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Seasonal Influenza Vaccination Campaign in Guyana

Background

Guyana launched an influenza vaccination campaign from 18 June to 30 July 2009. The Pan American Health Organization (PAHO) facilitated the donation of 30,000 doses of seasonal influenza vaccine to the country. The vaccine arrived in Guyana on 15 June 2009. There were 5,000 pediatric and 25,000 adult doses of the Northern Hemisphere formulation, with an expiry date of 31 July 2009. The main goals of Guyana's vaccination campaign were to reduce morbidity and mortality due to seasonal influenza and to learn lessons for potential mass vaccination against influenza A(H1N1). This report describes various aspects of the influenza vaccination campaign.

Preparation Before Arrival of the Vaccine

1. **Identification of high-risk individuals:** After reviewing the guidelines from the World Health Organization (WHO) and the US Centers Disease Control and Prevention (CDC), Guyana decided that the following groups will be given priority for getting vaccinated considering limited stock of the vaccines:
 - High-risk individuals: Healthcare workers, children aged 6 months to 5 years, and any individuals with co-morbidities such as lung disease, heart disease, and diabetes.
 - Individuals involved in critical public service activities, such as police and defense forces.

The Maternal and Child Health Department (MCH) determined a target population of 29,804 after identifying high-risk individuals by contacting all public and private hospitals, regions, homes for the elderly, orphanages, defense and police forces.

2. **Human resources:** The director of the MCH Department identified 15 final-year nursing students who would work under direct supervision of regular nursing staff to assist with vaccination activities. A fact sheet was prepared to educate vaccinators as this was the first time influenza vaccine was made available in Guyana.
3. **Documentation and data collection:** A new family immunization register was designed for better record-keeping.
4. **Registration of vaccines:** The MCH Department contacted drug regulatory authorities to obtain approval for using influenza vaccines in Guyana since the vaccine was being used for the first time.

5. **Cold chain capacity:** Cold chain capacity was assessed and was found to be adequate. The new national cold storage facility was used to store all the vaccines.

Campaign Implementation

The campaign was launched on 18 June 2009.

1. **Storage and distribution:** The vaccines were stored at the National Cold Storage facility located in Georgetown. The MCH Department designed a distribution plan to ensure vaccine availability in all regions of Guyana. Regional healthcare workers obtained vaccines in multiple batches during their weekly visits to Georgetown.



Dr. Leslie Ramsammy, Minister of Health, Guyana, getting vaccinated against seasonal influenza on the first day of the campaign.

National Campaign to Eliminate Rubella and Strengthen Measles Elimination in Haiti

Haiti introduced the monovalent measles vaccine into the routine program in 1984 with a single-dose schedule in children aged 9 months. Between 1990 and 2007, yearly immunization coverage with measles vaccine ranged from 24-54%, reaching the highest coverage of 85% in 1999.

Haiti is the only country of 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 estimates of incidence showed that new CRS cases in the country were between 1.63 and 4.40 per 100,000 live births per year. Furthermore improved surveillance and laboratory diagnosis led to the laboratory confirmation of 11 rubella cases in the country in 2006.

A seroprevalence study conducted among 503 pregnant women in 2002 showed that 95% of women aged >20 years had acquired natural immunity to rubella infection.⁽¹⁾ In 2007, the 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 Resolution of the Pan American Health Organization (PAHO), Haiti joined the rest of PAHO Member States in adopting the goal of rubella and CRS elimination by 2010. The campaign was integrated with a package of services to improve the health of Haiti's popula-

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2. **Outreach:** Outreach visits were made to vaccinate high-risk groups. Healthcare workers visited homes for the elderly, orphanages, defense force facilities, police stations, prisons, and hospitals over the course of campaign.
3. **Collaboration with other departments and agencies:** The MCH Department together with the PAHO/WHO Representation in Guyana successfully collaborated with key governmental and private agencies; this included defense forces, police forces, Social Service Department, blood bank, and private healthcare facilities. A list of all homes for the elderly was obtained from the Social Service Department.
4. **Monitoring and surveillance:** Weekly, regional healthcare workers reported the number of persons vaccinated in their respective regions. The MCH Department and the PAHO team reviewed the weekly reports to guide further action. The report of Events Supposedly Attributable to Vaccination or Immunization (ESAVIs) was emphasized during the initial briefings so that all reportable events are appropriately recorded. Only one vaccine-related adverse event was reported during the campaign.
5. **Description of vaccine recipients:** Out of a total of 29,253 vaccine recipients, 4,675 (16%) were from the hinterland areas. Region 4, the most populous region, had the highest number of vaccine recipients (9,668, 33%). Another 2,847 individuals were vaccinated in retirements homes, orphanages, and among other high-risk groups.

