



Comprehensive Family Immunization Unit
Department of Family, Gender and Life Course



THIRTY-SECOND MEETING OF THE CARIBBEAN IMMUNIZATION MANAGERS

FINAL REPORT

**St. Georges, Grenada
28-30 November 2016**

Contents

1. INTRODUCTION	4
2. OBJECTIVES OF THE MEETING	5
3. UNIVERSAL VACCINATION COVERAGE	5
3.1. Summary of recommendations from May 2016 Ad-hoc TAG meeting	5
3.2. The Regional Immunization Action Plan and Update on EPI	6
3.3. Overview of EPI in the Caribbean	7
4. PROGRESS OF MEASLES, RUBELLA AND CRS ELIMINATION	10
4.1. Update on measles, rubella, CRS elimination in the Americas and sustainability of elimination	10
4.2 Review of Fever/Rash and CRS Surveillance in the Caribbean	11
4.3 Review of measles and rubella laboratory test results in the Caribbean in the context of Zika virus and other arbovirus infections	13
4.4. Country Reports on F/R surveillance and status of indicators in the time of Zika virus	14
4.4.1 Grenada	144
4.4.2 Guyana	144
4.5. Country Reports on sustainability of measles/rubella/CRS elimination	14
4.5.1 Curacao	14
4.5.2 Aruba	145
4.5.3 Dominica	14
4.6. Update on Hepatitis B vaccination in the Americas	16
4.7. Experience with routine birth dose of Hepatitis B- St. Kitts and Nevis	17
4.8. EPI Plan of Action- Use of the new tool	18
5. SUSTAINING POLIO ERADICATION	18
5.1. Update on Global Polio Eradication and Endgame Strategic Plan with emphasis on the switch	18
5.2. AFP Surveillance in the Caribbean	21
5.3. Country Reports on AFP surveillance and indicators with reference to Zika virus outbreak	244
5.3.1 Barbados	244
5.3.2 Jamaica	254
5.3.3 Suriname	255
5.4 Country reports on tOPV to bOPV Switch	25
5.4.1 Anguilla	25
5.4.2 British Virgin Islands	25
5.4.3 Turks and Caicos	26
5.5 Update on Polio Containment globally and regionally	266
5.6 Country Reports on Polio Containment	28
5.6.1 Bermuda	28
5.6.2 Bahamas	28
6. PROGRAMME ACTIVITIES AND EXPERIENCES	29
6.1. Update on seasonal influenza vaccination in the Americas	29
6.2. Communication strategies to improve influenza vaccination uptake	30
6.3. Influenza Outbreak and impact on vaccination	30

6.3.1 Trinidad and Tobago _____	30
6.3.2 Jamaica _____	31
6.4. Overview of Vaccination Week in the Americas _____	31
6.5. Country reports on Vaccination Week in the Americas Error! Bookmark not defined.	
6.5.1 Cayman _____	32
6.5.2 Montserrat _____	33
6.5.3 St. Maarten _____	34
7. DATA QUALITY, COLD CHAIN and PROGRAMME MANAGEMENT _____	34
7.1. Update on PAHO EPI Revolving Fund _____	34
7.2. Update on the Electronic Immunization Registry _____	35
7.3. Cold Chain assessment and training- St. Kitts and Nevis _____	37
7.4. MMR Vaccination Coverage Survey _____	37
7.4.1 Barbados _____	37
7.4.2 St. Lucia _____	37
7.5 Sero-surveillance for vaccine-preventable diseases Error! Bookmark not defined.	8
8. NEW VACCINES _____	38
8.1. Update on new vaccine introduction in the Americas _____	38
8.2. Systematic review of impact and effectiveness of PCVs _____	39
8.3. Country Reports on HPV Vaccination _____	40
8.3.1 Antigua and Barbuda _____	40
8.3.2 Belize _____	40
8.3.3 St. Vincent and the Grenadines _____	41
9. Surveillance and Immunization Awards _____	42
10. WORKSHOPS ON EPI RELATED ACTIVITIES _____	42
10.1 Global Vaccine Market & Demand Planning _____	43
10.2 Use of the Auto-disable (AD) Syringes _____	44
10.3 Planning for the introduction of HPV vaccine into routine immunization programmes _____	45
10.4 Developing communication messages and crisis management plans for HPV vaccine _____	46
10.5 Regional Immunization Action Plan and monitoring through the JRF _____	46
10.6 Review for 2016 JRF process and new indicators _____	47
10.7 Recommendations to complete the JRF and comparison of 2015/2016 JRF _____	47

Thirty-Second Caribbean Immunization Managers' Meeting

1. INTRODUCTION

The 32nd Caribbean EPI Managers' Meeting was held at the Grenadian by Rex Resort from 28-30 November 2016. This was followed by workshops on the PAHO EPI Revolving Fund, the use of the Auto-disabled syringes, HPV vaccine introduction planning and the Regional Immunization Action Plan. The meeting convened 71 participants from 26 countries and territories as well as immunization experts from the Pan American Health Organization (PAHO/WHO), the Caribbean Public Health Agency (CARPHA) and the Secretariat of the Caribbean Community (CARICOM). 10 additional health staff from the host country Grenada also attended the meeting.

The opening ceremony was chaired by Ms. Hazeline Benjamin, the acting Chief Nursing Officer of Grenada. She was joined at the head table by the Chief Medical Officer (CMO) of Grenada, Dr. George Mitchell, the Permanent Secretary of the Ministry of Health, Ms. Pauline Peters, the EPI Manager, Ms. Allyson Clouden, the PAHO/WHO Country Programme Specialist, Ms. Tessa Stroude, representing Dr. Godfrey Xuereb, PAHO/WHO Representative for Barbados and the Eastern Caribbean, the PAHO/WHO Comprehensive Immunization Unit Chief (Dr. Cuauhtémoc Ruiz-Matus), the Programme Manager, Health Sector Development, CARICOM (Dr. Rudolph Cummings) and the Chair of the PAHO/WHO Technical Advisory Group (TAG) on Vaccine-Preventable Diseases (Prof. Peter Figueroa).

After a brief introduction of the honorable guests involved in the opening ceremony by the Chairperson, the national anthem of Grenada was sung, led by Ms. Melissa Pivotte-Prince. This was followed by prayer and welcome remarks by Ms. Peters. She emphasized the diversity of the Island and recognized the dedication of health workers who administer vaccines to target populations across the Island.

In a brief interlude to the welcome remarks, a 12 year old high school student recited a short poem entitled 'Wealth is health'. Her delivery stressed the importance of healthy behaviors and choices to achieve economic development at the individual-, community- and society-levels. This poem was a perfect introduction to Dr. Rudolph Cummings' remarks. He spoke about the inter-regional cooperation and achievements in health, highlighting the strength of immunization programmes as an indicator of success in health.

Following CARICOM's remarks, Dr. Cuauhtémoc Ruiz-Matus shared warm thanks to the government of Grenada for hosting the 32nd Caribbean EPI Managers Meeting on behalf of PAHO. He noted that the long tradition of inter-region cooperation in training and knowledge sharing at the annual EPI Managers Meeting, which has met every year for almost as long as the history of the EPI in the Region, is a cornerstone in strengthening immunization in the sub-region. He also recognized the innovative strategies employed by immunization programmes in the Caribbean and noted that the rest of the world is learning from this work.. In his remarks, Prof. Figueroa reiterated thanks to the government of Grenada for the warm welcome to the Island. He bridged Dr. Ruiz Matus' comments to his own vision for even stronger immunization programmes in the Caribbean as we move into the future. While the Caribbean has paved the way in achieving high coverage and accelerated programmatic innovation, Prof. Figueroa made a call to EPI Managers in the Caribbean to focus efforts on the vision for the future, specifically appealing to considerations around the introduction of the HPV vaccine for adolescent girls.

Leading into the feature address from the CMO of Grenada, a student social theater troupe from the Corinth Government School presented a short skit about the importance of timely vaccination in early childhood. Five students developed a short storyline about how a young mother seeking advice from neighbors and health workers on keeping her infant healthy. Dr. George Mitchell, in his remarks, reflected on the achievements of immunization as a flagship programme of the Ministry of Health in Grenada. He also noted support from partner agencies including PAHO/WHO and CARICOM as a critical catalyst for improved immunization in the country and sub-region. At the same time, he called on countries to take ownership of their programmes by initiating programme improvements with strong political will and commitment from local governments. He closed by pledging his commitment to immunization and the programme's continued success in Grenada.

In closing of the opening ceremony, Ms. Allyson Clouden, EPI Manager for Grenada gave a brief vote of thanks to recognize all contributions to the opening ceremony and preparations for the meetings to follow.

2. OBJECTIVES OF THE MEETING

Overall objective: To analyze achievements for 2016 and plan activities for 2017 while sharing country experiences on the immunization programme.

