure 1). The main activity of national and sub-national laboratories is to test specimens from suspect cases/rubella cases by IgM ELISA. Some national laboratories are also responsible for virus isolation and quality control of sub-national laboratories. To improve virologic surveillance, nine national laboratories are trained in virus isolation and detection in 2005. This was done by conducting supervised visitations and holding a regional training workshop. For 2007, the goal is to increase the number of laboratories performing virus isolation/detection in the Region from 11 laboratories to 18. The regional reference laboratories are responsible for the validation of IgM tests results of the national laboratories. Regional reference laboratories also assist in ruling out measles/rubella cases with possible false-negative or indeterminate results by using additional tests for other febrile rash illness, virus isolation and genotyping. In addition to the previous comments, the regional laboratories, the global specialized laboratory distributes the proficiency panels to the national laboratories and validates new methods for network capacity-building through training and courses. The global reference laboratory is also responsible for the bank of measles/rubella virus strains isolated in the Region.

False Positive Results

Currently, the main challenge for the Measles/Rubella Laboratory Network is dealing with sporadic cases of “false positive results”, particularly for suspect cases with no travel or vaccine history. As the disease becomes less common due to high vaccine coverage and active surveillance for rash illness and fever, the positive predictive value of laboratory test will diminish, resulting in an increased number of false positive results. Parvovirus B19, human herpes viruses 6 and 7, and cytomegalovirus may be clinically misdiagnosed as measles and rubella and their antibodies can cross-react with measles/rubella IgM tests, giving false-positive results.

Rubella Elimination in the Americas: Last Campaigns to Conduct Vaccination Campaigns

The Region has demonstrated remarkable progress in the implementation of effective interruption of endemic rubella transmission through the vaccination of adolescent and adult populations. In 2007, six countries will finalize high-quality mass rubella elimination campaigns: Cuba, Bolivia (2nd stage), Guatemala, Haiti, Mexico (2nd stage), and Venezuela (2nd stage). In addition, El Salvador and Uruguay will conduct follow-up campaigns to decrease susceptible populations to measles and rubella in their respective countries (see Table 1). High quality campaigns are a critical. Important factors to consider includes:

1. The age group to be vaccinated should be determined based on the epidemiology of rubella in the country, an assessment of the susceptible population, the year of vaccine introduction, subsequent rubella vaccination campaigns, and the need to protect women of childbearing age.
2. Social communication should be emphasized during campaign planning.
3. Quality campaigns require vaccinating both female and male populations, including susceptible adults, and reaching coverage levels close to 100% of the targeted population.
4. The highest political commitment and participation should be ensured.
5. Full participation of the population, scientific societies, social sectors, and media requires intensive social mobilization efforts and local micro-planning activities.
6. Information systems should be practical and useful.
7. The capacity should exist to detect and rapidly respond to safety concerns and other emerging campaigns.

Since it is likely that residents of the Americas and other Regions traveling to Rio de Janeiro will be exposed to the rubella virus, the Pan American Health Organization recommends that:

1. Any resident of the Americas, including teams participating in the XV Pan American Games and other tourists, traveling to Rio de Janeiro be immune to rubella including before departure; and

<table>
<thead>
<tr>
<th>Country</th>
<th>Target Population</th>
<th>Age Group</th>
<th>Date of Implementation</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cuba</td>
<td>2.1 million men and women</td>
<td>12-24 years</td>
<td>May 2007</td>
<td>Vaccination is based on surveillance study and response to a meningitis outbreak.</td>
</tr>
<tr>
<td>Haiti</td>
<td>4.7 million men and women</td>
<td>1-15 years</td>
<td>October 2007</td>
<td>The MMR vaccine will be introduced in the regular program for children aged 1 year.</td>
</tr>
<tr>
<td>Bolivia</td>
<td>1.5 million children</td>
<td>1-15 years</td>
<td>September 2007</td>
<td>A follow-up campaign is included to strengthen rubella and measles elimination efforts.</td>
</tr>
<tr>
<td>Venezuela</td>
<td>5.6 million men and women</td>
<td>18-39 years</td>
<td>October 2007</td>
<td>The second stage will finalize rubella and measles elimination.</td>
</tr>
<tr>
<td>Mexico</td>
<td>20.3 million men and women</td>
<td>1-15 years</td>
<td>November 2007</td>
<td>Rubella vaccination will be implemented throughout the remaining 13 states.</td>
</tr>
<tr>
<td>El Salvador</td>
<td>900,000 children</td>
<td>1-4 years</td>
<td>June 2007</td>
<td>A follow-up campaign is included to strengthen rubella and measles elimination.</td>
</tr>
<tr>
<td>Uruguay</td>
<td>200,000 children</td>
<td>1-4 years and susceptible population</td>
<td>October 2007</td>
<td>A follow-up campaign is included to strengthen rubella and measles elimination.</td>
</tr>
</tbody>
</table>

* Uses MMR vaccine.
* ** To be confirmed.
* Note: Argentinas, Brazil, and Chile are determining susceptible adolescent and adult cohorts to complete their campaign for the elimination of rubella and congenital rubella syndrome in the strengthening of measles elimination.
Rubella Watch

EPI Newsletter

2. Health care workers in the public and private sectors be alerted to the possibility of rubella occurrence.

Travelers can be considered immune to rubella if:
- They have written proof of receipt of a rubella-containing vaccine. However, countries can establish an upper age limit beyond which the vaccination requirement does not apply. This age limit should be based on the year of rubella vaccine introduction, rubella vaccine coverage thereafter, and occurrence of rubella epidemics; or
- They have evidence of rubella immunity (rubella-specific IgG antibodies).

Travelers aged >6 months who cannot provide the above documents should be advised to receive rubella-containing vaccines, preferably measles-mumps-rubella (MMR) or measles-rubella (MR), ideally at least two weeks before departure. Exceptions include travelers with medical contraindications to rubella-containing vaccines. Infants aged <6 months should not be vaccinated. Infants who receive MMR before their first birthday must be re-vaccinated according to the country's schedule.

It is essential to include the private health care sector and facilitate the availability of health care to tourists in the surveillance system, since people who can afford international travel are more likely to seek care in private health facilities.

In addition to the measures mentioned above, PAHO encourages the practice of requiring proof of rubella (and measles) immunity for health care to tourists in the surveillance system, since people who can afford international travel are more likely to seek care in private health care facilities.

Elimination Strategies

PAHO's rubella and CRS elimination strategy includes the introduction of rubella-containing vaccine into the routine childhood immunization schedule, the completion of periodic follow-up campaigns with measles-rubella (MR) vaccine, the integration of measles and rubella surveillance, the implementation and strengthening of CRS surveillance, and the implementation of a one-time mass campaign in both men and women to rapidly reduce susceptible populations. The critical elements of a high-quality mass vaccination campaign include high political commitment and participation; strong social communication; intensive social mobilization and local micro-planning to ensure full community participation; the involvement of scientific societies and other social actors; and the inclusion of the media.

Cost of the Strategy

Rubella disease burden data generated through improved rubella elimination activities resulted in the accelerated control of rubella and CRS in the Americas in 1998-2001. Numerous countries achieved the Rubella Elimination goal by 2010, and the world is on the cusp of achieving the 2010 Global Target of eliminating rubella and CRS by 2012. Inclusion of rubella vaccination in the Expanded Program on Immunization (EPI) is critical to achieving this goal.

EPI Newsletter

Volume XXIX, Number 3

Resource Mobilization and Partnerships for Achieving the Regional Goal of Rubella and CRS Elimination

The EPI Newsletter is a publication of the Pan American Health Organization (PAHO) and the World Health Organization (WHO). It provides information and updates on global and regional health issues, particularly related to vaccination campaigns and other public health initiatives. The newsletter is published quarterly and distributed to a wide audience, including health professionals, policymakers, and the general public. It covers a range of topics, including the implementation of vaccination strategies, partnerships for disease control, and resource mobilization efforts. The newsletter aims to inform and engage its readers on the latest developments in public health, emphasizing the importance of collaboration and resource allocation in achieving health goals.
in women aged 5-49 years and men aged 5-39 years; and

• Issuing and completing the vaccination schedule with all antigens in children aged 5 years and other groups targeted by the program.

The population to vaccinate was defined using projections from the 1988 national population and housing census and the analysis of female cohorts aged 2-49 years who had been vaccinated with MR during the years 1999-2001. The following targets were established: 1,101,933 women aged 5-39 years (total=3,217,900), representing 53% of the country's total population.

Campaign Implementation
Community participation was the main focus of the campaign. Public sector institutions, international cooperation agencies, private sector companies, and civil society united their efforts to reach a common goal.

The main strategies for campaign implementation were as follows:

• Announcing that the campaign was a national priority, through the release of a presidential accord encouraging strategic alliances at national, departmental, municipal, and local levels to assist throughout the process.

• Establishing strategic alliances with stakeholders from the public and private sectors, to ensure their active participation and full commitment in the planning, implementation, and evaluation stages of the campaign.

• Identifying the target population concentrated in work and school settings to establish vaccination tactics, needs for logistics, syringes, and other supplies.

• Promoting the campaign as part of the social mobilization strategy.

• Introducing training, monitoring, supervision, and evaluation as components of process management, from planning to implementation.