Table 1 includes count of total number of individuals vaccinated during outreach activities in

Table 1. Vaccinated Individuals During Outreach Activities, Guyana, 2009

Location	Number of Individuals Vaccinated
Regions	24,293
Private hospitals and Armed Forces	2,113
Homes for the elderly and work places	2,847
Total	29,253

the Georgetown area, in addition to the persons vaccinated in all the regions. 4,960 (17%) individuals were vaccinated during outreach visits to the healthcare facilities, homes for the elderly, orphanages, police stations, and defense forces establishments in Georgetown area.

Lessons Learned

Following are some of the most important lessons learned during the mass vaccination campaign in Guyana:

Monitoring: Weekly monitoring meetings, which included a review of the number of vaccinated individuals in each region, helped the MCH Department and PAHO to immediately identify problems and make necessary changes to existing strategy during the campaign. The leadership set specific, measurable targets for health workers. This was very helpful to ensure efficient implementation and weekly monitoring during this campaign.

Surge capacity: Nursing and medical students can play a vital role by fulfilling the need for extra manpower. The students can assist in vaccination campaigns and can be useful in dealing with public health emergencies.

Evaluation: Evaluation should be part of the initial planning process. Data variables needed for evaluation should be identified and communicated to health workers prior to the beginning of the campaign.

Targeting high-risk groups: Policy should be developed and implemented to ensure that high-risk age groups get priority for receiving vaccines. Also, a well-crafted communication strategy should be developed to minimize misunderstanding and frustration among low-risk individuals who might not be able to get vaccinated.

Conclusions

Overall, the influenza vaccination campaign was successful in Guyana, as the country was capable of conducting mass vaccination campaigns and immunizing large number of individuals in a short time period. The MCH Department was able to develop the surge capacity, and collaborate with relevant partners. The lessons learned should greatly help national authorities with improving the planning and implementation of future mass vaccination campaigns. ■

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tion. In addition, rubella-containing vaccine was gradually introduced into the routine program following campaign implementation as per the PAHO-recommended strategy.

The national campaign to eliminate rubella utilized a “rolling campaign” strategy. Given the shortage of national supervisory staff and community health workers, the strategy was selected by the MSPP to ensure the completion of high-quality vaccination interventions in one department prior to moving to the next. The campaign targeted the group aged 1-19 years, which included 1,041,384 children aged 1-4 years and 3,502,836 children and adolescents aged 5-19 years (total = 4,544,220). Furthermore, corresponding target populations for preventative, integrated interventions were as follows: oral polio vaccine, 1,325,397 children aged <5 years; diph-

theria and tetanus toxoid vaccine (Td), 705,819 women of childbearing age (aged 15-49 years); vitamin A supplementation, 1,041,384 children aged 1-4 years; and albendazole, 2,970,038 nursery and primary school students.

The decision to conduct a national rubella vaccination campaign positioned Haiti as one of the final countries of the Region to implement interventions to eliminate rubella and CRS and maintain measles elimination.

Campaign Objectives

Haiti undertook the most ambitious vaccination campaign in its history, targeting more than 4.5 million children, adolescents, and young adults aged 1-19 years as well as women of childbearing age in urban areas, representing 50% of the country's population.

The main objectives of the campaign were to strengthen measles elimination and reduce the risk of importations to the country, and to take the first steps towards rubella and CRS elimination.

The secondary objectives as outlined by the national plan for the vaccination campaign were to reinforce polio immunization to prevent the reintroduction of the disease or vaccine-derived poliovirus; serve as a catalyst for the elimination of neonatal tetanus; and fight vitamin A deficiencies in children <5 years as well as intestinal parasites in schoolchildren.

Several factors were considered to justify the campaign, including low measles vaccination coverage (57%-66% between 2004 and 2006¹)

1 Coverage reports for measles vaccine in children <1 year of age.

and the accumulation of susceptibles, the continuous risk of importations due to the transient nature of the Haitian population and foreign visitors to the country, and a week febrile rash illness surveillance system.