Specific objectives:

1. To review the status of the EPI programme in the Region of the Americas and the Caribbean and to identify areas that require strengthening
2. To update information on selective topics of common interest to countries in relation to immunization, service delivery and surveillance of vaccine preventable diseases
3. To develop country action plans with specific budgets for each activity to achieve the targets and objectives set for 2017
4. To discuss the sustainability of Measles, Rubella and Congenital Rubella Syndrome (CRS) elimination in the Americas and the Caribbean
5. To discuss the implementation of the Polio Eradication and Endgame Strategic Plan 2013-2018 with special emphasis on:
 - a. The switch from tOPV to bOPV and Responding to a poliovirus event or outbreak.
 - b. Wild Polio and Sabin type 2 virus containment
6. To discuss the status and advances made in the surveillance and management of vaccine preventable diseases especially in light of the arbovirus infections e.g. Zika
7. To assess the status of and strategies for the introduction of newer and underutilized vaccines in the national immunization schedules
8. To share updates on EPI related activities or initiatives implemented in countries

3. UNIVERSAL VACCINATION COVERAGE

3.1. Summary of recommendations from May 2016 Ad-hoc TAG meeting

Prof. Figueroa summarized the recommendations from the May 2016 ad-hoc TAG meeting, and highlighted the current successes and challenges for vaccination programs in the region. He commended the countries for the successful switch from tOPV to bOPV, the introduction of IPV and for their progress with poliovirus containment. There is a global shortage of IPV; however the evidence shows that 2 fractional intradermal IPV doses can provide equal or better

protection than one intramuscular dose. TAG wanted to remind countries of the importance of administering hepatitis B vaccine at birth, and that all health workers should be vaccinated against hepatitis B. TAG also informed of its recent assessment of the feasibility of eliminating mother-to-child transmission (MTCT) and early childhood transmission of hepatitis B from all countries in the Americas by 2020. The assessment concluded that elimination would be feasible provided that 95% coverage for the third-dose among infants aged <1 year, and 95% coverage of timely birth dose vaccination could be reached. While Hep B is the next disease targeted for elimination in the region, Haiti should prioritize the elimination of neonatal tetanus and might need further support in achieving it.

A number of new vaccines were discussed, among them dengue, HPV, and PCV. TAG reviewed 5 candidate dengue vaccines, looking specifically at CYD-TDV, and there was insufficient evidence to recommend introduction of a dengue vaccine at the meeting held in July 2015. TAG emphasized that the approach to dengue control must be an integrated approach. Prof. Figueroa reported that the Global Advisory Committee on Vaccine Safety has carefully examined the safety of HPV at 6 separate meetings and concerns raised with respect to possible adverse events were found to be unrelated to the HPV vaccine. There is a need to effectively communicate that the HPV vaccine is safe and effective in preventing cancer of the cervix. If countries achieve high coverage in girls with 2 doses, it is not necessary to vaccinate boys as well. Lastly, PCV should be used in routine programmes because it not only protects children but also other age groups through herd immunity, including the elderly. Pneumococcal surveillance needs to be established at sentinel sites. TAG does not recommend the use of PPV23, given the high levels of herd immunity protection possible with PCV. In addition to the introduction of new vaccines, the region should prioritize maintaining routine immunization coverage at a level >95% in all districts.

3.2. The Regional Immunization Action Plan and Update on EPI

In 2017, the Expanded Programme on Immunization (EPI) in the Americas will celebrate 40 years of existence. Since its creation in 1977, through a resolution during PAHO's Directing Council, the EPI has evolved and grown in terms of the number of vaccines administered, the size of each regional birth cohort, the budgets allocated to national programmes and the scope of the populations targeted. Through their national EPI programmes, the countries and territories of the Americas have been leaders in the control and elimination of many vaccine-preventable diseases, including the eradication of polio in 1994 and the elimination of rubella in 2015. In 2016, the Region was also able to declare the successful elimination of measles.

A strong immunization programme can have positive repercussions throughout society, including gains in school enrollment and education, longer life expectancies and increased economic productivity. Recent research has shown that the return on investment- including savings in healthcare costs and prevention of lost wages and loss of productivity due to illness- for every dollar invested in vaccinating children in low and middle income countries is larger than for other interventions such as pre-school education, investments in public infrastructure and use of community health workers¹.

For the year 2015 regional coverage for DTP3 vaccine was 91% (87% for the Caribbean, including Belize and Bermuda). National coverage rates, however, vary substantially across the Region (range 72%-100%) and even more so when examining data at the subnational level. The challenge for countries is to maintain and/or increase their high national coverage rates for all antigens, while ensuring that high coverage is also homogenous at all levels of the health system and for all population groups.

In September 2015, the Regional Immunization Action Plan (RIAP) was endorsed during PAHO's Directing Council as the guiding policy framework for immunization programmes in the Region. The four strategic areas of the RIAP include: 1) Sustaining the achievements; 2) Completing the unfinished agenda; 3) Tackling new challenges; and 4) Strengthening health services for effective vaccine administration. As countries move towards the goal of achieving universal health coverage, immunization coverage can play a key role as a means to track progress. Going forward, the focus of EPI programmes is now on vaccinating individuals throughout the life course. Under the umbrella of health services, immunizations can also be integrated with other preventative interventions provided along the continuum of care for all ages.

3.3. Overview of EPI in the Caribbean

2017 marks 40 years of the EPI and over the past 39 years, the Governments and peoples of the Caribbean Community have remained committed to the sustainability of the immunization programme, which continues to be the most successful intervention in health. This commitment is demonstrated by 98% funding of the cost of the Immunization programme and 99% funding of the cost of the vaccines. A number of the Regional Immunization Action Plan (RIAP) objectives and indicators have been met but there remain areas which need improvement.

The year 2015 saw some improvements in coverage, but concerns remain regarding MMR2 coverage. The vaccination coverage in the Caribbean is below the average coverage for the Region of the Americas and the introduction of newer vaccines such as HPV has been slow.

The objectives of the EPI programme remain as follows:

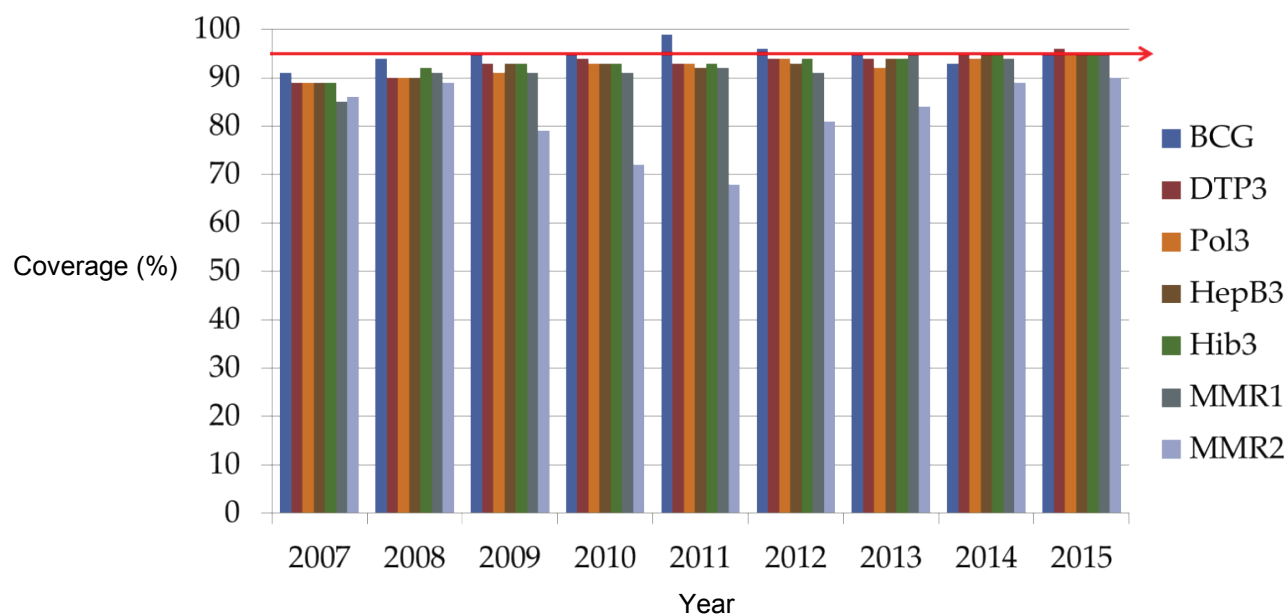
1. To achieve equity in the provision of vaccine services by achieving and maintaining $\geq 95\%$ coverage for all antigens at national, municipal and district levels
2. To maintain the polio eradication status
3. To maintain measles, rubella and CRS elimination status
4. To maintain and strengthen surveillance for VPDs with emphasis on measles, rubella, CRS and polio
5. To advocate for the introduction of new and underutilized vaccines using an evidence based approach

RIAP progress:

1. Only Haiti still hasn't eliminated neonatal tetanus
2. In regards to DTP targets, 13 countries have achieved at least 95% coverage
3. 5-6 countries plan to introduce HPV in 2017
4. In terms of reducing maternal and infant mortality
 - Almost all countries include DT vaccines, but few countries have influenza vaccine as routine for pregnant women
 - All countries include other integrated services in addition to vaccination
5. Only 9 countries have specific legislation for children, specifically for entry into the school system

The objective of at least 95% coverage for all antigens was achieved by many countries; however, for the Caribbean Sub-Region, this was achieved only for DTP3, Hib 3 and HepB 3 in 2014. For 2015, 95% coverage was achieved for all the commonly used antigens (DTP3/Hib3/HepB3, Polio3 and MMR1), but not for MMR2 which only achieved 90% coverage. Also of concern is the fluctuation of MMR coverage throughout the years, because that implies that mop-up activities are needed to ensure equitable coverage for each birth cohort.

