

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. New Providence and Grand Bahama account for 68% of the total population in the Bahamas. The objectives of the campaign was to keep the country free of measles, 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 Island receives over one million tourists every year. In July of 1998, the Ministry of Health of the Bahamas requested that PAHO/SVI carry 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 complications due to CRS within three, five and 15 months of their birth. A large pool of susceptible individuals that could potentially contract rubella was expected, since there had never been a vaccination program targeting adults. In April 1997, the Bahamas also reported its first laboratory confirmed measles case in seven years due to an importation.

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 MMR campaign targeted the population (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. Estimated target population for the MMR campaign was initially 180,980 (1995 midyear projection), but 27,800 showed adequate vaccination prior to the campaign, and the number was adjusted to 153,180. Approximately, 80% of the target population or 122,844 are in the work force, and 30,296 (20%) are in the age group 4 to 14 years.

The campaign was carried out in four phases: Phase I: targeted postnatal mothers; Phase II: targeted young adults 17 to 18 years of age, who were graduating from high school in June, 1997; Phase III: targeted work-sites (40% of the target population); and Phase IV: targeted school-aged children (5 to 16 years of age.) MMR vaccine from two laboratories were used, a total of 5000 single-dose vials from a laboratory producing an MMR strain containing the Jeryl

Lynn mumps strain, and the remaining doses in ten-dose vials were supplied from another laboratory containing the Leningrad-Zagreb mumps strain.

Safe Syringe Practices

Single use disposable syringes and biohazards containers were supplied to clinics and vaccination teams. Some of the family islands used large plastic bottles found at clinics. An information sheet was provided to health workers addressing safe syringe practices. On the islands of Grand Bahama and New Providence, where incineration facilities exist, all used sharps were disposed using this method. On islands with no incineration facilities used syringes and needles were disposed of by burning or burying.

A post-campaign survey confirmed that 97% of all health workers had not re-capped used sharps and 100 % of all health care workers responded that they had not heard or seen any accidental needle sticks. Results for the supervisors were the same.

Vaccination Coverage

Coverage attained in the MMR campaign for the target population of 153,180 was 67.4% (103,170). Analysis of survey data from the capital city of New Providence, Nassau, indicate that 26% of the population in the age group 25-40 remain unvaccinated (Table 1).

Table 1
Vaccination Coverage of the Bahamas MMR Campaign

Age Group	Population Targeted ⁱ	Population Vaccinated	% Coverage
4 - 14 years	30,296	29,218	96%
15 - 24 years	50,084	31,127	62%
25 - 40 years	72,800	42,825	59%
TOTAL	153,180	103,170	67%

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

Surveillance of Adverse Reactions

Given the scope of the campaign and the inclusion of MMR vaccine in adults for the first time in the Americas, special training was given to health workers to strengthen surveillance activities for adverse reactions. Information coming from previous MMR vaccination campaigns of children 0-14 years of age in countries outside the region had reported an increased rate of aseptic meningitis in children receiving MMR vaccine containing the Urabe mumps strain. PAHO's evaluation of the campaign sought to document the experience of MMR vaccination in mass campaigns, particularly in adults, to address the issue of adverse reactions and provide clear technical guidelines for other countries.

A total of 212 adverse reactions were reported to the Ministry of Health after receiving a dose of MMR vaccine (Table 2). Approximately 62 % of the cases were females;

with a male to female ratio of 1:1.65. The most common events reported were: parotitis, n =123, with a rate of 120 reports per 100,000 persons immunized, followed by rash and itching, n = 41. Most cases of parotitis (80%) were in adults. No cases of anaphylactic reaction were reported. There were five cases presenting an allergic reaction that needed hospitalization, one of these requiring overnight stay. Only one case of aseptic meningitis was reported, giving a rate of 0.96 per 100,000 vaccinated persons. This case was transitory--temporary condition with no sequelae.