Campaign Implementation

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

- Obtaining 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 input costs;
- Implementing a pilot campaign to prepare for the national integrated campaign and generate important lessons to improve existing vaccination strategies;
- Providing extensive training for health workers and adapting training and instructional materials to provide consistency in campaign implementation methodology in a culturally appropriate and simple manner;
- Conducting micro-planning activities at the local level to ensure that hard-to-reach areas and vulnerable populations are reached with campaign activities in an organized manner;
- Ensuring periodic supervisory meetings to make necessary adjustments before and during the campaign to ensure attainment of the campaign goal;
- Providing an integrated package of services to capitalize on vaccination opportunities to reach more than half of the country's population with preventative interventions; and
- Recruiting volunteers from various organizations to overcome human resource shortages.

The pilot campaign was conducted in May-June 2007 and the launching event corresponded with Vaccination Week in the Americas. The "rolling" campaign strategy was implemented in different phases, targeting blocks of departments (strata) in order to cover the entire country (Metropolitan area, 10 departments, and 133 municipalities). Strategies selected for service delivery included the vaccination of captive populations (in schools, institutions, businesses, and health establishments), vaccination in fixed posts, and door-to-door vaccination.

Figure 1. National Campaign to Eliminate Rubella: Strategy of Campaign in Stages, Haiti, 2007-2008

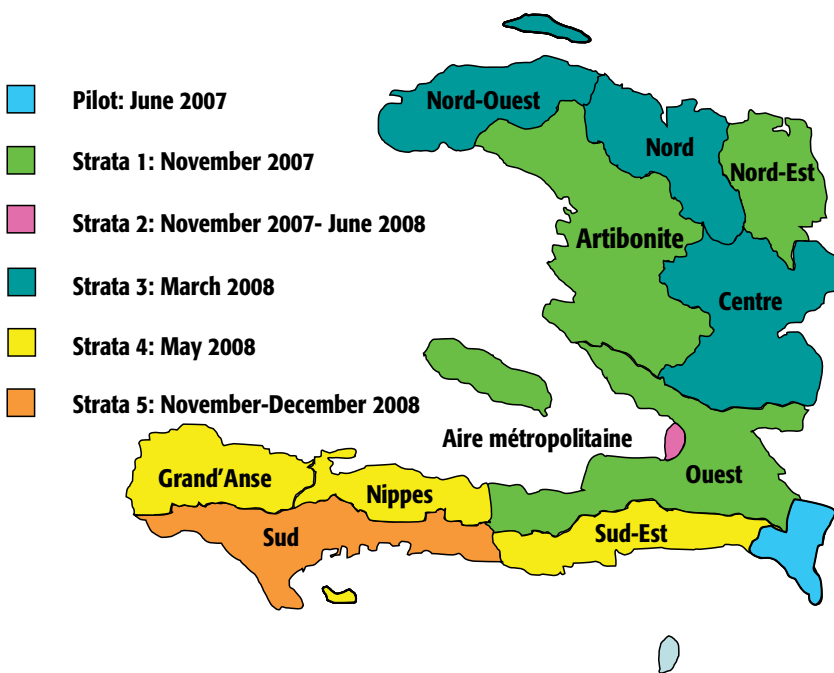
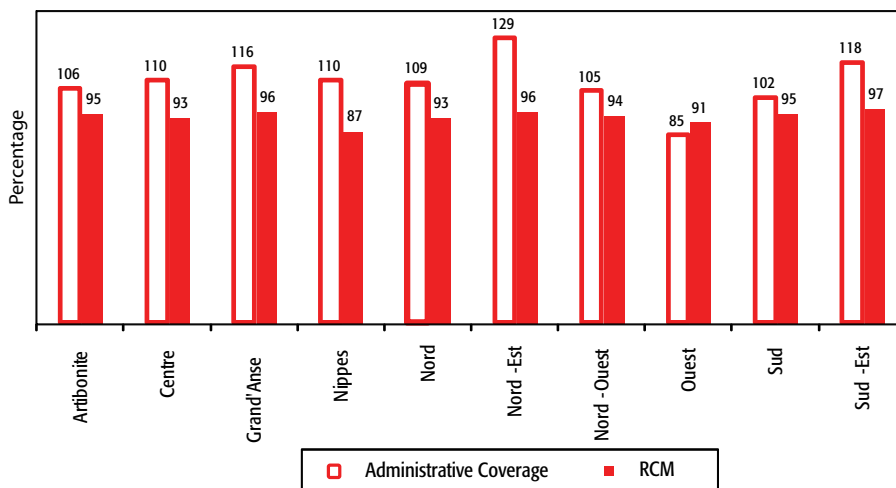


Figure 2. Administrative Coverage* and % Vaccinated as per Rapid Coverage Monitoring (RCM), Haiti 2007-2008



* Data for the denominator provided by the Ministry of Public Health and Population, Haiti. Note: No RCM were conducted in Aire métropolitaine; the administrative coverage obtained there was 96%.