Fig.1: Vaccination coverage by antigens given, Caribbean Sub-Region, 2007-2015



Despite relatively high national vaccination coverage for all antigens in most countries sustained for over three years this was not equitably distributed throughout the regions, as there remained municipalities with low vaccination coverage in most countries in 2015.

Table 1: Percentage of municipalities by coverage levels reported, 2015

Vaccine	Coverage Levels				
	<80%	80-89%	90-94%	95-100%	>100%
DTP3	8	12	23	39	18
Polio 3	11	13	23	36	17
MMR 1	9	18	20	36	17
MMR 2	19	24	21	23	13

In 2015, some 43-47% of municipalities had coverage less than 95% for DTP3, Polio 3 and MMR1. The continued reporting of coverage of > 100% implies possible ongoing challenges with the accuracy of the target population for children < 1 year old. Of note, for one country all districts reported >100% coverage for all antigens. A couple of the smaller islands have as much as 5-7% of their 0-11 months old born out of country, which may not be included in their denominator/target population for vaccination coverage. A special effort must be made to include those born outside the country and make sure that they are counted in the numerator and the denominator.

Some 81% of the countries had DTP3 coverage >90% nationally, and over 80% of municipalities with coverage > 80% in 2015. This is in keeping with the GVAP/RIAP indicator of

percentage of districts with $\geq 80\%$ coverage with 3 doses of diphtheria-tetanus-pertussis-containing vaccine.

Introduction of newer and underutilized vaccines in the routine immunization schedule in the public sector was limited to only two vaccines; HPV was introduced in Anguilla and Belize and rotavirus vaccine was introduced in Bermuda. No additional country in the Sub-Region introduced pneumococcal conjugate vaccine in 2015. Almost all countries use influenza vaccine for various risk groups but vaccination is voluntary, even for pregnant women and health care workers.

All countries of the Caribbean observed the 14th Vaccination Week in the Americas with special emphasis on the polio switch, which most countries did on the 26th of April. Training in EPI was primarily face-to-face in areas such as vaccine preventable diseases surveillance, cold chain management and Vaccine Supply Stock Management and occurred in Cayman, St. Kitts and Nevis and Jamaica respectively. Grenada expanded the use of their Electronic Immunization Registry and St. Lucia disseminated the findings of their MMR coverage survey.

Countries continued procurement of vaccines and supplies through the PAHO Revolving Fund for EPI but there remain concerns regarding the cold chain excursions on arrival of the vaccines in countries due to packaging issues by suppliers as well as the timeliness of payment on invoices by some countries. Outstanding invoices make it difficult for the Revolving Fund to procure vaccines from suppliers in a timely manner.

Despite the achievements, there continue to be challenges, including fiscal constraints, outbreaks of infectious diseases, and transitioning of EPI managers. The country responses to arbovirus infections and tropical storms/hurricanes stretched the capacity of the human resources, including the EPI managers, and challenged the surveillance systems for vaccine preventable diseases. From these challenges also arose opportunities to strengthen health infrastructure and capacity building for surveillance and responses as well as to engage the public in the benefits of vaccination.

The Governments remain committed to the goals and objectives of universal immunization and elimination of vaccine preventable diseases. Much has been achieved in the EPI programme for 2015 and the first half of 2016. Coverage has been improving for DTP3, Polio 3, Hib3, HepB3 and MMR1 but is still low for MMR2. Despite high national coverage, homogeneity of coverage throughout each region requires improvement in most countries as well as continued strengthening and coordination of VPD surveillance at the country level. 2017 marks 40 years of EPI in the Caribbean and is a cause for celebration and efforts to improve the programme.

UNIVERSAL VACCINATION COVERAGE: Conclusions and Recommendations:

1. Countries and territories in the Caribbean are commended for their timely monitoring and reporting of the Regional Immunization Action Plan (RIAP). The Caribbean should note that a mid-term review of the RIAP will be provided at the 2017 PAHO Directing Council, reflecting the progress reported at sub-regional levels. Countries are therefore urged to submit completed JRF reports by March 2017.
2. Coverage has been improving for DTP3, Polio 3, Hib3, HepB3 and MMR1, but is still low for MMR2. Despite high national coverage, homogeneity of coverage requires improvement in most countries. Countries and territories are strongly urged to achieve coverage levels consistently across the routine schedule above 95% at national level and in each and every district.

3. Those countries without vaccination laws should consider implementing them in order to ensure a line item in the budget for vaccination, as well as to require children and other persons to be vaccinated.

4. PROGRESS OF MEASLES, RUBELLA AND CRS ELIMINATION

4.1. Update on measles, rubella, CRS elimination in the Americas and sustainability of elimination

On 22-23 April 2015, the International Expert Committee (IEC) for measles and rubella elimination in the Americas reviewed the epidemiological information for the period 2011-2014 presented by the Member States and determined that the Region had interrupted the endemic transmission of rubella. The last confirmed case of endemic rubella was reported on 3 February 2009 in Argentina, while the last confirmed case of congenital rubella syndrome was in a baby born on 26 August 2009 in Brazil. Genotype 2B was identified in the last endemic rubella outbreaks in both Argentina and Brazil.

Regarding the measles situation, in accordance with the assessment report on the 2015 Global Vaccine Action Plan (GVAP), Brazil confirmed the last endemic measles case on July 6th, 2015. Between April and May 2016, all the Ministries of Health of the Member States updated their country reports, which were endorsed by the national committees (for the verification of the elimination of measles, rubella, and congenital rubella syndrome); these reports described and analyzed the epidemiological situation of measles, and provided evidence that they have maintained the interruption of endemic transmission of this disease in their territories. In July 2016, Brazil presented to the IEC definitive proof of the absence of endemic transmission of the virus. Following this, the IEC declared the elimination of the endemic measles virus in Brazil as well as approved country reports, and during the Directing Council on September 27th, 2016, declared the elimination of endemic measles virus in the region, making it the only region in the world to do so.

The challenges for the short and long term period are:

- a) To ensure that all countries achieve at least 95% coverage in at least 80% of municipalities for both the first and second doses of the measles, mumps, and rubella (MMR) vaccine. Regional MMR coverage in the last three years has been in the 92-94% range, but is very uneven between countries and municipalities. This means that every year a group of susceptible individuals transfers the risk to other age groups such as adolescents and young adults who are not immunized.
- b) To increase MMR1 and MMR2 vaccination coverage in high quality follow-up vaccination campaigns.
- c) To maintain high-quality epidemiological surveillance that facilitates the timely detection and study of suspected cases and a high rapid response to imported cases. To accomplish this, it is necessary to maintain a laboratory network that permits differential diagnosis with other diseases currently present in our Region (dengue, chikungunya and, especially, Zika virus infection).
- d) To ensure that countries and strategic partners maintain their political commitment to the sustainable elimination of these diseases, given the other public health priorities that exist at the global, regional, and country levels (for example, infectious diseases such as Zika virus).

- e) To advocate with other WHO regions to step up the process of global eradication of measles

PAHO next steps in the Region are to:

- a) Prepare and implement a standardized regional framework formulating guidelines to monitor progress toward the permanent sustainability of the medium and long term elimination of measles, rubella and CRS.
- b) Promote the implementation of the strategies contained in the regional Plan of Action on Immunization in order to achieve uniform vaccination coverage (95% or higher) with the first and second dose of MMR vaccine in at least 80% of the municipalities of each country by strengthening the regular immunization programme.
- c) Prepare and apply tools to standardize and guarantee the quality of micro-planning, implementation, and evaluation of vaccination campaigns in order to achieve the greatest possible population immunity in the coming years by guaranteeing at least 95% coverage in all vaccination campaigns.
- d) Promote the preparation of a rapid and timely response to imported cases of measles, rubella, and congenital rubella syndrome in order to prevent the reemergence of endemic transmission in the countries, and maintain the quality of surveillance of large-scale events that put the Region at risk of imported cases from other regions of the world.