The campaign started in June 2002. To optimize resources, the launch was held during the first week of the National Immunization Days (NIDs), organized annually to strengthen public and private sectors. The dates of the campaign are as follows:

- Phase I (one week): vaccinate with one dose of oral polio vaccine children aged <5 years, and with MR vaccine the population, pregnant female, accompanying children aged <5 years.
- Phase II (two weeks): vaccinate with one MR dose women (5-49 years) and men (5-39 years) concentrated in preschools, elementary and high-schools, and universities in the private and public sectors. In addition to students, teaching and administrative staff received vaccines at fixed and mobile vaccination posts.
- Phase III (two weeks): vaccinate women (5-49 years) and men (5-39 years) in workplaces, through fixed vaccination posts.
- Phase IV (one week): conduct searches on health units, communities, the workplace, and education centers to identify and vaccinate non-vaccinated individuals. At the same time, rapid coverage monitoring (RCM) activities were conducted in at-risk communities.

Campaign Results
The campaign did not progress as planned due to a national emergency related to an outbreak of hemorrhagic dengue. Vaccination activities were interrupted in the country's two main health regions, accounting for over 60% of the target population. The impact was also felt in the remaining seven health regions, where the pace of vaccination activities slowed down. Six weeks into the campaign, the coverage rate was only 82% (2,635,502 vaccinated). Therefore, national authorities decided to continue with the campaign once the dengue epidemic was controlled. The campaign was launched again in late November and extended until December 2002, reaching a national coverage of 93% (2,992,647 vaccinated).

All health regions of Honduras obtained coverage >95%, by age group and gender, except health region number 4 (Choluteca and Valle Department) where coverage for men was <95%. Among the country's 218 municipalities, 78 (2,211) reached administrative MR coverage >95% in men aged 5-39 years. In women aged 5-49 years, 89% of municipalities reached coverage >95%.

In hospitals, MR vaccination was introduced postpartum and 80,000 women were vaccinated.

No severe adverse event was reported at national level. Only two cases of pregnant women inadvertently vaccinated during the campaign were reported. Both were handled newly-born.

The total cost of the 2002 NIDs and the national measles and rubella vaccination campaign was US$ 2,638,750. Eighty-nine percent of the total (US$ 2,154,997) came from the government of Honduras, in the form of funds assigned to the EPI by the Ministry of Health, from municipalities, and from the private sector. The remaining US$ 281,753 were donated by the United States Agency for International Development, the Swedish Agency for International Development, the United Nations Children's Fund (UNICEF), and other organizations such as the Rotary Club and Merck Laboratories.

Conclusion
Honduras conducted a successful mass vaccination campaign against measles and rubella, despite difficulties linked to a national health emergency. Because coverage for the 2002 campaign was only 93% in men aged 5-39 years and women aged 5-49 years, supplementary activities were required to reach the original objective. During the 2003 NIDs, searches for non-vaccinated populations were conducted and MR coverage reached 98% at national level.

Authors: Ma Berenice Molina, Regina Trivelin Daron, Maria Aparicio Paredes, Expanding Program on Immunization, Ministry of Health, Honduras.

References:


June 2007, Volume XXX, Number 3

Rubella and CRS Elimination in El Salvador

Introduction

Between 1997 and 2004, El Salvador conducted a mass vaccination campaign targeting men and women aged 5-39 years (47% of the country's population), using the MR vaccine (Table 1). For the first two weeks of the campaign, activities targeted captive populations in workplaces, schools, and universities. In addition, vaccination posts were set up in areas where people congregate, such as markets, malls, and bus stops. The following four weeks were devoted to door-to-door vaccination, a significant effort to reach the country's rural areas.

Over 4000 health workers worked exclusively for the campaign. The overall coverage reached 99%, with 2,796,391 persons vaccinated.

Daily progress monitoring at municipal level and weekly monitoring at central level played a key role in solving problems so they could be corrected in a timely fashion. For example, by the fourth week of the campaign, it had become evident that males aged 20-34 years had coverage levels significantly lower than other groups. Therefore, the communication messages were directed at this age group and helped with improving coverage.

Another key component of the campaign, besides weekly administrative coverage monitoring, was rapid coverage monitoring, a tool developed to verify that vaccination targets had been achieved. RMc was key in identifying pockets of unvaccinated people. In the end, more than 380 RCM were conducted, all reporting coverage levels >95%. It is worth noting that El Salvador was the first country in the Americas to conduct so many RCM activities as a part of its rubella elimination campaign.

MR was not offered to pregnant women, yet 909 pregnant women were inadvertently vaccinated. Fifty-nine (6.5%) of them were classified as being rubella susceptible at the time of vaccination. All babies

Campaign Implementation
Between April and May 2004, El Salvador conducted a mass vaccination campaign targeting men and women aged 5-39 years (47% of the country's population), using the MR vaccine (Table 1). For the first two weeks of the campaign, activities targeted captive populations in workplaces, schools, and universities. In addition, vaccination posts were set up in areas where people congregate, such as markets, malls, and bus stops. The following four weeks were devoted to door-to-door vaccination, a significant effort to reach the country's rural areas.

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Rubella Transmission and Susceptibility Following the Campaign in El Salvador

Because of a small rubella outbreak (2 confirmed cases) among students aged 10-14 years in August 2006, a cohort analysis was conducted to evaluate if all cohorts were protected against rubella. The analysis demonstrated that (1) Some groups had not been targeted for MMR or MR vaccination; (2) Not all children had received an MMR prior to their fifth birthday (Figure 1); and (3) The measles follow-up campaign planned for 2005, to counteract the build-up of susceptibles, since the MMR vaccine is not 100% effective, had not been conducted. Therefore, to prevent the reestablishment of rubella transmission, over 180,000 students aged 10-14 years were vaccinated in November 2006. To achieve rubella elimination, sustain measles elimination, and limit outbreaks following importations, it is necessary to ensure that all cohorts are protected. To this end, a follow-up campaign targeting children aged 15-18 years (between 2002-2006) is scheduled for June-July 2007 and a mass vaccination campaign for students aged 11-17 years is planned for 2008.

The 2006 outbreak in El Salvador and the subsequent cohort analysis illustrates how, despite high routine MMR coverage and a successful mass vaccination campaign, some groups may remain unprotected. When planning mass vaccination campaigns for disease elimination, countries must thoroughly analyze the strategies implemented and the results obtained to ensure that all potentially susceptible groups are targeted. Also, even when the routine immunization schedule recommends the administration of two MMR doses, follow-up campaigns remain necessary if 95% coverage cannot be guaranteed for both doses in all municipalities.

Table 1. Rubella and CRS Elimination in El Salvador: Vaccination Strategies, 1997-2007

| Years | Introduction of the first do... | Vaccine Target Population | Coverage
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>Introduction of the first do...</td>
<td>MMR Children aged 1 year</td>
<td>&gt;90%</td>
</tr>
<tr>
<td>1999</td>
<td>Healthy Childhood Program</td>
<td>MMR Children aged 6-12 years</td>
<td>100%</td>
</tr>
<tr>
<td>1998</td>
<td>Door-to-Door Vaccination</td>
<td>Rubella Women aged 15-25 years</td>
<td>80%</td>
</tr>
<tr>
<td>2000</td>
<td>Introduction of the second do...</td>
<td>MMR 1999: cohort of children aged 6 years</td>
<td>80%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2000-2006: cohort of children aged 4 year</td>
<td></td>
</tr>
<tr>
<td>2001</td>
<td>Follow-up Campaign</td>
<td>MMR Children aged 1-4 years</td>
<td>98%</td>
</tr>
<tr>
<td>2004</td>
<td>Vaccination Campaign</td>
<td>MMR Men and women aged 15-39 years</td>
<td>99%</td>
</tr>
<tr>
<td>2007</td>
<td>Follow-up Campaign</td>
<td>MMR Children aged 1-6 years (goal)</td>
<td>95%</td>
</tr>
</tbody>
</table>

* Scheduled to end July 2007.

The national social communication campaign was designed with clear messages directed at two population groups: adolescents and university students and women with children. Spots were aired during peak listening and viewing time on the favorite radio and TV channels of the two target groups. Posters and leaflets were distributed to the provinces for placement in high-traffic public areas. Messages were published in nationally circulated magazines and newspapers. In addition, the material was distributed in digital format to the provinces to be adapted according to local situations. Campaign information was also disseminated through web pages, toll-free numbers, and an e-mail address created specifically for the campaign.

Campaign Implementation

The campaign was launched on 1 September, 2006 and was planned to last 60 days. After the first month, only 5 of the 24 provinces had reached coverage rates >80% and the national coverage was only 46%. Provinces with high populations, such as Buenos Aires, Capital Federal, and Santa Fe had coverage around 40%.

Coverage Among Persons Vaccinated Against Measles, Rubella, Mumps, and Varicella by Year of Birth, El Salvador, 1965-2006

**Note:** Data are from Rubella Watch (www.rubellawatch.org) and the Ministry of Health, El Salvador. Source: Ministry of Health, El Salvador.

Since 1996, the Ministry of Health (MOH) of Argentina has been implementing immunization and surveillance strategies based on the analysis of rubella trends, susceptible groups, and the cost-benefit of interventions. The MOH is committed to reach the goal of rubella and congenital rubella syndrome (CRS) elimination by 2010.

Seroprevalence studies, the vaccination coverage through the routine program and vaccination campaigns in Argentina, have provided the framework to develop the rubella and CRS elimination strategy. Following the WHO recommendations, the rubella vaccination campaign in Argentina was implemented through coordination with the national, provincial, and local governments.