Under the Creole slogan, *Ann Al Vaksinen* ("Get Vaccinated"), the national campaign was launched on 5 November 2007 and initial vaccination activities were concentrated in the first strata (Artibonite, Nord-Est, and Ouest Departments). Later that month activities targeted the second strata (Aire métropolitaine), and, in March 2008, activities continued in the third strata (Nord-Ouest, Nord, and Centre Departments).

Campaign activities were conducted in the fourth strata (Grand'Anse, Nippes, and Sud-Est Departments) and the fifth strata (Sud Department) in May and November 2008, respectively (Figure 1). Several challenges were confronted and resolved over the course of the campaign planning, execution, and evaluation phases, including initial concerns and insufficient prolonged commitment of the MSPP based on the assump-

tion that campaign activities would detract from the routine EPI program; operational constraints which required continuous resource mobilization efforts; shortage of qualified national staff to conduct supervisory activities and lack of motivated local level 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.

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 suggested by rapid coverage monitoring (RCM). The success of the pilot clearly demonstrated the demand for vaccination and other health interventions by a target population that is not generally the recipient of immunization activities. It also allowed the country to advance in the organization and planning process for the nationwide campaign.

The "rolling" campaign, which concluded in November 2008, one year after its launch, did not advance as quickly as initially planned due to several unforeseen events such as food shortages and the postponement of activities due to end-of-school-year exams. Despite these setbacks, the campaign achieved 103% administrative coverage (80% coverage in population aged 1-4 years and 110% coverage in population aged 5-19 years) with MR-containing vaccine by vaccinating a total of 4,676,353 people. The coverage by department ranged from 85% (Ouest) to 129% (Nord-Est); nine of the departments and the Aire métropolitaine achieved greater than 95% administrative coverage (Ouest Depart-

ment reached 85% coverage). At the municipality level, 77% (n=102) reported $\geq 95\%$ coverage and 92% (n=122) reported 80% coverage.

RCM was implemented during and following campaign implementation to provide health workers and supervisors with a quick impression of the completeness of vaccination and ensure that homogenous high coverage was attained, even in the poorest performing municipalities. As suggested by RCM, campaign coverage reached 93% at the national level: 91% in the group aged 1-4 years and 95% in the group aged 5-19 years. The discrepancies between administrative coverage and RCM assessments (Figure 2) may be explained by incomplete tallying or reporting of the number of doses administered and outdated census data, as well as the vaccination of individuals outside of the targeted age group.

The campaign was successful thanks to the collaborative efforts of around 20,000 health workers (comprising over 4,400 vaccination teams; national, departmental, and local supervisors; institution heads; and campaign coordinators) and over 18,000 volunteers. Services were delivered in over 10,000 immunization posts, of which more than 5,000 were located in hard-to-reach areas.

Administrative coverage for the integrated preventative interventions was 76% for oral polio vaccine, 78% for Td vaccine, and 53% coverage with albendazole treatment.

The total cost of the national vaccination campaign was US \$9.5 million, which included a package of interventions integrated with measles-rubella vaccination. This equals around US \$2.00 per person. More than US \$6 million of the budget was for procurement of the MR-containing vaccine and the remainder was related to operational costs. Strategic partners, including PAHO/WHO, UNICEF, various agencies of the

United Nations System, and non-governmental organizations provided invaluable support to overcome budget shortfalls.

Final Considerations

The success of the national campaign to eliminate rubella and CRS in Haiti marks the final chapter of the implementation of interventions to achieve rubella elimination in the Region of the Americas. In order to verify this achievement and the attainment of high homogeneous coverage, the implementation of a national coverage survey began in April 2009. In addition to advancing towards rubella elimination and maintaining measles elimination, the integrated campaign promoted a culture of prevention by reaching more than half of the population with preventative health services.