4.2. Review of Fever/Rash and CRS Surveillance in the Caribbean

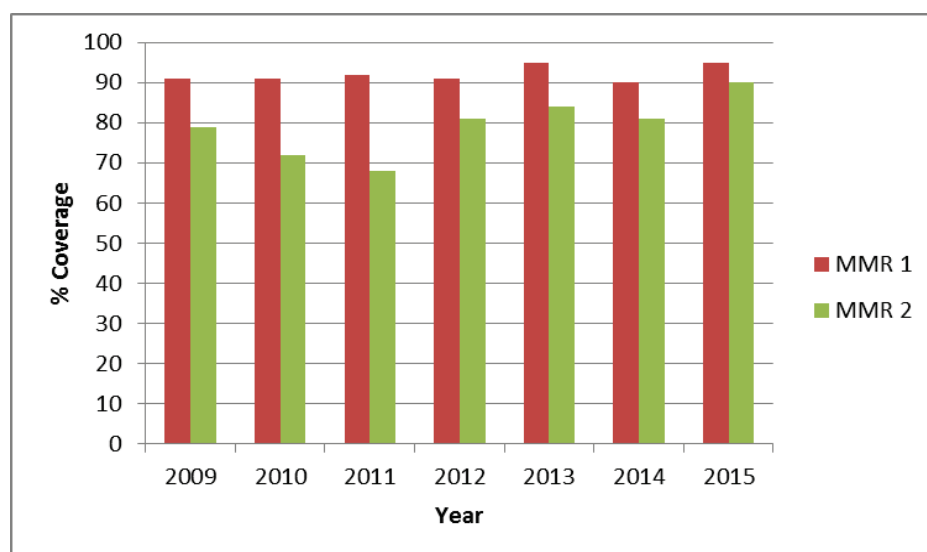
The Caribbean has been free of measles for 25 years and rubella for 15 years, but it continues to remain at high risk for the importation of measles and rubella cases due to the large tourism industry as demonstrated by importations over the past ten years. This underlines the need to maintain high quality surveillance for suspected cases.

The objectives of the Rash and Fever Surveillance are:

- To maintain elimination of measles, rubella and CRS
- To achieve timely, complete, regular and accurate surveillance and reporting for measles and rubella with active case finding
- To maintain > 95% coverage for measles and rubella vaccine for each birth cohort
- To ensure all measles, rubella and CRS Indicators are met in each country
- To ensure no established local transmission of measles and rubella following importations

From 2010-2015, MMR1 coverage in the Caribbean ranged from 90-95%, whereas coverage for MMR2 was lower, ranging from 68-90%.

Fig.2: MMR1 and MMR2 coverage in the Caribbean, 2009-2015



Currently there are 714 surveillance sites for measles and rubella from 20 countries. In 2016, up to Epidemiological week 44, there were 466 suspected measles, rubella and CRS cases reported, but no cases were confirmed as measles, rubella or CRS. The rate of reporting of cases was 6.5 per 100,000 persons. Out of all cases, 88% were adequately investigated, 98% had adequate sample collection, 20% of samples were received by the lab within 5 days and 72% of the lab results were returned within 4 days.

Fever and rash cases were reported, primarily by Jamaica (37%), Belize (30%), Guyana (11%) and Grenada (7%), with almost all countries reporting cases of suspected or confirmed Zika infection. The Zika outbreak in the Caribbean challenged the surveillance for measles and rubella as countries kept the surveillance systems separate with the risk of missing possible cases of measles and rubella, due to the similarity in symptoms among diseases. Age distribution of cases before 2016 was in children under 10 years old, but with the emergence of Zika there was a shift of fever and rash in adults, which is consistent with the distribution of Zika infection. Because of the high dependency on tourism, we could have missed imported cases of measles and rubella due to the high focus on Zika.

Table 1: Surveillance indicators 2011-2016 (wk 44)

Year	Sites reporting weekly (%)	Cases investigated within 48 hrs (%)	Cases with adequate samples taken (%)	Samples received by lab within 5 days (%)	Samples results returned within 4 days (%)	Cases discarded by lab analysis (%)
2011	99	99	96	35	95	97
2012	98	89	97	26	96	100
2013	96	90	91	20	95	99
2014	82	89	83	12	84	94
2015	90	97	92	16	76	96
2016	98	88	98	20	72	94

In conclusion, surveillance indicators for measles, rubella and CRS continued in 2016 but with challenges, especially with timely delivery of samples to CARPHA and return of results. Countries need to improve their efforts to maintain and sustain $\geq 95\%$ coverage for MMR1 and MMR2 at both the national level and district levels; it is also essential that countries remain vigilant for importation of cases and strengthen the surveillance in light of outbreaks of arbovirus infections. There is a need for collaboration between the EPI, laboratory, and surveillance units to ensure quality surveillance. Furthermore, in the presence of Zika, we should not only focus on one disease at the cost of decreasing surveillance of other diseases, like rubella and measles which we have eliminated.

4.3. Review of measles and rubella laboratory test results in the Caribbean in the context of Zika and other arbovirus infections

Besides the present data regarding the situation of Measles and Rubella in the Caribbean and the Americas, it should be taken into account the extraordinary similarities between these vaccine-preventable diseases and other viral diseases, especially those caused by arboviruses. In the last three years, arboviral diseases have become a major challenge for public health systems, health authorities and clinical services. This is a brief revision of some aspects related with the similarities and differences between these diseases in the context of the Caribbean region.

In 2015, only had 8 or 9 countries sent in samples to CARPHA, and in 2016 this increased to 13 countries, which most likely was consequent to the rise of Zika in the region. From November 2015 to August 2016, 2771 specimens were sent to the CARPHA lab, of which 558 were confirmed Zika cases, with 443 confirmed cases being females. It is important to note that sample collection was biased due to mainly monitoring of pregnant women.

The rise of Zika virus in the Caribbean has led to several challenges for the health system. The risk of disease remains high for measles and rubella, through imported cases through tourism, as well as for Zika, through sexual transmission. In regards to laboratory confirmation and surveillance of Zika infection, there are limited human and financial resources to detect and confirm suspected cases. Furthermore, the heightened focus on Zika could be detrimental for

the surveillance of other VPDs, especially measles and rubella, which have been eliminated from the region.

4.4. Country Reports on F/R surveillance and status of indicators in the time of Zika

4.4.1. Grenada

Grenada has shown a marked improvement in reporting and investigation of Fever and Rash over the last four years. With a population of just over 100,000, the surveillance indicator is 2 cases per year. From zero cases in 2012 and 2013, there was a gradual increase in 2014 (1 case) and 2015 (2 cases) and in 2016 the country saw an overwhelming increase up to Epidemiological Week # 40 (34 cases). Due to this recent increase, over the last three years, there has been increased sensitization of staff on fever and rash surveillance.

When the Zika epidemic started in April, it became critical for investigation of cases of fever and rash, symptoms of Zika disease, to rule out Zika infection. The medical staff in both the public and private sector sometimes lapsed with regards to fever and rash surveillance; however the presence of Zika has resulted in improved compliance in reporting especially among the nursing staff who usually initiate investigations. Furthermore, there have been issues with regards to timely reporting, submission of incomplete forms, delay in transportation of samples and receipt of results from CARPHA. Recommendations to address these challenges include regular updates on fever and rash surveillance for healthcare staff, as well as more stringent rules for surveillance.

4.4.2. Guyana

In 2015, Guyana reported 23 suspected cases of fever and rash, of which none were positive for measles or rubella. The first case of Zika was reported in January, 2016 and up to Epi week 44 Guyana had submitted 263 rash and fever samples, 52 of which were submitted by the Maternal and Child Health Department (EPI). The rash and fever cases increased due to similarity with Zika, and the increase in consultations put a strain on the small number of personnel in the office. As a result, the department met with the Vector Control Department, National Public Health Laboratory as well as private institutions in order to make decisions on management of Zika, with an emphasis on reporting of rash and fever.

Status of Surveillance indicators:

- All sites continued to report weekly, however the country had challenges with internet service and consequently weekly reports were sent late to the regional office.
- Sample collection continued to be a challenge, especially in the hinterland
- Samples often had not reached the lab within the 5 days due to transportation issues at both regional and national levels.

4.5. Country Reports on sustainability of measles/rubella/CRS elimination

4.5.1. Curacao

The Youth Health Department (YHD) is part of the Department of Health of Curacao, and is in charge of vaccination programme for the youth between 0-12 years of age. Also in the Department of Health is the Epidemiology Department, which is in charge of the surveillance system and field investigation. The vaccination programme for 4-10 year olds is school based, with two immunization cycles per year with parental consent necessary.