The vaccination campaign began eight months before implementation. Technical documents were developed in support of the campaign, such as technical and operational guidelines, local microplanning guides, vaccine manuals, and question and answer documents and follow-up protocols for pregnant women inadvertently vaccinated. Training was provided, first for managers of the province programs through four regional workshops. To strengthen training and microplanning at local levels, the workshops were repeated in the 512 departments of the provinces with funds from the national government. Vaccinators and supervisors were trained in 2,171 municipalities.

The campaign included diverse organizations, such as scientific societies (pediatrics, obstetrics and gynecology, perinatology, neurology, speech therapy, the Argentine Medical Association, the Family Medicine Association, and nursing), the Rotary Club, Association Apoyo Familiar (Association for Family Support), Asociacion Mensajeros de la Paz (Association of Messengers for Peace), and international cooperation agencies (UNICEF and PAHO). The Argentine Federation of OB-Gyn Societies, the Argentine Association of Pediatricians Society, the Argentine Perinatology Society, the Argentine Association of Family Medicine, and the Argentine Nursing Federation signed a declaration of support to the vaccination campaign.

The national social communication campaign was designed with clear messages directed at two population groups: adolescents and university students and women with children. Spots were aired during peak listening and viewing time on the favorite radio and TV channels of the two target groups. Posters and leaflets were distributed to the provinces for placement in high-traffic public areas. Messages were published in nationally circulated magazines and newspapers. In addition, the material was distributed in digital format to the provinces to be adapted according to local situations. Campaign information was also disseminated through web pages, toll-free numbers, and an e-mail address created specifically for the campaign.
Rubella and CRS articles

To make matters worse, a rumor began to circulate in late September through e-mail chains, messages alleging that the vaccine had sterilizing properties. To clear all doubts among the population, the MOH developed a document on the quality and safety of the vaccine. The document was widely disseminated throughout the provinces and to the media. Health authorities granted radio, television, and newspaper interviews while scientific societies put out technical statements.

In order to reach the campaign goal, vaccination activities were extended until November. Vaccination strategies were adjusted based on coverage evaluations among different age groups.

Campaign Results

By campaign end, the national coverage reached 98.836% (n=6,718,314 women vaccinated) (Figure 1). All provinces except Buenos Aires (89%) exceeded the level of 95% coverage. Coverage in groups aged 15-19 years and 20-29 years reached levels >95%. In major cities the coverage in the group aged 30-39 years did not meet expectations, reaching 88% at national level.

During monitoring activities, reasons given by women for not being vaccinated were that they had been previously vaccinated, they had positive serology results, they did not plan to have more children, they were absent when the vaccinators visited their place of employment or house, or they did not have time to come to the health center.

A total of 1,257,555 men were vaccinated, mostly men in categories such as the armed forces, students, health care personnel, and employees at border posts. Provinces that vaccinated the highest proportion of men (>50% of male population) were Córdoba, Mendoza, and Catamarca.

The MOH national toll-free line received more than 25,000 calls and staff answered 32,273 questions during the campaign. Close to 3,000 electronic messages were answered and the e-mail address remains in use since vaccination is still planned on demand, by the health services. Reasons for consultation were as follows: where to get vaccinated (55%), vaccination and pregnancy (20%), indication and contraindication (15%), and rumor on adverse events contained in the vaccine (10%).

To verify coverage level, health authorities are using rapid coverage monitoring, the tool recommended by PAHO, in each of the country’s departments. The total number of persons to survey is 83,275 in 2,256 clusters.

Conclusions

The hard work of the health personnel, who demonstrated its strong commitment to disease prevention, and the response from the population to vaccination activities, primarily the adolescents, must be commended. Thanks to the rubella campaign, the immunization program at national and provincial levels has been strengthened in key areas, such as organization and microplanning, effective vaccination tactics, management of vaccination safety crisis, design and use of information systems, supervision, monitoring, and evaluation.

Following the campaign, a national technical team was formed to analyze and implement the strategies required to reach those not vaccinated during the campaign, particularly men. RCM will be used as part of the strategy to completely the vaccination of men. The strengthening of rubella and CRS surveillance is an essential component of the plan since it will allow for the evaluation of results and the certification of the goal of rubella and CRS elimination in Argentina by 2010.

Authors: Direction of Epidemiology, Ministry of Health, Argentina

June 2007, Volume XXX, Number 3

Lessons Learned from Rubella Vaccination Campaigns in the Americas

General Lessons Learned

• The vaccination of both men and women is required to achieve the elimination of rubella and congenital rubella syndrome, and to strengthen measles elimination efforts in the Americas.
• Planning for a mass vaccination campaign targeting women and men of different age groups not usually targeted by national immunization programs requires intensive planning, programming, and promotion, beginning at least six months before campaign launch.
• The planning stage must be systematically conducted to strengthen coordination and productivity of vaccination activities, and must include the preparation of crisis management plans to confront any crises that may arise during the campaign.
• Systematic coordination between the Ministry of Health and health authorities at all levels is essential for campaign success, particularly when developing guiding materials, integrating management levels, local, provincial, and national, or mobilization and vaccination tactics, data analysis and decision-making, monitoring, and evaluation.
• Launching ceremonies and active participation from the President, Minister of Health, other dignitaries, and the media are key in maintaining the campaign on the public agenda throughout its duration.
• Progress monitoring, performed daily by municipalities and weekly by the Ministry of Health, is necessary to identify low coverage areas.
• Supervisory teams must be empowered and maintained to identify situations requiring additional support to reach the campaign goal.

Lessons Learned in Argentina

• Training and joint collaboration between all sectors from the onset of campaign organization allowed an effective response to a rumor regarding the composition and quality of the vaccine. Permanent access to information through toll-free lines, web sites, and e-mail was extremely useful to clear doubts. Consequently, the rumor had a minimal impact on coverage results while the faith of the population in the routine vaccination program was strengthened.
• The weekly analysis on coverage progress took place in the office of the Ministry of Health, and was useful to strengthen strategies.

• The experimental use of an on-line information system during the campaign was an invaluable contribution to the routine immunization program. It will help accelerate the program’s implementation and will allow the registering of coverage for all vaccines in the immunization schedule by place of residence.
• RCM implemented in a coordinated manner by each province down to its local levels, with cooperation from the Ministry of Health, proved to be a valuable supervision and evaluation tool.

• The diversity and efficiency of the tactics used by each province to mobilize and inform the population were a useful contribution to immunization strategies targeting adolescents and adults.

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1 Events supposedly attributable to vaccination and immunization.
2 National Immunization Days
3 Rapid coverage monitoring.

Rubella and CRS articles

June 2007, Volume XXX, Number 3

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Vaccination Campaign Phases for Rubella and CRS Elimination in the Americas

Most countries of the Americas that implemented rubella campaigns conducted their activities according to the steps described in Figure 1:

1. Targeting the captive population in work places, schools, and other institutional settings (jails, armed forces quarters) by vaccination teams in addition to vaccination posts located in high traffic areas or places where people congregate, and health units where vaccination is routinely provided.

2. Adding door-to-door vaccination to regular activities.

3. Conducting rapid coverage monitoring (RCM) towards the end of the campaign to ensure that no population group or remote area is left unvaccinated.

4. Offering MR (measles-rubella) post-partum since the vaccine is not administered to pregnant women to avoid any association between the vaccine and adverse pregnancy outcome.

5. Conducting independent coverage verification, and recognizing each municipality that has achieved the campaign goal.

In addition to the above-steps, some countries introduced a “Central Day,” at the campaign’s half-way point, to provide an additional opportunity for those who have not yet sought vaccination. This served as a “re-launching” of the campaign with support from the media, the President, and other dignitaries to reinforce the public messages. A similar activity can be repeated toward the end of the campaign.

As shown in the figure, MR campaigns for rubella elimination, unlike vaccination campaigns targeting children, emphasize vaccination on weekends when adolescents and adults are more available. Social communication and mobilization are adapted to each step so that messages are targeted to the populations most likely to be captured during each phase.

In the United States, 95% of infants are screened for hearing loss before hospital discharge or shortly thereafter. This represents a dramatic increase from fifteen years ago when only 3% of newborns received such screening. Due to advances in technology, screening for hearing has become the standard of care.

In February 2007, the Ministry of Health (MOH) of Costa Rica, PAHO, the American Academy of Pediatrics, the Costa Rica Pediatric/Neonatology Academy, and the US National Center for Hearing Assessment and Management (NCHAM, located at Utah State University), have collaborated to provide newborn hearing screening and follow-up services to better serve children born with hearing loss. The MOH is leading a movement to identify hearing loss early through a comprehensive screening and management program. A needs assessment through Dr. Karl White, the NCHAM director, Dr. Karen Muñoz, an audiologist, and Dr. Cooper to work with the MOH in September of 2006. The team visited hospitals and intervention programs to learn about current services. Screening procedures were also demonstrated.

Six Costa Rica physicians represent pediatrics, audiology, otolaryngology, and the MOH then came to St. Louis, Missouri, in February 2007 to learn more about screening, diagnosis, and intervention procedures. This was an opportunity to observe programs “in action” and discuss next steps for Costa Rica.

Infants who are found to have a hearing loss benefit the most when they are enrolled in early intervention programs prior to 6 months of age. To reach this goal, health care providers play a central role. Ensuring that every child with hearing loss is identified and is provided necessary services as early as possible requires a systematic approach to screening and follow-up. That is what the collaboration is establishing in Costa Rica. Since the critical periods for language development are so time-sensitive, the goals will include screening by age one month, diagnosis by age three months, and intervention, including amplification and educational intervention, by age six months.