Vaccination during Pregnancies

The surveillance system put in place for monitoring adverse reactions identified 33 women who had been accidentally vaccinated during the first trimester of their pregnancy in the Grand Bahama. Of these women, 15 met the criteria of having a specific date written in their maternal records or a vaccination card for having received a dose of MMR vaccine. All 33 delivered normal, healthy newborns. Hospital dockets from Princess Margaret Hospital in Nassau also confirmed that seven women who had been accidentally vaccinated in the first trimester gave birth to normal, healthy babies.

Table 2
Frequency Distribution of Adverse Events during MMR Campaign, Bahamas, 1997

Types of Adverse Events	Frequency of Adverse Events	Rate Per/100,000 Vaccines	Average Time between vaccination and Event (Days)
Parotitis	123	120	14
Rash/Itching	41	40	6
Fever	28	27	13
Headaches	25	24	6
Respiratory/Symptoms	19	19	10
Fever/Rash	15	15	5
Malaise/Myalgia	15	15	6
G.I. Symptoms	11	11	1
Arthralgia/Arthritis	9	9	4
Orchitis	3	3	17
Aseptic meningitis	1	.96	29

Source: SVI Evaluation Report, July 1998. For a complete copy of the evaluation, please contact the Ministry of Health in the Bahamas, or the Special Program for Vaccines and Immunization in Washington D.C., USA.

Update: Measles in the Americas

For the first six weeks of 1999, there have been 114 confirmed measles cases reported from seven countries (Argentina, Bolivia, Chile, Colombia, Dominican Republic, Uruguay and the United States) in the Region (Figure). Up to February 13, the Dominican Republic has reported 34% of all cases to date. This outbreak was detected in mid-December 1998, but the first cases appeared to have occurred early November 1998. Investigation of the outbreak is underway, to determine possible sources of infection. The preliminary investigation of this outbreak indicates that the majority of the 39 confirmed cases occurred in non-vaccinated individuals that were eligible for vaccination. Therefore, these cases were preventable. The last laboratory-confirmed case of measles in the Dominican Republic occurred in 1997 in a tourist.

Bolivia's year end data show a total of 985 confirmed cases for 1998. Up to February 13, 1999, a total of 122 confirmed cases have been reported, of which the majority of cases are found in the Departments of Cochabamba and Santa Cruz. Investigation of the outbreak in Cochabamba (1998-99) shows that 85% of all confirmed cases are in

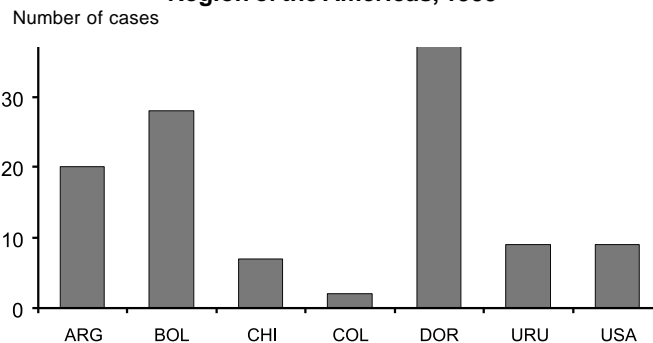
children under five years of age (n=156) who were not vaccinated during the *follow-up* campaign held in 1998. Vaccination efforts have been slow in this department, especially in the large urban areas of the city of Cochabamba.

As a result the Ministry of Health is conducting an aggressive *mop-up* effort, in order to reduce the number of susceptibles to measles.

All countries in the Region must monitor the build-up of susceptibles as a result of either low vaccination coverage in routine programs or a less than adequate coverage in *follow-up* campaigns. In addition, maintaining a sensitive surveillance system and implementing aggressive case investigations of all suspected measles cases is critical if a country is to con-

front possible importations of measles from neighboring countries or from other regions of the world where the disease circulates widely. These steps should prevent the re-establishment of measles virus circulation in the Region. In Bolivia, the first cases of confirmed measles were due to importations from a neighboring country with a measles outbreak, and in the Dominican Republic measles importation is also strongly suspected.

Figure
Countries reporting confirmed measles cases Region of the Americas, 1999*



* Data as of 13 February
Source: Measles Eradication Surveillance System/PAHO