Haiti's campaign has also strengthened routine immunization by training personnel on safe injection practices, waste management, cold chain, and monitoring of events supposedly attributable to vaccination or immunization (ESA-VIs); by exploring innovative social mobilization strategies to engage adolescent and young adult populations that will be useful as new vaccines are introduced; by utilizing micro-planning activities to revitalize routine outreach to vulnerable populations; and by recognizing and overcoming threats to the cold chain that will ensure the quality and safety of future vaccines delivered through the routine program. ■

Reference:

1. Desinor OY, Anselme RIP, Laender F, Saint-Louis C, Bien-Aime JE. Seroprevalence of antibodies against rubella virus in pregnant women in Haiti. *Rev Panam Salud Publica*. 2004;15(3):147-50.

Suspect Rubella Cases with Positive Laboratory Results, Guatemala, 2008

In 2008, eight of the 313 cases reported to the measles/rubella surveillance system in Guatemala tested rubella IgM positive. These cases were located in five Health Areas: Guatemala Central, Guatemala Nororiental, Escuintla, El Quiché, and Petén Sur Oriente. To classify the cases, thorough investigation was conducted, including home visit, follow-up of contacts, vaccination coverage analysis of the area, and active case searches in health centers and in the community.

The objectives of this article is to describe the clinical and epidemiological characteristics of the suspect cases that tested IgM positive and the active search activities conducted, to evaluate the follow-up activities included in the national protocols for the management of measles/rubella suspect cases and their implementation in these cases, to evaluate the sensitivity of the surveillance system to detect suspect measles and rubella cases in the affected Health Areas, and

to compare the results obtained in Guatemala's National Health Laboratory with the results obtained at the Reference Laboratory in Panama (*Laboratorio Conmemorativo Gorgas*).

Methods

Review of all the data available, including household interviews, clinical evaluation, laboratory results, vaccination coverage analysis in the affected Health Areas, revision of diagnosis in clinical logs in Escuintla and Petén Sur Oriente, and interviews with community leaders, school masters, daycare centers, church leaders, and non-governmental organizations.

Table 1. Suspect Rubella Cases Entered in the Epidemiological Surveillance System With Positive Laboratory Results, Guatemala, 2008

Case	Health Area	Age	Vaccine Doses	Date of Last Dose	Rash Onset Date	Date of Blood Collection and IgM Result				Measles IgM Result	Rubella IgG Result	Dengue IgM Result	Final Diagnosis
						1st		2nd					
1*	Escuintla	15 yrs	2	NA	3 March 08	7 March 08	positive			negative	positive		varicella
2*	Escuintla	12 yrs	1	16 April 07	25 March 08	28 March 08	positive	15 April 08	positive	negative	positive	negative	unknown
3*	Escuintla	9 yrs	2	22 May 00	9 June 08	12 June 08	positive			negative	positive	positive	dengue
4	Guatemala/Centro	1 yr	1	10 July 08	4 September 08	8 September 08	positive			equivocal	positive		unknown
5	Quiché	2 yrs	1	2 April 08	13 August 08	18 August 08	positive			negative	positive		varicella
6	Quiché	1 yr	2	19 August 08	22 September 08	23 September 08	positive			negative	positive	negative	unknown
7	Petén	31 yrs	1	15 March 07	21 September 08	20 September 08	positive	29 September 08	positive	negative	positive	negative	unknown
8	Guatemala/Nororiental	13 yrs	1	1 August 07	17 October 08	28 October 08	positive			negative	positive	positive	dengue

*Also tested IgM positive in the Reference Laboratory in Panama.

■ No test done

Results

Five of the country's 29 Health Areas reported eight cases with positive laboratory results (IgG and IgM) for rubella. Specimens from three of the eight cases were tested at the Reference Laboratory in Panama and produced the same results. The clinical characteristics of all eight cases were not compatible with rubella; two cases had clinical evidence of varicella. All eight cases reported having received at least one measles-rubella containing vaccine, seven of them presented written proof of vaccination: four had received 1 dose and three received 2 doses. Two cases tested positive for dengue IgM. No other cases were identified in the communities where the cases lived and/or worked or studied. During the active case searches conducted in Escuintla and Petén Sur Oriente, 24,207 diagnoses were reviewed and 60 (0.25%) of them met the case definition. Forty-seven of the 60 cases (78.3%) had been detected by the surveillance system: 42 of the 55 (76.4%) suspect cases in Escuintla and all 5 cases in Petén Sur Oriente. After the investigation, all cases were discarded. Two cases were diagnosed as varicella, two as dengue, and the diagnosis could not be defined in four (Table 1).