Early hearing detection and intervention presents many challenges. But the benefits obtained from implementing such programs may prove to be as significant as what has been found elsewhere. In the final analysis, the EHDI demonstration program in Costa Rica is another example where rubella and CRS elimination strategies serve to promote excellence in primary health care.

For more information on newborn hearing screening and management visit these websites:
- www.babyhearing.org
- www.infanthearing.org
- www.medicalhomeinfo.org/screening/hearing.html
- www.cdc.gov/nhsddd/ehdi/

To view a 6-minute video explaining more about the hearing screening process, go to http://www.infanthearing.org/videos/index.html and select the Sound Beginnings (new) video.

Pan American Health Organization

 Rubella Watch

EPI Newsletter

Volume XXIX, Number 3

June 2007

Changing Lives: Newborn Hearing Screening in Costa Rica

During rubella immunization activities, conversations between Dr. Maria Ávila, then Director of Infectious Diseases at the National Children’s Hospital and now Minister of Health, PAHO Advisor Dr. Louis Z. Cooper, and Drs. Carlos Castillo-Soleranino and Jon Andrus from the PAHO Immunization Unit, focused on the possibility of implementing an Early Hearing Detection and Intervention (EHDI) demonstration program in Costa Rica. Since congenital hearing loss is the most frequent manifestation of congenital rubella syndrome (CRS), an EHDI program would have the combined advantage of serving as an excellent surveillance instrument for CRS and changing the lives of children found to be congenitally hearing-impaired, based on the new technologies for hearing testing and amplification, and early education.

Babies rely on hearing to develop spoken language. An infant’s auditory system and brain are shaped by sound and by caregivers’ voices long before a first word is spoken. However, because hearing loss is an “invisible” condition even trained health care professionals cannot reliably identify young children with hearing loss through observation alone. And when hearing loss goes undetected, early language learning is impeded and subsequent reading, academic, and social skills can also be severely compromised. This severe morbidity can now be prevented by EHDI, changing the lives of children and their families, and providing cost-saving benefits over their lifespan.

Dr. Karen Magill teaching newborn hearing screening.

The XIX Meeting of the Central American Region, Mexico, and the Latin Caribbean

The XIX Meeting of the Central American Region, Mexico, and the Latin Caribbean on vaccine-preventable diseases took place in Santo Domingo, Dominican Republic, from 6-8 June 2007. Delegations from Costa Rica, Cuba, the Dominican Republic, El Salvador, Guatemala, Haiti, Honduras, Mexico, Nicaragua, and Panama participated in the meeting.

Rubella and Measles

Countries of the Region have demonstrated progress in effectively interrupting endemic rubella transmission. In addition, mass vaccination campaigns conducted in the Region have been instrumental to sustain measles elimination. All but one of the 345 measles cases reported in the Americas since 2005 have been in countries that still had not conducted or concluded a mass vaccination campaign against measles and rubella in adolescents and adults.

Integrated and quality epidemiological surveillance of measles and rubella, including case confirmation through laboratory tests, is a fundamental element to document the rubella and measles elimination in the Americas. Furthermore, molecular epidemiological data can be used to confirm rubella elimination. Finally, CRS surveillance is recommended to identify infants in whom this syndrome is suspected.

Recommendations:

- The Dominican Republic and Guatemala should be congratulated on their decision to program mass vaccination campaigns targeting men and women (adolescents and adults) with the MR (measles-rubella) vaccine in the second 2007 semester and the first 2008 semester, respectively. El Salvador should also be congratulated for implementing a follow-up campaign for measles and rubella elimination in 2007.

- The accumulation of measles susceptibles should continue to be monitored. A high quality follow-up campaign (coverage >95% in every municipality) is necessary whenever there is evidence of an accumulation of susceptibles.

- Countries should identify municipalities with MMR coverage <95%.
coverage <95% and design strategies to achieve and maintain 95%-100% coverage in all municipalities.

- Countries should ensure that all residents of the Americas that travel to endemic measles and/or rubella areas are immune to measles and rubella before their departure.

- Countries should develop plans to deal with importations, ensuring that a dedicated team is on hand and available funds can be rapidly released.

- Countries should maintain active epidemiological surveillance for rubella in all the municipalities, with a sensitivity of at least 2 suspect cases per 100,000 inhabitants and at least 1 suspect case in municipalities with <100,000 inhabitants, and conduct active case-finding in high-risk municipalities and silent areas. Furthermore, rapid in-vestigation of any rubella-like cases should be launched before serology results are available and include representative samples for viral detection.

- Experience in the Region has proven that CRS surveillance presents many challenges. Since CRS clinical manifestations during the first year of life are not specific and vary widely, it can be difficult to suspect and diagnose this syndrome by clinical methods. However, case methods should be investigated to improve the sensitivity and specificity of the surveillance system, strengthen reports through sentinel sites, and encourage the use of TORCHS as part of the surveillance system.

- While investigating sporadic outbreaks, it is critical to monitor the last stages of measles and rubella elimination, a second sample should be collected for serology and an epidemiological analysis conducted when the laboratory result is not clear. Also, samples should be collected for viral isolation or detection by molecular methods.

- A second sample for rubella IgM testing should be collected in pregnant women from whom a serum sample was collected in the five days following disease onset, regardless of a positive or negative result.

- Meetings among Epi epidemiologists and laboratory staff must be held as a crucial step toward promoting coordination and exchange of information.

- Countries should start documenting the interruption of measles and rubella endemic transmission based on the following components: a) epidemiological information on measles, rubella, and CRS (vaccination impact); b) vaccination coverage and analysis of protection; c) quality of the surveillance system; d) data on molecular epidemiology of measles and rubella virus; and e) data from available seroprevalence studies.

Rubella and CRS articles

Table 1. Confirmed Rubella Cases by Selected Municipalities, Haiti, 2006

<table>
<thead>
<tr>
<th>Year</th>
<th>Department</th>
<th>Municipality</th>
<th>Cases</th>
<th>Laboratory Testing</th>
</tr>
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<tbody>
<tr>
<td>2003</td>
<td>Nord-Est</td>
<td>Mombin Crochu</td>
<td>6</td>
<td>IgM+</td>
</tr>
<tr>
<td>2004</td>
<td>Sud</td>
<td>Cayes</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>2005</td>
<td>Nord-Est</td>
<td>Duansimith</td>
<td>2</td>
<td>IgM+</td>
</tr>
</tbody>
</table>

Table 2. Distribution of Non-traumatic Cataract Cases Operated on at Breda Hospital, by Age Group, Haiti, 2003 - November 2006

<table>
<thead>
<tr>
<th>Year</th>
<th>1 to 4</th>
<th>5 to 10</th>
<th>11 to 17</th>
<th>18 to 39</th>
<th>40 to 59</th>
<th>60 to 79</th>
<th>80 to 99</th>
<th>Age Unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>13</td>
<td>11</td>
<td>11</td>
<td>11</td>
<td>7</td>
<td>7</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2004</td>
<td>16</td>
<td>11</td>
<td>11</td>
<td>11</td>
<td>7</td>
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<td>0</td>
</tr>
<tr>
<td>2005</td>
<td>11</td>
<td>10</td>
<td>9</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>TOTAL</td>
<td>40</td>
<td>30</td>
<td>22</td>
<td>22</td>
<td>14</td>
<td>14</td>
<td>0</td>
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</tbody>
</table>

February 2008, Volume XXX, Number 1

27th Pan American Sanitary Conference Adopts Resolution for the Elimination of Rubella and CRS in the Americas

During the 27th Pan American Sanitary Conference held in October 2007 in Washington, D.C., the Member States of the Pan American Health Organization (PAHO) expressed strong support for the rubella and congenital rubella syndrome (CRS) elimination initiative currently underway in the Region. As all countries of the Americas implement supplementary immunization activities to complement routine vaccination programs, the combined strategy has resulted in a substantial decrease in rubella incidence. The number of confirmed rubella cases decreased by nearly 98% between 1998 and 2006 (from 135,947 to 2,998), and the number of confirmed CRS cases from 36 in 2002 to 14 in 2006. The impact on reducing rubella incidence has been greater in countries that vaccinated men and women in their campaigns.

In addition to interrupting rubella transmission, mass vaccination campaigns have greatly contributed to consolidating measles elimination. All 402 measles cases reported in the Americas since 2006 (2007 provisional data) have occurred in countries that had not yet implemented or completed a mass measles/rubella vaccination campaign among adolescents and adults.

By adopting Resolution CSP27.R2, PAHO Member States seek to build on the success achieved in the Region. Two previous resolutions calling for rubella and CRS elimination in the Americas by 2010 (2003) and reaffirming the elimination initiative as a Regional priority (2006) have been passed. Resolution CSP27.R2 also calls for national commissions to be formed to verify rubella and CRS elimination, under the guidance of an Expert Committee (see text box on page 42).