Over the last years, the immunization coverage of the youth has been consistently low (82-86%) for MMR2. This low coverage can now be detected earlier by using the 'real time' vaccination registration. While there have been no clinical reports of measles for the past 10 years, the surveillance system in Curacao does not meet all the requirements stated by WHO for the elimination of Measles, Rubella and Congenital Rubella Syndrome, so it is unclear if the system is truly detecting all cases. However based on the reports of the past three years, no cases of measles or rubella were detected.

Starting in late 2016, the YHD is implementing measures to increase the coverage as well as strengthen the quality of the surveillance system, in cooperation with the Epidemiology Department. These measures include timely monitoring and implementation of catch-up campaigns, using indicators and field investigation to enhance surveillance of VPD, and increasing cooperation with the EPI department to better identify and investigate fever and rash cases in the population.

4.5.2. Aruba

In Aruba, with a total population of approximately 110,000, only one suspected case of measles was officially reported during the period 2012-2015 (of note, this is below the expected 2 cases per year). During this period no suspected cases of rubella or CRS were reported. The surveillance system is passive, dependent on case-based notifications reported to the Department of Contagious Diseases. Infants are vaccinated at six well baby clinics, while older children are vaccinated through a school based programme reaching out to all 70 schools on the island, ensuring coverage over 95% for MMR1 and MMR2 in these age groups. Coverage data calculated at the central level utilizes a comprehensive approach to estimate the overall vaccination coverage, including MMR. While there are no administrative sub-national levels, the six locations of well-baby clinics were utilized as 'municipalities' because the population distribution is aligned to the different regions, which allows for comparability.

The surveillance system, including laboratory surveillance, has not documented any reports of confirmed cases. This documentation was re-verified through a review of the discharge logs at the pediatric ward and the infection prevention and control unit at the island's only hospital, as well as the summary report of the national laboratory. While there is a need for active surveillance and greater collaboration between the surveillance and EPI unit, there is enough evidence to document the interruption of the endemic circulation of the measles and rubella viruses since the last endemic measles and rubella cases in Aruba.

4.5.3. Dominica

In the Commonwealth of Dominica there have been no confirmed cases of measles since 1990, Congenital Rubella Syndrome (CRS) since 1994, or Rubella since 2000. There is also no record of genotyping for measles virus or rubella virus since 1990 and 1994, respectively. With the onset of chikungunya and dengue outbreaks, most of the cases were submitted to rule out any of these three diseases, which all list fever and rash as part of their clinical manifestations.

MMR vaccine coverage for 2012-15 ranged between 94-99% for MMR1 and 89-94% for MMR 2, with MMR vaccine coverage in 2015 as 97% for 1st dose and 95% for the 2nd dose. A rapid house-to-house coverage monitoring (RCM) was conducted in all seven health districts so as to identify any persons less than 5 years who may have been unvaccinated and to identify the areas with inadequate coverage. A total of 886 eligible houses on the island were visited, of which 821 (91%) were fully immunized. 6% had not completed immunization with the MMR schedule, but they were subsequently immunized.

Sustainability of the elimination of measles and rubella continues to be high on the agenda for the Expanded Programme on Immunization (EPI) in Dominica, especially with the threat of new and re-emerging diseases. Also high on the EPI annual work plan is an emphasis on surveillance for fever and rash illnesses and maintaining high immunization coverage of MMR vaccine. Immunization regulations have not yet been enacted into law; however the Education Act mandates that all children be adequately vaccinated prior to school entry. There is still not a separate line item in the budget for procurement of vaccines; however, in spite of occasional delays in receipt of vaccines, the EPI has been able to purchase required vaccines with little difficulty for payment. For cold chain and other items related to EPI supervision and surveillance, funding is provided through the national budget.

PROGRESS OF MEASLES, RUBELLA AND CRS ELIMINATION: Conclusions and Recommendations:

1. At the most recent PAHO Directing Council, all ministries of health throughout the Region of the Americas were recognized for their monumental achievement of the certification of measles and rubella elimination. Countries and territories are congratulated for their tremendous efforts within and between countries to document measles and rubella elimination.
2. Countries and territories are reminded to ensure consistent coverage of measles and rubella-containing vaccine (MRCV) vaccination above 95% at the national level and above 80% at the district level to sustain measles and rubella elimination since the Region continues to face risk of imported cases.
3. Those countries that have not done so already should implement the TAG recommendation for MMR2 vaccine to be given at 18 months of age. In doing so countries should conduct a catch up vaccination campaign for those aged 2-4 years and where needed do mop up immunization for those aged up to 10 years.
4. The elimination era of measles and the emergence of new infections that present with fever/rash call for an urgent strengthening of integrated surveillance of fever/rash to ensure timely and accurate detection of imported measles cases to halt the risk of subsequent secondary case transmission. Furthermore, countries should ensure close collaboration between the EPI programme and national epidemiology/surveillance unit.
5. Countries should improve efforts to achieve reporting of 2 fever/rash cases per 100,000 persons and submit samples to CARPHA in a timely manner.

4.6. Update on Hepatitis B vaccination in the Americas

According to a recent review¹, approximately 7.4 million people are living with chronic Hep B virus (HBV) infection in the Americas, and the regional average of HBV seroprevalence is 0.81%. However in highly endemic areas, such as the Amazon basin, the prevalence of HBV infection is over 8%. In regions of low endemic rates, including the United States and parts of South America, HBsAg prevalence is less than 2% and other areas in Latin America have intermediate prevalence (between 2% and 4%).

As of November, 2016, all 51 countries/territories have included infant HB vaccination in their official immunization schedule. Twenty countries, whose populations represent over 90% of the Region's births, have included nationwide newborn HB vaccination. We estimated the regional three-dose series and the birth dose HB vaccination coverage in 2015 to be at 89% and 75%, respectively². Not only is the 75% coverage for the birth dose in the regional birth cohort above the GVAP recommendation of 50% of the birth cohort vaccinated but also, the impact evaluations of infant HB immunization programmes in the Region have shown substantial reductions in HB surface antigen (HBsAg) seroprevalence.

In 2016, PAHO/WHO's TAG assessed the feasibility of eliminating mother-to-child transmission (MTCT) and early childhood transmission from all countries in the Americas by 2020, defined as reaching HBsAg seroprevalence of $\leq 0.1\%$ among children aged less than 5 years. The committee concluded that both eliminations would be feasible by ensuring 95% coverage for the third-dose among infants aged <1 year, and 95% coverage of timely birth dose vaccination.

References:

1. Schweitzer A, Horn J, Mikolajczyk RT, Krause G, Ott JJ, *Estimations of worldwide prevalence of chronic hepatitis B virus infection: a systematic review of data published between 1965 and 2013, Lancet*2015
2. WHO/UNICEF Joint Reporting Forms/Country Survey

4.7. Experience with routine birth dose of Hepatitis B- St. Kitts and Nevis

In 1985, a population based (6 months - 44 years) sero-prevalence survey among 100 households was conducted for Hepatitis B markers. The overall prevalence of Hepatitis B Virus (HBV) infection from the study was 61% in children. In 2011, the Ministry of Health (MOH), in collaboration with PAHO and CAREC, conducted a sero-prevalence study for Hepatitis B infection in pregnant women, since perinatal transmission and its sequelae have major impacts on infant morbidity and mortality. In this study, 317 respondents were interviewed in 25 health facilities in the twin islands, and 3.1% positivity for Hepatitis B Surface Antigen (HBsAg) was found; these findings informed changes to the immunization policy and schedule.

A plan of action was developed with necessary trainings and protocols for the implementation of a birth dose of Hepatitis B. Implementation included procurement of vaccines from the Revolving Fund, the purchase of two refrigerators for the neonatal units, training of nurses and health workers, and sensitization of target groups. In December 2015, a birth dose of recombinant Hepatitis B vaccine was re-introduced with inoculation given within 24 hours of birth. This is in-keeping with the PAHO/WHO's 2009 recommendations for a Hepatitis B vaccination schedule in an intermediate/moderate endemic zone. As of September 2016, there have been 524 births in St Kitts and Nevis, of which 516 were given birth dose Hepatitis B within 24 hours of birth. The vaccine was delayed in newborns who did not receive the birth dose within 24 hours mainly due to prematurity. To date there has been 100% acceptance of the vaccine and the reintroduction of the Hepatitis B birth dose was featured in the Global Immunization Newsletter in April 2016.

UPDATE ON HEPATITIS B VACCINATION IN THE AMERICAS: Conclusions and Recommendations:

1. To ensure the elimination of mother to child transmission (MTCT) of hepatitis B, countries and territories in the Caribbean are encouraged to introduce a birth dose of Hepatitis B vaccine at birth or within 24 hours into the routine immunization programme, as recommended by TAG, if they do not already have such a policy.
2. When looking to introduce a birth dose of Hepatitis B, immunization programmes in the Caribbean should ensure that all maternal hospitals have vaccine available and the corresponding logistics in place to guarantee high coverage of the birth dose during the first 24 hours of life.
3. In addition, immunization programmes should adapt their information systems to accurately record coverage for the Hepatitis B birth dose in the first 24 hours of life.
4. In environments where it may not be feasible to administer the first dose of Hepatitis B within the first 24 hours such as with home births, it still is considered beneficial to administer a first Hepatitis B dose to prevent perinatal transmission within the first 7 days of life, although less effective than administering within 24 hours of life.