Conclusions

The last measles case reported in Guatemala occurred in 1998. The last rubella case occurred in epidemiological week 30, 2006, before the end of the 2006 mass nationwide vaccination campaign targeting adolescents and adults. In the post elimination era, dealing with cases that test IgM positive is increasingly challenging. In 2008, six of the eight cases with rubella IgM positive results can be considered as false positives. For four cases, it was not possible to determine the diagnosis; however, the clinical and epidemiological data available suggest that they were not rubella cases. Two of those cases had been recently vaccinated, but not less than 14 days previously. Therefore they did not meet the terms of the definition for vaccine reaction. The retrospective case search results indicates that most, but not all, cases meeting the case definition for measles/rubella were detected by the system. Following these experiences, the country put forward several recommendations aimed at strengthening measles/rubella surveillance. They include close monitoring of surveillance indicators; periodic active case searches; strengthening of the collaboration between Epidemiology and the National Health Laboratory to ensure the availability of supplies for virus detection, timely shipping of specimens to a reference laboratory, collection

of a second sample when appropriate, and better use of complementary diagnostic tests; and maintaining collaboration with the Pan American Health Organization (PAHO) for technical advice.

Editorial Note

The Measles/Rubella Laboratory Network held a meeting in Costa Rica on 23 August 2009. The topic of sporadic positive IgM results was discussed at large. Several recommendations were proposed, and later endorsed by PAHO's Technical Advisory Group on Vaccine-preventable Diseases (TAG). The recommendations related to the Guatemala experience described here include (1) The laboratory and epidemiologic teams from each country should use the specific PAHO laboratory testing guidelines for classification of sporadic measles and rubella cases according to their needs and (2) Measles, rubella, and congenital rubella syndrome cases should be classified only after the laboratory and epidemiologic teams have reviewed all laboratory results and epidemiologic data. ■

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Tetanus-Diphtheria Immunization of Pregnant Women in Guyana

The prevention of neonatal tetanus (NNT) is a high priority for Guyana. For the last 10 years, the country has reported no NNT cases. The achievement was made possible by emphasizing NNT prevention among health workers, including proper recording of tetanus-diphtheria (Td) coverage in pregnant woman. When assessing

vaccination status, health workers must check whether a pregnant woman has received the primary childhood immunization series of three DTP doses and two booster doses.

The childhood immunization schedule in Guyana currently consists of a tetanus-containing vaccine administered at the following ages: 2,

4, 6 months; 18 months; 3 years and 9 months. The annual target population for NNT prevention includes all pregnant women of that particular year.

At a pregnant woman's first contact with the health facility, health personnel enquire about her previous immunization history and examine her immunization cards/records to determine the number of Td doses required. A pregnant woman is deemed fully protected against tetanus

Table 1. Td Coverage in Pregnant Women, January-December 2007

Region	Target	Inadequately Immunized	Fully Immunized for this Pregnancy				Fully Immunized Prior to the Pregnancy	Total Fully Immunized f = b+c+d+e	% Td Coverage for pregnant women = f/Targetx100
		a (1 st dose)	b (2 nd Dose)	c (3 rd Dose)	d (4 th Dose)	e			
Region 1	876	119	112	88	62	495	757	86.4%	
Region 2	1,036	84	8	5	8	931	952	91.9%	
Region 3	1,077	0	0	0	0	1,077	1,077	100%	
Region 4 (Georgetown)	1,299	33	61	200	356	649	1,266	97.5%	
Region 4 (E.C.D.)	1,290	14	48	112	229	887	1,290	100%	
Region 4 (E.B.D.)	1,144	48	160	165	225	539	1,137	99.0%	
Region 4 (Municipality)	927	0	11	41	532	342	926	99.9%	
Region 5	952	0	0	0	12	814	826	86.8%	
Region 6	2,144	0	1	5	100	2038	2,144	100%	
Region 7	632	0	0	0	0	514	514	81.3%	
Region 8	513	66	98	89	125	135	513	100%	
Region 9	773	9	0	0	67	697	764	98.8%	
Region 10	956	41	23	66	186	640	956	100%	
Private Sector									
Total	13,619	414	522	771	1,902	9,758	13,122	96.4%	

upon receipt of 6 doses of a tetanus-containing vaccine, with the last dose being received in the adolescent period.