Below: Dr. Margarita Cedeño de Fernández (left), First Lady of the Dominican Republic, receiving a plaque from Dr. Maria Rosas Pertega, PAHO Director, during the 27th Pan American Sanitary Conference. Dr. Cedeño was recognized as goodwill ambassador for her humanitarian work in favor of rubella elimination and her advocacy efforts to avoid disabilities caused by the rubella virus throughout the Americas. Above: Dr. Cedeño called for all governments of the Region to intensify their efforts in the fight against vaccine-preventable diseases.
Rubella Watch

Volume XXX, Number 3

CRS Elimination: Costa Rica Makes History

By the end of 2008, all countries and territories of the Region of the Americas will have implemented strategies to reduce populations susceptible to measles and rubella and reduce the incidence of the devastating birth defects associated with congenital rubella syndrome (CRS). The approval of Resolution CSP27.R2 by the 27th Pan American Sanitary Conference in October 2007 defined the final steps for reaching the goal of rubella elimination by 2010, calling for the formation of an Expert Committee responsible for the documentation and verification of the interruption of the endemic rubella and measles virus transmission in the Americas.

High quality and integrated measles/rubella surveillance, CRS surveillance, and vaccination coverage results, supported by sustained technical cooperation, are required to verify the interruption of virus transmission. PAHO staff, in collaboration with Consultants from the US Centers for Disease Control and Prevention (CDC), considered several information components to be included in a Regional protocol for verifying the interruption of endemic transmission. It is essential that the data collected for each component be complete and consistent with other available data sources. The information components included were as follows:

- The development and evolution of national immunization programs;
- Measles, rubella, and CRS epidemiological data (impact of vaccination interventions);
- The analysis of protected cohorts, which includes vaccination coverage, routine immunization, follow-up campaigns, adolescent and adult mass campaigns, and post-partum vaccination (post-campaign);
- The quality of the surveillance system, including completion of indicators, active case searches, compatible cases (surveillance error), and excluded cases;
- Meticulous epidemiology; i.e., Available seroprevalence studies when needed.

The protocol will be tested in a pilot country. A panel of experts will convene to review the results from the pilot study and finalize the regional protocol for dissemination and implementation at country level.

In accordance with Resolution CSP27.R2, an international Expert Committee will independently verify that endemic rubella and measles virus transmission has been interrupted in the Western Hemisphere. Special national commissions in each country will assess country-specific situations and prepare the required documentation, as defined by the protocol. The international Expert Committee will be charged with completing the final analysis of all available data to determine definitive verification and report the findings to PAHO’s Directing Council in 2010.

June 2008, Volume XXX, Number 3

Measles, Rubella, and CRS Elimination: Costa Rica Makes History

On 14 May 2008, Costa Rica became the first country of the Region to create a national commission for documenting the elimination of measles, rubella, and congenital rubella syndrome (CRS). The independent body will be comprised of national advisors and consultants who will collect and examine available country data as a step towards declaring Costa Rica free from measles, rubella, and CRS. At the conclusion of this process, the commission will submit its final report to the Minister of Health who will officially present it to an international Expert Committee (see Immunization Newsletter, February 2008).

From May 2007 to April 2008, Costa Rica also served as a pilot country to test the regional protocol on elimination that PAHO developed to assist countries with data collection and analysis. In May 2008, national and international participants convened in San José to discuss the regional protocol and incorporate recommendations based on the lessons learned during the initial collection of evidence. Data on rubella and CRS elimination in Costa Rica, and (2) determine the next steps to implement to achieve the goal of elimination certification in Costa Rica. Meeting participants included representatives from Costa Rica’s Ministry of Health, Health Security Fund, and Birth Defects Registry Center; country experts in the field of neonatology, ophthalmology, and cardiology; international experts from the World Health Organization, the U.S. Centers for Disease Control and Prevention, PAHO, and the Oswaldo Cruz Foundation; and the former president of the American Academy of Pediatrics.

A key recommendation for improving the regional protocol was to develop a document providing countries with additional guidance on how to inter-relate all the pieces of evidence—including detailed information on the national immunization program, epidemiological analysis of measles, rubella, and CRS, surveillance quality, molecular epidemiology, and population immunity—to support the argument of elimination.

In this context, Rubella Watch, readers of the Region of the Americas have been witnesses to the impressive progress achieved towards eliminating rubella and congenital rubella syndrome (CRS). Today, the Region is on the cusp of reaching the goal of elimination, while it still faces multiple challenges to protect the achievements of countries and maintain measles elimination.

In this context, Rubella Watch puts on a new face, with a clearer and more streamlined design that reflects the permanent presence of the Region and the world have led over measles and rubella. Rubella Watch will continue to publish reports on the efforts all countries of the Americas are making to quickly respond to constant importations. It will also report on the ongoing implementation of strategies to maintain the elimination of both the rubella and measles viruses.

The implementation of vaccination strategies rapidly changed the epidemiology of rubella in Brazil. During 1997 and 1998, children aged 1-9 years experienced the highest incidence of rubella, with 15 cases per 100,000 children. During 1998 and 1999, peak incidence has shifted to the 15-29 year age group, with 13 cases per 100,000 adolescents and adults of both sexes.

Follow-up MMR campaigns for children aged 1-4 years were conducted in 2000 and 2004, and mass vaccination of women of childbearing age (age groups ranging between 12-19 years depending on state) with MMR vaccine was conducted between 2001 and 2002 in most states to prevent CRS cases. These strategies reduced rubella incidence in the population to a low of one case per 100,000 population in 2006.

However, an outbreak of rubella that began in southern Brazil in 2006 led to rubella outbreaks in major cities in 2007, concentrated among persons not included in previous vaccination strategies. By 2006, rubella cases were occurring mainly among adolescents and adult men, while pools of susceptible individuals sustained viral circulation.

In order to reach the 2010 goal of rubella elimination, the government of Brazil planned the mass vaccination of adolescents for 2008. The national vaccination campaign would also help maintain measles elimination by vaccinating groups of possibly susceptible adults against measles.

Target Population for the Campaigns

In order to define the target population for the national rubella campaign, national immunization program data on MR vaccination administered between 1992 and 2006 were analyzed to identify age groups with the greatest number of previously unvaccinated individuals (Figure 1). This analysis indicated that groups missed by previous rubella vaccination strategies were concentrated among adults aged 20 years and older: 60% of men between the ages of 21-25 years and 95% of those 26 years and older were likely unvaccinated.

Although a much smaller percentage of women were likely to be unvaccinated as a result of prior vaccination campaigns, as much as 60% of women aged 16-40 years had likely been missed.

The analysis of prior vaccination opportunities defined the target population for rubella vaccination. In all 27 states, the campaign would target women aged 10-29 years and men aged 20-39 years, with an estimated 31.4 million men and 12.1 million women in this age group. In addition, five states (Maranhão, Minas Gerais, Mato Grosso, Rio de Janeiro, and Rio Grande do Norte) would include adolescents aged 12-19 years due to estimated MMR coverage below 90% during initial catch-up vaccination among children aged 1-11 years in these states. There was an estimated 6.7 million persons in this age group in the five states. The total population to be vaccinated was 70,149,025 persons.

Vaccines

Two vaccines were used for the Left: Dr. Oscar Arias Sánchez, President of Costa Rica, signing the country decree creating the national commission on 14 May 2008. To his left in the background is the President of the Parliament and to his right Dr. Maria Luisa Fola Aguinio, Minister of Health.
national campaign. For the 20-39-year old age group, approxi-
mately 70 million doses (in 10-dose vials) of MR vaccine were imported and distributed to all state vaccination pro-
grams.

For the 12-19-year age group, 10 million doses (also in 10-dose vials) of MR vaccine produced by Bimunganinos, a Brazilian public sector vaccine manufacturer, were distributed to the five states vaccinating this age group. Both vaccines included the Wistar RA 27/3 rubella vaccine strain. The MR vaccine included the Edmonton Zagreb measles strain, while the MMR vaccine included the Schu Schwartz measles strain and the Brazilian public sector vaccine Zagreb measles strain. From May 2007 to May 2008, 10-dose vials) of MMR vaccine were distributed to all state vaccination programs. For the 12-19-year age group, approxi-
mately 70 million doses (in 10-dose vials) of MMR vaccine were imported and distributed to all state vaccination pro-
gams. For the 20-39-year old age group, approximately 70 million doses (in 10-dose vials) of MMR vaccine were imported and distributed to all state vaccination programs.

Vaccination Strategies
Prior to the launch of the media campaign, vaccination activities were conducted in indigenous populations throughout Brazil, as well as in institutions and workplaces with populations in the target age range, including factories, large companies, public institutions, and universities.

The national rubella elimination campaign was launched at a primary health care center in the city of Niteroi, in the state of Rio de Janeiro, on Saturday, 9 August 2008. The date was chosen to coincide with the second national immunization day against polio for children under 5 years of age.

The goal of the first phase of the rubella elimination campaign was to provide MR vac-
cines for adults aged 12-19 years (and MMR vaccine for adolescents aged 12-19 years in five states) at more than 30,000 vaccination posts throughout Brazil that rou-
tinely administer vaccines.

Working hours were extended in many health centers during the period of the campaign, including Saturdays and some weeknights. Persons were vaccinated regardless of previous vaccina-
tion or history of rubella.

Pregnant women were in-
structed to defer vaccination up to 3 months after birth. MMR vaccines for post-partum vac-
cination were distributed to maternity and health centers.

In addition to vaccination at health care centers, mobile teams set up vaccination booths in key locations with concentrations of people and transit points, including marketplaces, commercial and shopping plazas, ports, airports, bus termi-
nals, metro stations, stadiums, recreational areas, churches, and schools.

Mobile vaccination teams were used throughout the campaign, providing flexibility to reach groups of individuals that had not been vaccinated at health care centers. Saturday, 30 Au-
gust was chosen as a central day for national media to mo-
tivate those persons who had not yet been vaccinated to seek out a vaccination post.