5. St. Kitts and Nevis is congratulated for the decision to introduce Hep B birth dose after review of evidence and well-planned implementation.

4.8. EPI Plan of Action- Use of the new tool

The annual EPI plan of action (PoA) is a managerial tool for programming and monitoring that helps immunization programmes prioritize their activities and achieve their objectives and goals in an efficient and timely way. Having a carefully crafted, detailed PoA can enable the implementation of activities on schedule that are consistent with the objectives and strategies of the overall immunization programme. A solid PoA can also help EPI Managers and their teams coordinate activities and stakeholders around common objectives, obtain and commit the necessary resources for a programme, and facilitate the monitoring and evaluation of progress. A PoA shouldn't only be completed as a requirement, but it should be seen as an aid to guide PAHO's work within a country, through the identification of needs for technical cooperation and support.

The importance of EPI planning has been underlined in both global and regional policy documents, including the Regional Immunization Action Plan (RIAP). The RIAP was endorsed by all ministers of health in the Region during PAHO's Directing Council in September 2015 and is now the guiding policy document for immunization programmes in the Americas.

EPI planning should ideally follow a cyclical process, starting with completing an immunization-related situational analysis. Subsequent steps include, defining priorities for the EPI programme over the coming year; formulating objectives and goals; creating the actual plan; implementing the prescribed activities, monitoring and supervision of said activities and evaluating progress achieved. The extent to which what was planned actually occurred during the year can then serve to help inform the planning process for the following year.

EPI planning throughout the Region is now being done using an Excel template. The template has sections to be filled out that include 12 components of work, including 1. Political priority and legal frameworks; 2. Planning and coordination; 3. Biologicals and supplies; 4. Cold chain; 5. Training; 6. Communication and social mobilization; 7. Operating costs; 8. Supervision and monitoring; 9. Epidemiological surveillance and lab; 10. Information systems; 11. Research and 12. Evaluation. The template also provides reference sections with standardized definitions and examples, as well as 3 consolidated summary sections of budgets and graphs, for reference, which are automatically generated.

PLANS OF ACTION ON IMMUNIZATION: Conclusions and Recommendations:

1. The annual EPI plan of action should be used as an essential managerial tool to aide countries in prioritizing key immunization objectives and strategies, committing the necessary resources and implementing activities in a timely way.
2. Countries are encouraged to develop multiyear EPI Plans of Action that include annual implementation plans, with a focus on the first year.

5. SUSTAINING POLIO ERADICATION

5.1. Update on Global Polio Eradication and Endgame Strategic Plan with emphasis on the switch

Tremendous progress has been made towards the global polio eradication goal. This year, the fewest ever polio cases have been reported; 32 cases were reported as of 9 November 2016, compared to 52 cases in the same timeframe in 2015.

In 2015, Nigeria was removed from the list of endemic countries. However, in 2016 four new WPV1 cases were reported in Nigeria and the investigations indicated that there was silent transmission of the virus for over two years. Currently a regional outbreak response is being implemented in Nigeria and its neighboring countries. This is an important reminder that the world cannot afford to be complacent as we are on the brink of polio eradication. Until the whole world is free from polio, all countries must achieve and maintain high polio vaccination coverage and an adequate acute flaccid paralysis (AFP) surveillance system to detect and rapidly respond to any outbreak.

As part of the Global Polio Eradication and Endgame Strategic Plan, countries in the PAHO region have introduced the inactivated poliovirus vaccine (IPV) into their routine immunization schedule, switched from trivalent to bivalent oral poliovirus vaccine, and have been working on the containment of all wild and vaccine-related polioviruses (discussed in more detail in the following section on containment).

In the PAHO Region, 19 countries and territories, representing 70% of the birth cohort in the Americas, were already using the IPV vaccine in their national schedule prior to 2015. The remaining 32 countries, representing 30% of the birth cohort in the Americas (4,606,700), introduced IPV as part of the Endgame Plan, between 2015 (22 countries) and the first half of 2016 (10 countries). Of the 32 countries that introduced IPV in 2015, 18 were from the Caribbean: Anguilla, Antigua and Barbuda, Bahamas, Barbados, Belize, Curacao, Dominica, Grenada, Guyana, Jamaica, Montserrat, Saint Kitts & Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, Trinidad and Tobago, Turks and Caicos Islands, Virgin Islands (UK). 16 of the Caribbean countries introduced IPV in the second semester of 2015, and 2 countries introduced in January 2016.

Between 17 April and 1 May 2016, 36 countries in the Americas, participated in the global switch from the trivalent oral polio vaccine (tOPV) to the bivalent oral polio vaccine (bOPV). Of the 36 countries that participated in the switch, 18 were from the Caribbean (same 18 as listed above), and 16 of these countries decided to join together and do a Sub-Regional Caribbean Switch Day, all switching together on 26 April. Belize and Curacao switched a day prior on April 25th.

Following the GPEI recommendations, in the two week period post-switch, every country did independent monitoring of the switch, visiting at least 10% of all health facilities and 100% of warehouses to ensure that no tOPV vial was left in the cold chain. In the 3 months following the switch, countries continued to supervise 100% of all vaccination service points across the country to ensure that every last health centre had correctly withdrawn tOPV and was using bOPV.

Each country submitted a national switch report. All 18 reports from the Caribbean were reviewed by the Caribbean Sub-regional Certification Committee (SCC), and then by the Regional Certification Commission (RCC), and all 18 were accepted.

For the revision of the final switch reports, the RCC considered the following essential information:

- Signature of the country
- Validation of the report by the NCC/SCC with signature
- 100% of warehouses supervised
- 100% of the vaccination services supervised

- Verification that all leftover tOPV were destroyed

The RCC concluded that all of the Caribbean reports contained the essential information and requested additional information from four of these countries (Bahamas, Montserrat, Suriname, and Trinidad and Tobago), which was subsequently provided.

The synchronized introduction of the Inactivated Polio Vaccine (IPV) and the switch from trivalent Oral Polio Vaccine (tOPV) to bivalent Oral Polio Vaccine (bOPV) have constituted an effort without precedents, and with astonishing results. Within the established timeframe, all countries in our Region managed to carry out the decision, planning and introduction of this vaccine and subsequent switch to their national immunization schedules.

Outbreak Response Preparedness

As a result of the withdrawal of OPV2, between 17 April and 1 May 2016, there will be a gradual decline of population immunity, especially intestinal immunity to the type 2 virus thus increasing the risk of an outbreak following exposure to the type 2 poliovirus. Therefore, the detection of any type 2 poliovirus (wild, vaccine-derived or Sabin) in any sample of any origin is considered a global public health emergency, warranting a rapid and coordinated response, at international, national and subnational levels. At least one cVDPV2 and several VDPV2 cases are likely to emerge within 12 months of the global switch from tOPV to bOPV.

A critical factor to the successful eradication of polio is ensuring a rapid and effective response to type 2 poliovirus, as well as types 1 and 3, following virus importation, reintroduction due to containment breaches, or VDPV emergence. Therefore, all countries should prepare or update their polio outbreak or event response plan.

The World Health Organization (WHO) has drawn up some standard operating procedures (SOPs) to guide countries in developing their respective plans on how to respond to a poliovirus event or outbreak. The Pan American Health Organization (PAHO/WHO) has prepared a simplified version of this document to cover all key elements to be considered in such a response plan. In order to provide a rapid and effective response to a polio event or outbreak, some activities must already be prepared before any such event or outbreak is detected.

This document is available [here](#) at the PAHO Immunization polio webpage.

AFP Surveillance in the Americas

Since we are currently in the first year following the switch from tOPV to bOPV, there is a relatively higher, but time-limited, risk of the emergence of cVDPV type 2, and a lower, but long term risk of poliovirus re-introduction from a manufacturing site or laboratory. For these reasons, all countries must maintain sensitive surveillance systems in order to rapidly detect and interrupt any circulating poliovirus

AFP surveillance continues to be the priority mechanism for the detection of poliovirus circulation. Environmental surveillance can complement AFP surveillance in selected areas based on risk criteria, and is recommended for high risk countries, which in this region is only Haiti.

Polio 3 Coverage in the Americas

Regional vaccination coverage against polio reached 92% in the Americas. However, there are notable coverage differences between and within countries. PAHO is preparing a report on IPV

introduction in LAC, which will include the country and regional perspectives as well as lessons learned.