The following scenarios are used to determine the number of doses of tetanus-containing vaccines to be administered to pregnant women when they visit the health facility:

- 1) If a pregnant women received only 3 DTP doses (primary series) in childhood, she will need:
 - a) 1 Td dose at the first visit;
 - b) Another Td dose 4 weeks later, in order to be fully immunized for that pregnancy; and
 - c) 1 more Td dose at least 1 year later to be fully immunized for all her childbearing years.
- 2) If a pregnant woman received 4 DTP doses in childhood, she will need:
 - a) 1 Td dose at that visit to be considered fully immunized for the current pregnancy; and
 - b) 1 more Td dose at least 1 year later to be fully immunized for all her childbearing years.
- 3) If a pregnant woman received 3 DTP doses in childhood and 1 Td or 1 DT dose later, she will

be immunized in the same way as a woman having received 4 DTP doses.

- 4) If a pregnant woman received 4 DTP doses in childhood and 1 Td dose later she will need:
 - a) 1 Td dose at present contact for her to be fully immunized for the pregnancy: At this point she is considered fully immunized for all her childbearing years and will NOT require further Td doses.
- 5) If prior to her pregnancy, a pregnant woman

received 4 DTP doses and 2 Td boosters, she is fully immunized and does not require additional Td doses for this pregnancy or in the future.

Table 1 shows how Td coverage among pregnant women is calculated in a hypothetical situation. Such monitoring of Td vaccination prevents the unnecessary revaccination of pregnant women.

If a pregnant woman visits the health facility for

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Table 2. WHO Td Guidelines for Women of Childbearing Age and Adults Who Have NEVER been Vaccinated Before

Dose	When to Administer	Expected Duration of Protection
Td 1	At first contact or as early as possible in pregnancy	None
Td 2	At least 4 weeks after Td 1	1–3 years
Td 3	At least 6 months after Td 2	5 years
Td 4	At least one year after Td 3 or during subsequent pregnancy	10 years
Td 5	At least one year after Td 4 or during subsequent pregnancy	All childbearing years

Adapted from World Health Organization. Immunization Policy. WHO/EPI/GEN 95.03 Rev. 1.

Measles/Rubella/CRS: Final Classification, 2008

Country	Total Measles/ Rubella Suspect Cases Notified	Confirmed Measles*			Confirmed Rubella			Congenital Rubella Syn- drome (CRS) Cases	
		Clinical	Laboratory	Total	Clinical	Laboratory	Total	Suspect	Confirmed
Anguilla	1	0	0	0	0	0	0	0	0
Antigua & Barbuda	0	0	0	0	0	0	0	0	0
Argentina	3194	0	1	1	0	2126	2126	0	1
Aruba	...	...	...	...	...	...	...	...	...
Bahamas	4	0	0	0	0	0	0	0	0
Barbados	9	0	0	0	0	0	0	0	0
Belize	71	0	0	0	0	0	0	0	0
Bermuda	1	0	0	0	0	1	1	...	...
Bolivia	459	0	0	0	0	0	0	...	...
Brazil	24247	0	0	0	213	1988	2201	264	35
Canada	...	0	62	62	0	5	5	...	...
Cayman Islands	0	0	0	0	0	0	0	0	0
Chile	348	0	0	0	...	...	14	188	3
Colombia	2132	0	0	0	0	0	0	243	0
Costa Rica	80	0	0	0	0	0	0	0	0
Cuba	815	0	0	0	0	0	0	0	0
Dominica	0	0	0	0	0	0	0	0	0
Dominican Republic	129	0	0	0	0	0	0	...	...
Ecuador	601	0	1	1	0	0	0	2	0
El Salvador	130	0	0	0	0	0	0	87	0
French Guiana	14	0	0	0	0	1	1	...	...
Grenada	1	0	0	0	0	0	0	0	0
Guadeloupe	...	...	...	...	...	...	...	...	...
Guatemala	313	0	0	0	0	0	0	9	0
Guyana	55	0	0	0	0	0	0	0	0
Haiti	8	0	0	0	0	0	0	1	0
Honduras	219	0	0	0	0	0	0	28	0
Jamaica	642	0	2	2	0	0	0	0	0
Martinique	...	...	...	...	...	...	...	...	...
Mexico	5704	0	0	0	0	46	46	...	1
Montserrat	0	0	0	0	0	0	0	0	0
Netherlands Antilles	...	...	...	...	...	...	...	...	...
Nicaragua	120	0	0	0	0	0	0	0	...
Panama	111	0	0	0	0	0	0	0	0
Paraguay	274	0	0	0	0	0	0	3	0
Peru	1288	0	1	1	0	0	0	772	0
Puerto Rico	...	...	...	...	...	...	...	...	...
St. Kitts & Nevis	0	0	0	0	0	0	0	0	0
St. Lucia	1	0	0	0	0	0	0	0	0
St. Vincent & Grenadines	1	0	0	0	0	0	0	0	0
Suriname	7	0	0	0	0	0	0	0	0
Trinidad & Tobago	54	0	0	0	0	0	0	0	0
Turks & Caicos	0	0	0	0	0	0	0	0	0
United States	...	0	140	140	0	17	17	0	2
Uruguay	4	0	0	0	0	0	0	...	...
Venezuela	1441	0	0	0	0	0	0	...	...
Virgin Islands (UK)	2	0	0	0	0	0	0	0	0
Virgin Islands (US)	...	...	...	...	...	...	...	...	...
TOTAL	42480	0	207	207	213	4184	4412	1597	42