Communication and Social Mobilization
Prior to the launch of the media campaign, a survey of Brazilians in the target age population showed that 94% of those surveyed would re-
ceive vaccine to help eliminate rubella. As a result, the com-
munication strategy focused on disease elimination.

For the launch (together with the polo immunization day), the slogan was “Vacinação é nossa programação familiar” (“Vac-
cination has become a family program”). Television and radio spots reminded audiences that Brazil had eliminated polo and now the country was eliminating rubella. Parents were encour-
gaged to take their children vaccinated. Over the next 14 weeks, immunization teams worked in areas with low cov-
ervation to find unvaccinated groups and provide additional vaccination opportunities.

When all vaccination activities were concluded, 67.5 million doses of MR and MMR vac-
cines had been administered, corresponding to 95.8% cover-
age of the target population. Coverage among females was 98.4% versus 93.1% among males. Estimated coverage among 20-39-year olds was 94.9% while coverage among 12-19-year olds surpassed 100% of the target population in the 5 states. Possible expla-
nations include underestimated populations of adolescents in these 5 states and vaccination of children younger than 12 years of age during the campaign (Figure 2).

Vaccination in Border Areas
Brazil shares borders with all other countries of South America except Chile and Ecuador. With the exception of Argentina, all of Brazil’s neigh-
bors had completed supplementary immunization activities to eliminate rubella prior to 2008. During Brazil’s national rubella campaign, vaccination activities were conducted in border areas in order to vacci-
uate Brazilians living in neighboring countries as well as populations in transit who may have missed previous opportuni-
ties to be vaccinated against rubella.

Vaccination Safety
Brazil’s national immunization program maintained a surveillance system for adverse events tem-
orally associated with vaccination. Events are reported by state or local immunization co-
ordinators. Training materials for the rubella campaign in-
cluded descriptions and frequ-
ecies of adverse events followed reporting administration of MR and MMR vaccines. Most were ob-
tained from clinical studies. Few data were available on the frequency of adverse events following administration of rubella vaccines. Risk stratification was used to assess adverse events follow-
ing vaccination activities.

When the vaccination campaign, the adverse event surveillan
tce system received 2,624 notifications of vac-
cine-associated adverse events, corresponding to a rate of 3.6 events per 100,000 doses ad-
mistered, which is much lower than rates that have been reported in the literature. In relation to the type of events, the most common were mild reactions: generalized rash (30 756: 29%); fever (313; 12%); lymphadenopathy (190; 7%); and local intense reac-
tions (pain/redness/heat) (517; 20%) because a high propor-
tion of the target population had previously been vaccinated or was immune, the incidence of adverse events following vaccination may have been much lower than expected in a non-immune population.

Information System
An online information system (Figure 2).

Dissemination of Best Practices
Technical support to state and municipal immunization pro-
grams from the national immu-
nization program helped to plan and evaluate vaccination activities.

During the campaign, PAHO/WHO assisted the Ministry of Health by bringing international campaign experts to assist in states with large populations and in those vaccinating both adolescents and adults. These consultants possessed vast experience in campaign planning, implementation, training, and evaluation and represented a new style of technical cooperation through the PAHO/WHO program.

In Brazil, the rubella vaccination campaign coincided with a peak in the number of confirmed rubella cases. Some states have confirmed that rubella cases may have been ex-
pessed both to wild-type rubella and vaccination.

The rubella campaign led to a steep decline in the number of confirmed rubella cases. Some experts have also noted that the rubella campaign coincided with a peak in the number of confirmed rubella cases. Some states have confirmed that rubella cases may have been expressed both to wild-type rubella and vaccination.

In this light, and having the presence of President Luiz Iná-
acio Lula da Silva, the Minister of Health, Dr. Jos Gomes Temporos, presented the "Final experiences and lessons learned in Brazil with countries in other regions beginning the process of rubella elimination.

Monitoring and Evaluation
To verify coverage estimates based on doses administered, vaccination teams were asked to interview 100 persons in the target age group in a ran-
domly selected area when ad-
munistered coverage had reached 95%, or at the com-
pletion of planned activities. In total, 1-2% of the target population was interviewed. Based on data from 15 of 23 states, vaccination coverage was measured for 2008. The PAHO/WHO assisted the Ministry of Health by bringing international campaign experts to assist in states with large populations and in those vaccinating both adolescents and adults. These consultants possessed vast experience in campaign planning, implementation, training, and evaluation and represented a new style of technical cooperation through the PAHO/WHO program.

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President Lula da Silva celebrates the success of the “mega” vaccination campaign.

Rubella Watch

Report of the National Vaccination Campaign for Rubella Elimination* to the representative of the Pan American Health Organization/World Health Organization (PAHO/WHO) in Brazil.

April 2009 Volume XXXI, Number 2

National Campaign to Eliminate Rubella and Strengthen Measles Elimination in Haiti

In 1984, Haiti introduced the monovalent measles vaccine into its routine vaccination program with a single-dose schedule in children aged 9 months. Between 1990 and 1997, yearly immunization coverage with measles vaccine ranged from 24-54%, reaching the highest coverage of 85% in 1999.

Haiti was the only country in the Region without a vaccination program against rubella. The confirmation of a congenital rubella syndrome (CRS) case in 2004 brought attention to the underestimation of the problem, and incidence estimates indicated that new CRS cases in the country were between 1.5 and 4.5 per 100,000 live births per year. Furthermore, the improvement of surveillance and laboratory diagnosis led to the confirmation of 11 rubella cases in the country in 2006. A seroprevalence study conducted among 503 pregnant women in 2002 demonstrated that 95% of women aged 20-35 years had acquired natural immunity to rubella infection. In 2007, the Haitian Ministry of Public Health and Population (MSPP) decided to implement an immunization campaign using measles-rubella (MR) containing vaccine, and in accordance with the 2003 Directing Council Resolution, Haiti joined the rest of the Member States of the Pan American Health Organization (PAHO) in adopting a rubella and congenital rubella elimination (CRS) goal for 2010.

Several factors were considered to justify the campaign. These included: low MR vaccination coverage (57%-66% between 2004 and 2006)*; the accumulation of susceptibles, the continuous risk of importations due to the transient nature of the Haitian population; the formation of susceptible tourists in the country, and a weekly surveillance system for febrile rash illness.

Campaign Implementation

Collaborative efforts among high-ranking government officials, key stakeholders, community health workers, and non-governmental organizations provided instrumental in ensuring the success of the nationwide vaccination campaign. The main strategies for campaign implementation were:

- Establishing the commitment of high-level authorities from campaign inception, including active participation in the campaign launching event, to highlight the campaign as a national priority.
- Mobilizing resources from a multitude of strategic partners to cover operational and implementation costs.
- Implementing a pilot campaign to prepare for the national campaign and generate important lessons to improve existing vaccination strategies.
- Providing extensive training for health workers and school children.

Four phases of campaign implementation were targeted for the national immunization campaign. The phases targeted different areas. Phase 1, targeting rural areas, was initiated in June 2020, followed by Phase 2, targeting urban areas, in August.

The over-arching objectives of the campaign were as follows:

- Strengthen measles elimination and reduce the risk of importations to the country.
- Take the first steps towards rubella elimination.
- Strengthen measles elimination and reduce the risk of importations.

Secondary objectives as outlined in the national plan for the vaccination campaign included:

- Reinforce polio immunization to prevent the introduction of the disease or vaccine-derived poliomyelitis.
- Serve as a catalyst for the elimination of neonatal tetanus.
- Fight vitamin A deficiencies in children <5 years as well as against intestinal parasites in school children.

Several challenges were encountered to justify the campaign. These included: low MR vaccination coverage (57%-66% between 2004 and 2006)*; the accumulation of susceptibles, the continuous risk of importations due to the transitory nature of the Haitian population; the formation of susceptible tourists in the country, and a weekly surveillance system for febrile rash illness.

Several challenges were confronted and resolved over the course of the campaign planning, execution, and evaluation phases. These included initial concerns and insufficient prolonged commitment of the MSPP based on the assumption that campaigns and other activities would detract from the routine EPI program; operational constraints that required continuous resource mobilization efforts; shortage of qualified national staff to conduct surveys and lack of motivated local staff for the implementation of vaccination activities; nontraditional target population to be addressed through innovative social mobilization efforts; and unexpected sociopolitical and climatic emergencies occurring during the campaign period.

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Campaign Results

The pilot successfully reached more than 99,000 children and adolescents in the target population with the MR-containing vaccine in five rural municipalities and one urban area. Coverage reached 94% as verified by rapid coverage monitoring (RCM). The success of the pilot clearly demonstrated the demand for vaccination and other health interventions by a target population not generally targeted with immunization activities, as well as allowed the country to advance in the organization and planning process for the nationwide campaign.

The “rolling” campaign, which concluded in November 2008,

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Campagneประเทศที่ได้รับการยอมรับในเรื่องการฉีดวัคซีนเป็นจำนวนมาก ที่มีประสิทธิภาพสูง

Rubella Watch

EPI Newsletter

Mundo E O Brasil

Rubella


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The "rolling" campaign, which concluded in November 2008,
Rubella and CRS articles

Health and Integration Processes in the Americas: South America TCC Project: Measles- and Rubella-Free Borders

Introduction
The regional integration processes promoted by the Pan American Health Organization/World Health Organization (PAHO/WHO) in the Americas have created real opportunity for progress in social and health issues. In the Southern Cone, MERCOSUR is exploring the harmonization of health regulations, and the Andean Community of Nations (CAN) has a health sector integration mechanism, the Hipólito Unanue Agreement, which promotes individual and joint countrysides to improve the health of their peoples.