Global and Regional IPV Supply

Based on ensuing discussions, it was emphasized that the global level of commitment from countries to meet the IPV introduction timeline was exceptional. Out of 126 planned introductions, currently 105 countries have introduced IPV. However, unfortunately, the rapid scale-up of IPV production required has led to multiple challenges, and ultimately a global shortage.

To discuss the IPV supply shortage, PAHO called an ad-hoc TAG meeting on IPV supply, and issued the following recommendations:

1. Reduce IPV wastage
2. Prepare to respond an IPV shortage
3. Prepare to respond to polio outbreaks
4. Evaluate the capacity to use intradermal (ID) fractional IPV (fIPV)
5. Strengthen surveillance

Currently, the PAHO Revolving Fund (RF) procures most IPV through one manufacturer, Bilthoven Biological. This supplier has reduced the quantity of doses they can supply from 7 million to 5 million doses for 2017 and 2018. To meet the regional demand, the RF secured a limited quantity of pre-filled syringes from Sanofi. The supply situation will remain tight at least until 2019.

Fractional dose schedules

There is a growing body of scientific evidence on the safety and immunogenicity of intradermal (ID) fractional IPV (fIPV) dose administration, which delivers 0.1ml or 1/5 of the full intramuscular (IM) dose. Studies have been conducted for ID fIPV-dose as primary series in routine immunization schedules, as well as for boosting.

In March of this year, the WHO updated the Polio Position paper, which includes a recommendation to face the global IPV shortage, to recommend: *“As an alternative to the intramuscular injection of a full dose of IPV, countries may consider using fractional doses (1/5 of the full IPV dose) via the intradermal route, but the programmatic cost and logistic implications of this option should be considered. The SAGE working group in March 2016 confirmed that the proposed schedule of two ID fIPV can induce equal or better immunity than the current one full-dose schedule.”*

In the case of outbreak response, if IPV is needed, to preserve supply, it will be necessary to use ID fIPV.

5.2. AFP Surveillance in the Caribbean

Until the global eradication of wild poliovirus, the countries of the Caribbean remain at risk for importation of wild poliovirus and cVDPV. In keeping with the recommendations of the GPEI and the Polio Eradication and Endgame Strategic Plan 2013-2018, the Caribbean countries continue to make efforts to strengthen polio surveillance using the proxy condition of acute flaccid paralysis as well as increasing efforts to improve population immunity. The last confirmed polio case in the Caribbean sub-region was in 1982. Since then, efforts at improving polio vaccine coverage have continued, and in 2015 the coverage was 95% up from 94% in 2014 and 92% in 2013.

The objectives of the AFP surveillance for the Caribbean remained as follows:

- To achieve timely, complete, and effective surveillance for acute flaccid paralysis (AFP).
- To ensure all AFP Indicators are met in countries, at a level of at least 80% achievement
- To have a rate of detection of AFP cases in countries and the sub-region of at least 1.0/100,000 population <15 years

Annually, a total of some 20 AFP cases in the < 15-year population should be reported from the countries. In 2016 (up to Epi week 44), a total of 131 AFP cases were reported from only 7 countries (Figure 1). However, only 22, or 17%, were in children ≤ 15 years of age. This resulted in a case detection rate of 1.25 per 100,000 population < 15 years of age (Figure 2).

Fig 3: AFP cases reported 2012-2016 (EW 44)

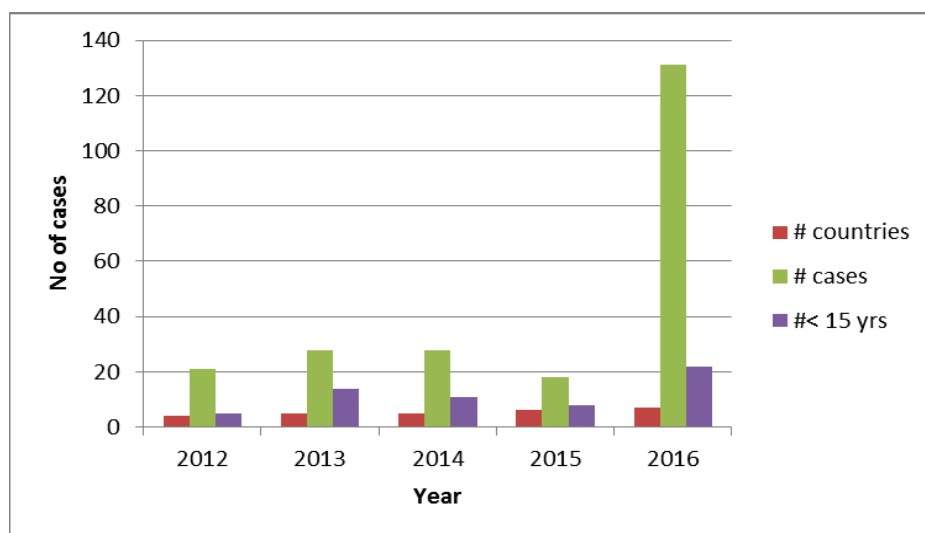
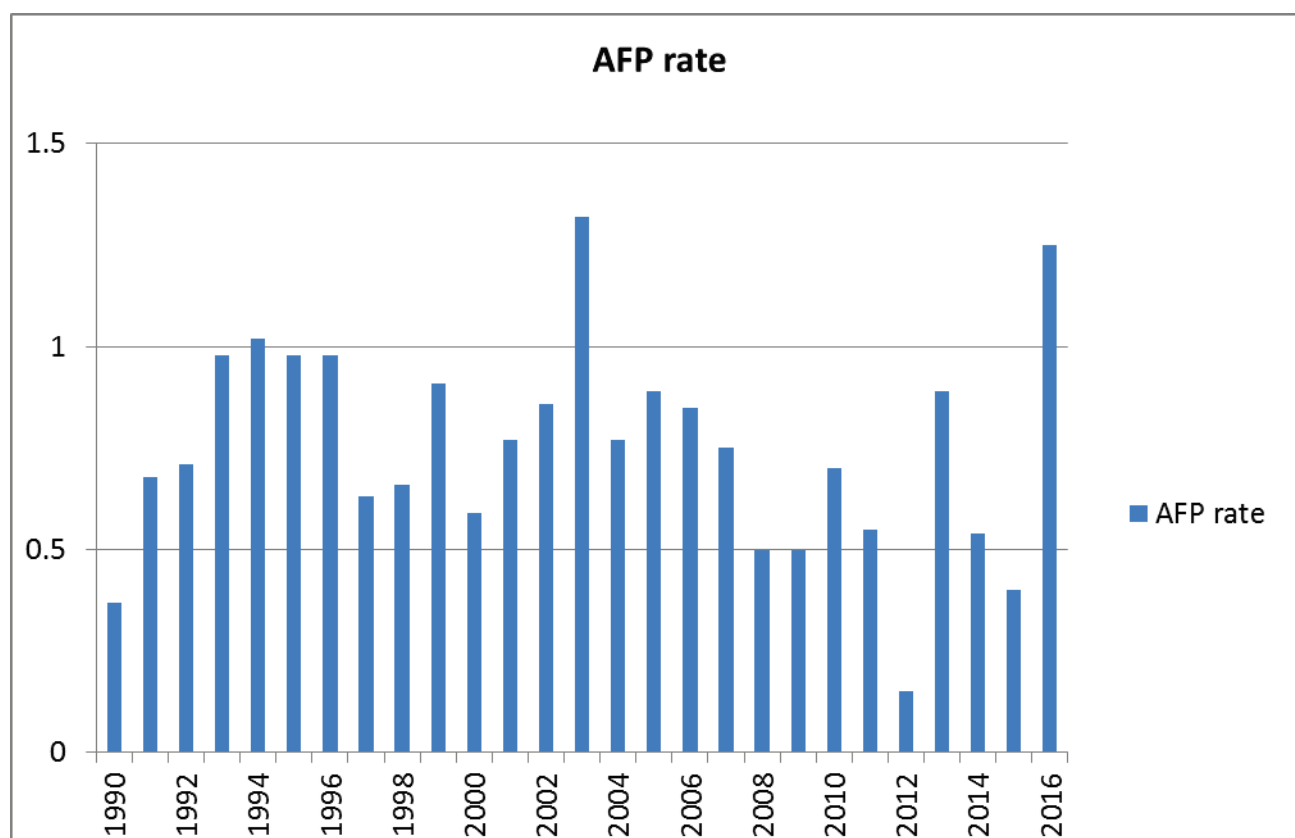
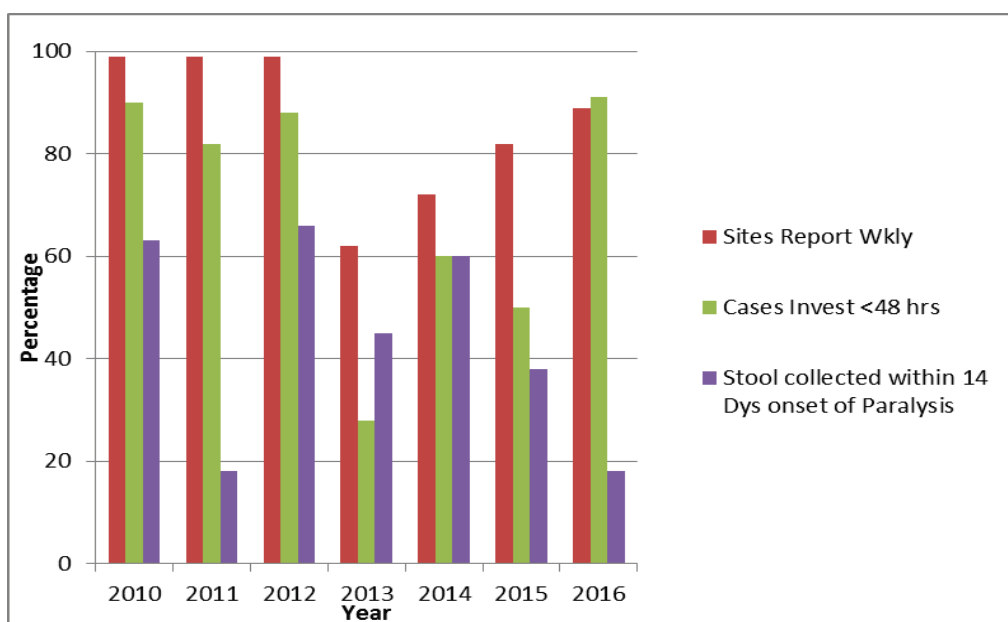