... No information provided * Import-related cases

Source: MESS and country reports through the PAHO-WHO/UNICEF Joint Reporting Form (JRF), 2008.

Updated: 7 December 2009

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the first time and this is NOT her first pregnancy, her vaccination status must be reviewed against the guidelines to ensure that she has been appropriately vaccinated. Efforts are usually made

by health workers to complete vaccination schedules post-pregnancy.

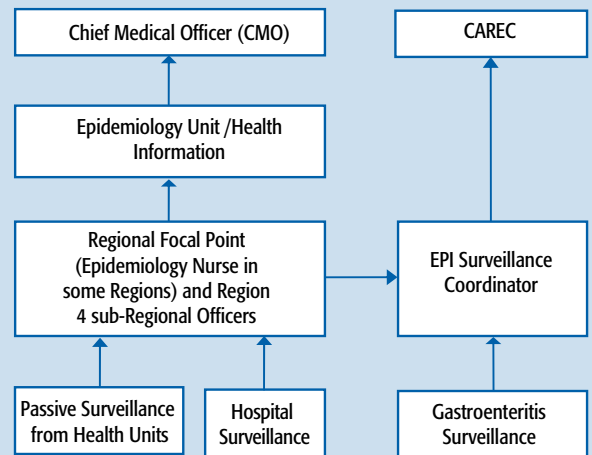
The World Health Organization (WHO) Guidelines in Table 2 are used for individuals who have never been vaccinated. After Guyana start-

ed using these guidelines, Td coverage rates in pregnant women increased to >95% for the last 5 years. The guidelines, including scenarios, are now part of Guyana's EPI Manual. ■

Tetanus and Diphtheria Surveillance in Guyana

Guyana initiated surveillance for vaccine-preventable diseases (VPD) in 1991. Tetanus and diphtheria are reportable diseases in Guyana. The Epidemiology Unit of the Communicable Diseases Department has primary responsibility for surveillance. There are two types of surveillance reporting in Guyana: routine surveillance and sentinel reporting, with 105 sentinel reporting sites throughout the country. Additionally, health workers make weekly home visits to actively look for VPD cases. Health workers from the sentinel reporting sites fill out national surveillance report forms and send them to regional offices on a weekly basis. The regional offices send weekly reports to the national Epidemiology Unit for data analysis and to ensure appropriate response (Figure 1). Health workers are encouraged to familiarize themselves with signs and symptoms of tetanus and diphtheria in addition to other VPDs. The Medex, or senior health worker, initiates the investigation when a case is suspected. A recent EPI evaluation found that 80% of visited health facilities had a designated person responsible for surveillance. Samples are usually sent to PAHO's Caribbean Epidemiology Centre (CAREC) for further investigation. A newly built National Public Health Research Laboratory will allow for the investigation of most samples soon. The main challenge of surveillance in Guyana is to ensure timely receipt of surveillance reports from remote hinterland areas.

Figure 1. Flow of Surveillance Data in Guyana



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