Projects for technical cooperation among countries (TCC) are examples of integration processes. As reciprocal horizontal processes, they are also described as South-South cooperation, in which two or more countries work together to build and joint capacities by sharing knowledge, skills, resources, and technologies.

PAHO/WHO has approved over 200 TCC projects since 1998 in areas such as: healthcare management, risk management, family and community health, environmental health, health services, and emergency management. In this article is described the first TCC to take place in South America, with an emphasis on vaccination in border areas for the elimination of rubella and congenital rubella syndrome (CRS) and the consolidation of measles elimination.

South American TCC: South American Borders Free from Measles and Rubella

Border areas are priority for PAHO/WHO Member States. The improvement of health conditions along border area populations helps reduce inequalities and contributes to the attainment of sustainable health benefits.

For this reason, PAHO/WHO supported the TCC project to immunize populations against measles and rubella in border areas of all countries sharing a border with Argentina and Brazil. From August to December 2008, both countries conducted simultaneous mass vaccination campaigns for the elimination of rubella and CRS. Twelve countries were involved in the project: Argentina, Bolivia, Brazil, Chile, Colombia, French Guiana, Guyana, Paraguay, Peru, Suriname, Uruguay, and Venezuela.

The South American TCC benefited from the political and technical support from MERCOSUR member countries and associated states. The final report of the meeting of Ministers of Health, held in June 2008 stated the following: “As Argentina and Brazil are virtually the last countries in MERCOSUR to conduct vaccination activities to eliminate rubella and CRS, neighboring countries are requested to simultaneously conduct joint cross-border vaccination and surveillance activities in neighboring municipalities.”

Brazil’s border is 15,719 km long and runs along 11 states. The 121 municipalities on the border have an estimated population of 3 million. Argentina’s border is 9,861 km long and runs along 20 provinces and 77 municipalities. Migration to Argentina consists largely of foreigners born in neighboring countries: Bolivia, Brazil, Chile, Paraguay, and Uruguay, who are known as “border migrants.” Border migrants to Argentina exhibit varied behavioral patterns.

Progress
Convened in Asunción, Paraguay, from 1-2 April 2009, representatives of the National Immunization Programs of the 12 border countries and the two countries that share borders with Argentina and Brazil reestablished their commitment to maintain the borders of South America free from measles and rubella by intensifying vaccination and surveillance activities during 2009.

At the South American TCC meeting—co-organized by MERCOSUR and the Andean Health Organization (ORAS)— delegates from the Ministries of Health of Argentina, Bolivia, Brazil, Colombia, Chile, Paraguay, Peru, and Uruguay presented progress achieved through vaccination in border areas. Overall, nearly 20,000 people were vaccinated primarily in formal border crossings during August-December 2008.

Among the important outcomes from the meeting was the commitment to hold transborder meetings to discuss the programming and evaluation of complementary activities. Each country will send a general directive to all the border municipalities to authorize these meetings. The expected working plan and the outline will be discussed and will be outlined in the directive. Furthermore, the southern border of Argentina and the northern border of Uruguay, and the eastern border of Argentina were identified as the main risk areas. Bolivia, in turn, will support the vaccination of the Brazilian students of the universities of Benín, Santa Cruz, and La Paz, despite the high flow of this population at formal and informal border crossings shared by both countries.

Among the main recommendations agreed upon by the delegates was the suggestion that a permanent working group on immunization be formed within MERCOSUR and the Andean Community of Nations (CAN) to address subjects of mutual interest and jointly implement solutions. These subjects include an intercultural approach to vaccination in border areas, mechanisms to address vaccination in informal border crossings, and the process and flow of epidemiological surveillance data in border areas. In addition, discussion may involve establishing regional recommendations for international travel arriving to the Americas with regard to their measles-rubella immunity, within the framework of the 2005 International Health Regulations (IHR).

Additional Activities at the Argentina-Brazil-Uruguay Border

One of the areas where measles and rubella elimination is considered to be at risk is the border between eastern Argentina, southern Brazil, and northern Uruguay. The border area is inhabited by millions of foreigners born in neighboring countries from Brazil and Uruguay recently met in the border city of Santana do Livramento to discuss specific activities to guarantee vaccination of the unvaccinated, how to handle the flow of people at borders, and coordinated cross-border surveillance for early detection of measles and rubella cases.

As part of Brazil’s 2008 rubella campaign, rapid coverage monitoring (RCM) was conducted in all municipalities along the Rio Grande do Sul, one of the states most affected by the rubella outbreak of 2007-2008 (n = 28,252). The group most affected by the outbreak was those aged 20-29 years, with men representing a higher proportion of the unvaccinated (25%). RCM results showed a lack of homogeneous vaccination coverage in municipalities of Rio Grande do Sul, and that campaign coverage was low, resulting in a collection of cases, largely men, who would not be protected against measles and rubella.

The reasons for this low coverage include overestimation of the Brazilian population; problems with access to vaccination (hours of operation, mobile teams); little publicity about the campaign; low immunization resources and logistical support; and the suspension of vaccination activities once the rubella outbreak in Rio Grande do Sul (December 2008).

The following activities were discussed and will be conducted along the border with
Several imported measles outbreaks have occurred in the Region of the Americas in recent years, with a small number of cases secondary to importation. In the period 2008-2009, there were 187 secondary cases from a total of 6.5 importations. In 23 cases, the source of the infection was unknown. Sixty percent of imported measles cases in the Americas during that period came from Europe, with outbreaks occurring in Argentina, Canada, Chile, Ecuador, Jamaica, Peru, and the United States. Mounting a rapid response to limit these outbreaks has involved the intensive mobilization of human and financial resources in countries. Recent experiences in Chile and Peru reveal an estimated cost of US $12,400 and $40,000, respectively (as reported by countries), to contain the outbreak. No secondary case was reported in either country.

The private sector plays a key role in the detection and rapid response to outbreaks. In the period 2008-2009, 62% of measles reported in Latin America and the Caribbean were detected in the private sector. Therefore, private-sector participation in surveillance activities should be strengthened by establishing partnerships with medical associations and scientific societies. Partnerships should also be considered with tourism boards since the virus is usually imported by tourists or visitors to the Region.

Given the tremendous investment that countries are making to contain outbreaks, measles elimination efforts in other regions of the world should be intensified. Such an initiative would be a step toward global measles eradication. The World Health Organization (WHO) will conduct a measles elimination feasibility study, whose final report will be submitted to the WHO Executive Board in 2010.

April 2009, Volume XXXI, Number 2

Rubella Watch

Panel of Experts for the Documentation and Verification of Measles, Rubella, and CRS Elimination

In 2002, the Americas interrupted the transmission of endemic measles virus. In 2003, the Region set the goal of rubella and congenital rubella syndrome (CRS) elimination by 2010. In October 2007, the 27th Pan American Sanitary Conference approved Resolution CS27.R2 calling for the formation of an international committee responsible for documenting and verifying the interruption of endemic measles and rubella virus transmission in the Region of the Americas. The Resolution also urged Member States of the Pan American Health Organization (PAHO/WHO) to establish national commissions to compile and analyze data to document and verify measles, rubella, and CRS elimination, for review by the international committee.

In this context PAHO/WHO’s Comprehensive Family Immunization Project gathered a Panel of Measles, Rubella, and CRS Experts that met in Washington, D.C., from 27-29 August 2008. The main objective of the meeting was to discuss the essential elements, including indicators, to be incorporated into the Plan of Action for documenting and verifying measles, rubella, and CRS elimination in the Americas. Experts and health authorities from Argentina, Brazil, Canada, Colombia, Chile, the English-speaking Caribbean, Guatemala, Mexico, Peru, and the United States, PAHO/WHO immunization staff and consultants, and World Health Organization staff were in attendance.

Experts congratulated PAHO/WHO Member States for their progress towards eliminating rubella and CRS, bringing the Region closer to the process for documenting and verifying the elimination of these diseases. They highlighted the importance of taking into account the lessons learned from the global eradication of smallpox and the regional eradication of polio to gain an understanding of the main requirements of the elimination process. Among the lessons learned are the following:

1. Reliance on scientific evidence to guide the documentation process, for example as it pertains to the time between the last known case and certification, i.e., 2 and 3 years for smallpox and polio, respectively.
2. Required sensitivity of surveillance.
3. Proficiency and diligence with which the national commission examines national data. In addition, provide concise roles of both national commissions and the international committee; and
4. Consider the regional elimination process in a global context.

The table on page 47 lists the experts’ conclusions and recommendations.

### Reasons for vaccination in borders areas

- In order to achieve rubella and congenital rubella syndrome elimination and maintain measles elimination in the Americas, the identification of groups that for socio-cultural reasons and access problems have a greater probability of being excluded from regular vaccination is crucial.
- Since border populations move from country to country, due to involvement in productive processes, agriculture, tourism, and others, they have a greater probability of exclusion by remaining in neighboring countries during adolescence and adult vaccination campaigns. Up-to-date campaigns conducted in their native countries. Furthermore, adult measles-rubella vaccine (MRV) is not included in routine immunization programs.
- The exclusion of border populations can lead to pockets of measles and rubella susceptible groups. Since these populations move from country to country, they have the potential to expose the Western hemisphere to a greater risk of outbreaks in countries secondary to importations, thus threatening the achievements gained to date in measles and rubella elimination.
- The implementation of an integrated vaccination strategy in border areas during the 2008 mass vaccination campaigns in Argentina and Brazil offered a valuable opportunity to reach these vulnerable populations. This led to the development of a differentiated vaccination strategy that can be used in other regions with elimination goals.
- Finally, the health improvements among border populations through vaccination and other health services that are customarily integrated with these activities (for example, vitamin A supplementation) contributes to reducing health inequities in the Region.

### Table 1. Imported Measles Cases, the Americas, 2008

<table>
<thead>
<tr>
<th>Country</th>
<th>Total Importations</th>
<th>Total Cases Associated With Importation</th>
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<tbody>
<tr>
<td>Ecuador</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Jamaica</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Peru</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>United States</td>
<td>24</td>
<td>102</td>
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<tr>
<td>United States</td>
<td>22</td>
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<tr>
<th>Country</th>
<th>Total Importations</th>
<th>Total Cases Associated With Importation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina</td>
<td>1</td>
<td>United Kingdom</td>
</tr>
<tr>
<td>Canada</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Chile</td>
<td>0</td>
<td>United States</td>
</tr>
<tr>
<td>United States</td>
<td>22</td>
<td>Cape Verde, China, Italy, United Kingdom</td>
</tr>
</tbody>
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### References


### Table 2. Imported Measles Cases, the Americas, 2009

<table>
<thead>
<tr>
<th>Country</th>
<th>Total Importations</th>
<th>Total Cases Associated With Importation</th>
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<tbody>
<tr>
<td>Argentina</td>
<td>0</td>
<td>United Kingdom</td>
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<td>Canada</td>
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<tr>
<td>Chile</td>
<td>0</td>
<td>United States</td>
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<tr>
<td>United States</td>
<td>0</td>
<td>Cape Verde, China, Italy, United Kingdom</td>
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<table>
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<tr>
<th>Source</th>
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</thead>
<tbody>
<tr>
<td>France, India, Israel, Morocco, Pakistan and Switzerland</td>
</tr>
<tr>
<td>Belgium, China, Germany, India, Italy, Brazil, Switzerland, United Kingdom, Vietnam</td>
</tr>
</tbody>
</table>

2. In 2008, the United States reported 14 cases whose source of infection was unknown.

Participants from the Panel of Experts on the documentation and verification of measles, rubella, and CRS elimination. Washington, DC, August 2008.
April 2009, Volume XXXI, Number 2

Eliminating Rubella and Congenital Rubella Syndrome in the Americas: An Achievable Dream

Rubella elimination in the Americas has been defined as the interruption of endemic rubella transmission and the absence of congenital rubella syndrome (CRS) cases associated with endemic transmission in all the countries over a period of 12 months or more. With the implementation of the elimination strategies recommended by the Pan American Health Organization/World Health Organization (PAHO/WHO), around 440 million people—children, adolescents, and adults—have been vaccinated for the most part with measles-rubella (MR) vaccine in the catch-up (140 million), follow-up (50 million), and speed-up (250 million) campaigns conducted by the countries of the Region from 1998 to 2008, while maintaining routine vaccination (Figure 1). The last countries to conduct and/or conclude their mass rubella vaccination campaigns in 2008 were Brazil, Haiti, and Argentina. With its “Rubella-free Brazil” campaign, the country managed to organize around 67 million people aged 20-19 years (95% coverage) and young people aged 12-19 years in five states: Maranhão, Minas Gerais, Mato Grosso, Rio de Janeiro, and Rio Grande do Norte. Despite many setbacks, Haiti completed its national campaign against rubella, measles, and CRS in the age group 1-19 years, achieving 98% administrative coverage and 94% coverage verified through rapid coverage monitoring (RCM). Due to the successful progress in coverage results, the country has initiated a national survey in June to ensure coverage homogeneity and identify potential areas and/or groups that have not been vaccinated. Argentina achieved 90% coverage by late December 2008 with its campaign “If you’re a man, get vaccinated,” targeting men aged 16-39 years only. In 2009, the country had vaccinated women aged 15-19 years only, achieving 99% coverage. In June 2009, Argentina launched a supplemental vaccination campaign targeting men in order to obtain a minimum of 95% coverage in all its provinces. The Region of the Americas has made extraordinary progress towards eliminating rubella and CRS. It has limited endemic virus circulation to Argentina, a country that reported three rubella cases as of epidemiological week 4 of 2009, in Chuaco Province, and two CRS cases (Figure 1). With the intensification of supplemental vaccination and surveillance activities, it is anticipated that it will finally be possible to interrupt endemic circulation in the Hemisphere. However, it is still important that countries do not let their guard down. Maintaining measles, rubella, and CRS elimination implies many challenges for the Region, among them:

- the risk of virus importations from other regions of the world;
- the emergence of cases secondary to importation;
- outbreaks of imported and rapid response;
- reach “the unreached” by providing a second opportunity to receive the MR vaccine through high-quality follow-up campaigns;
- strengthened the integrated surveillance system and active private-sector participation;
- monitor viral excretion in CRS cases; and
- false positive/negative results of cases and limited specimens for virus detection/isolation.

Overview of Challenges

Circulation of the measles and rubella viruses in other regions of the world can reach the Americas at constant risk of importation. According to the World Tourism Organization, over 148 million tourists visited the Region in 2008, say with 98.5 million, 21 million, and 20 million visits to North America, South America, and the Caribbean, respectively. Importation cases are unavoidable. Therefore, countries must be adequately prepared and have a high-quality surveillance system in place to identify such cases. They must maintain high levels of population coverage and conduct adequate monitoring of susceptibles to limit the number of secondary cases. Once the window of outbreak preparation is closed by developing a national rapid response plan.

Complacency about the success achieved can contribute to the reestablishment of endemic circulation of the measles virus, primarily because of low coverage obtained by the routine program and follow-up campaigns. Low coverage in the routine program could trigger outbreaks, with a potential risk of devastating rubella outbreaks.

Furthermore, despite country efforts to achieve high vaccination coverage in the routine program and follow-up campaigns, pockets of measles and rubella susceptibles still persist. It is therefore essential to guarantee high-quality follow-up campaigns every four or five years and achieve coverage >95%. Excluded populations, i.e., people who have never been vaccinated for various reasons, should be targeted, in an effort to promote equity. A thorough analysis of protected cohorts should be conducted to identify the population groups to vaccinate.

Rapid Coverage Monitoring (RCM) remains an integral element of supplemental vaccination activities and should be conducted at the end of follow up campaigns. RCM can confirm whether two doses of measles-mumps-rubella
It is also imperative to monitor excretion of the virus in CRS cases. In 2008–2009, the Americas reported a total of 37 cases in Argentina (n=3), Brazil (n=31), Chile (n=2) and the United States (n=1). The rubella virus can be excreted for 12 months; thus, in all CRS and congenital infection cases, a specimen should be collected for viral detection after 3 months of age. If the result is negative, a second specimen should be collected after 30 days. If the second specimen is negative, it can be established with certainty that the case has stopped excreting the virus.

One of the major challenges to the measles/rubella laboratory network is the handling of sporadic cases with positive or inconclusive results, particularly suspected cases with no history of travel, epidemiological link, or vaccination history. As diseases become less common due to high vaccination coverage, the positive predictive value of laboratory tests declines, giving rise to a higher number of false positives.

Finally, viral surveillance needs to be improved. Very few specimens are currently processed for viral detection/isolation and molecular typing. These laboratory results would help determine the source of infection in imported cases and viral genotypes, particularly for the rubella virus. In the final stretch of the rubella elimination initiative, molecular epidemiological data will help with classifying cases and documenting the elimination of endemic transmission.

The Way Forward
In October 2007, the 27th Pan American Sanitary Conference noted with great satisfaction the tremendous progress achieved towards the interruption of endemic rubella transmission and recognizing the invaluable efforts to strengthen and expand public-private partnerships, adopted Resolution CSP27.R2 urging Member States to begin documenting and verifying the interruption of endemic transmission of the measles and rubella viruses in the Americas.

To this end, PAHO/WHO developed a Plan of Action with the following six basic components:
1) epidemiological analysis of measles, rubella, and CRS; 2) quality of measles, rubella and CRS surveillance; 3) analysis of the molecular epidemiology of detected/isolated measles and rubella viruses; 4) analysis of vaccinated population cohorts, which includes routine vaccination coverage, follow-up campaigns, and adolescent and adult vaccination campaigns, and post-partum vaccination; 5) sustainability of the National Immunization Program; and 6) linking the evidence for elimination.

Consideration has been given to implementing the documentation and verification process over a three-year period in the presence of high-quality surveillance.

The plan will be submitted to the XVIII meeting of the Technical Advisory Group (TAG) on Vaccine-preventable diseases for recommendations. The plan will guide countries and their national commissions as they prepare and consolidate evidence that endemic measles and rubella transmission has been interrupted, using complete, consistent, valid, and representative data.

PAHO seeks partnerships with member governments, private groups and other organizations to address major public health issues. In addition to its core budget financed by quota contributions from Member States, PAHO also seeks outside funding to help implement programs and activities that advance key public health goals and respond to special needs. Voluntary tax deductible contributions for PAHO health and education projects in the Americas may be made to the Pan American Health and Education Foundation (PAHEF) PAHO’s private philanthropic partner.