Fig 4: Rate of detection of AFP cases in the Caribbean Sub-region 1990-2016 (EW 44)



The quality of surveillance for AFP cases improved for timely reporting and investigation compared to previous years. In 2016 (wks1-44), 89% of the surveillance sites for AFP reported on time weekly, 91% of the cases were investigated within 48 hours but only 18% had stool samples submitted to CARPHA within 14 days of the onset of paralysis (Figure 3). The Zika virus outbreak challenged the surveillance system but despite this, no case of polio was confirmed in 2016 to date.

Fig 5 : AFP Surveillance Indicators, 2010-2016 (EW 44)



Polio vaccination coverage and surveillance has not met or sustained the required levels to ensure adequate protection of the population. Internal evaluation and validation of the AFP surveillance system needs to be done in each country to improve the surveillance indicators especially in light of the arbovirus infections, such as Zika.

5.3. Country Reports on AFP surveillance and indicators with reference to Zika virus outbreak

5.3.1. Barbados

Barbados reported 655 suspected cases of Zika virus with 30 cases confirmed. Of the 30 confirmed cases, 23 were among pregnant women. Currently there are four cases of GBS diagnosed in Barbados in 2016 compared to one each in 2014 and 2015. Of the four GBS cases, two had stool samples sent to CARPHA. Both stool samples were negative for polio virus, but one was positive for Zika virus. The other 3 GBS cases that were not confirmed for Zika virus were suspected to be due to Zika virus infection; however, GBS cannot confidently be linked to Zika virus infection in these cases due to sample collection not occurring in a timely manner. Sample collection remains one of the biggest challenges, primarily because most doctors do not usually collect samples, and nurses won't collect samples without a doctor's approval or presence.

5.3.2. Jamaica

The last case of poliomyelitis in Jamaica and the Caribbean was in 1982. AFP surveillance remains the gold standard for global polio eradication. In Jamaica, due to the Zika virus outbreak, AFP notification rates have increased significantly in 2016 as well as heightened surveillance since the awareness of the GBS/Zika connection. To date, there have been 197 lab confirmed Zika cases, with 77% being pregnant women; this is skewed due to biased or targeted sample collection. Additionally, there have been 146 notifications and 37 suspected cases of GBS as of November 18.

AFP surveillance indicators show that AFP notification rates in the population under 15 years of age have not been inflated relative to Jamaica's target in the face of the Zika epidemic. The main gaps and challenges identified for AFP surveillance were lack of timely case investigation, due to lack of case detection through the local surveillance system, specimen collection, due to issues with the clinical staff in terms of collection and knowledge of AFP sample collection, and 60 day follow-up for cases. Key strategies for the way forward are validation of AFP/GBS surveillance data and strengthening of local AFP surveillance.

5.3.3. Suriname

In previous years, Suriname had met the indicator of 1 case/100,000 persons <15 years for AFP surveillance. However, in 2015 and 2016, Suriname experienced an increase in suspect AFP cases, which were reported during the peak period of the Zika outbreak in Suriname.

The first confirmed case of Zika in Suriname was November 2015. Since then, suspected cases have been reported from all 10 districts. The RGD (regional health foundation), covering 8 out of 10 districts situated in the coastal area, reported from 47 clinics a total of 2253 cases of Zika in 2016. (in Dec 2015: 220 cases were reported). During the Zika outbreak, there was also an increase in suspected GBS cases. Some GBS cases were tested for Zika (PCR), and of those 4 tested positive in urine or serum. In order to confirm Zika virus infection, the Academic Hospital (AZP) lab runs PCR tests on serum up to day 7 after onset of symptoms and on urine up to day 21 after onset of symptoms. In 2015, the AZP lab received 477 requests for Zika virus confirmation, of which 93 were positive. Up to July 2016, the lab received more than 2653 Zika virus confirmation requests, of which 624 were positive. The main challenges of AFP surveillance in the time of Zika include underreporting of GBS cases, testing of all GBS cases for Zika virus, as well as timely reporting and difficulty of shipping samples to CARPHA.

5.4. Country Reports on tOPV to bOPV switch

5.4.1. Anguilla

In Anguilla, there is one national central vaccine storage facility in the country, and polio vaccine is distributed only through the public system. Prior to the switch, various activities took place, such as training of staff, sensitization of the public to IPV, development of a national polio switch plan, as well as inventory at 3 health centres for tOPV. In total, there were 4 unopened vials (80 doses) and 6 opened vials (<120 doses), and all tOPV were removed from the cold chain of the health centres and transferred to one central collection point. On the day of the switch, April 26th, the independent switch monitor visited the national central facility as well as 3 of the 5 health centres. No tOPV was found in the cold chain of these facilities. However 700 doses of tOPV were found outside the cold chain; bOPV and IPV were found in the cold chain of all facilities. On April 27th, 900 doses of tOPV were destroyed, followed by burial, and on June 8th, site visits were made to the two remaining health centres to confirm the absence of tOPV in the country. The final switch report was submitted to PAHO in May 2016 to confirm that Anguilla is no longer administering tOPV and no longer has tOPV stored in the cold chain.

5.4.2. British Virgin Islands

It is the goal of the Ministry of Health and BVI Health Services Authority, to promote and maintain optimum levels of health to its population, through prevention; hence the commitment to the switch from tOPV to bOPV. During the process, a national switch committee was established to plan, manage and oversee all activities necessary for the switch. Through this committee a national plan was created that involved sensitization of health staff, one to one sensitization for the public in health clinics, and the switch monitor evaluating the quantities,

packaging and labeling of the vaccines. Assessment of tOPV in the cold chain was performed by the switch monitor for Tortola and by nurses in the other health centres on other islands. The results of this assessment showed that all centres had tOPV stored outside the cold chain, and ultimately these 370 doses of tOPV were removed from the facilities throughout the territory and adequately destroyed. One week prior to the switch date, bOPV was distributed to the immunization centres, and by April 26, 2016, all tOPV was successfully removed from both public and private immunization centres throughout the islands.

5.4.3. Turks and Caicos (TCI)

The TCI is home to approximately 36,000 persons but attracts 1.3 million visitors annually, posing a great risk of importation of polioviruses from other regions throughout the world. The TCI accepted PAHO's recommendation in 2013 to switch from tOPV to bOPV, beginning with the introduction of two doses of IPV in June 2015 followed by the switch from tOPV to bOPV in April 2016. Switch activities occurred at five sites on four islands and included the training of switch monitors by the EPI manager a week before the switch was to occur. Each island site had its own switch monitor as this was more cost-effective than using one monitor to travel between islands. Other activities included: (1) development and submission of the national switch plan, (2) development and submission of the national polio containment plan, (3) submission of survey on laboratories, (4) submission of the switch report and (5) submission of monthly dashboards for switch activities.

100% of the sites were visited by the national switch coordinator, and the 215 doses of tOPV found outside of the cold chain were removed and destroyed by burning. There were challenges in trying to destroy the tOPV as the incinerator was not working. After three attempts to incinerate the tOPV doses, the tOPV was burnt in a small, confined fire in a distant area of a dumpsite by the team, inclusive of the Director of Environmental Health and his team member, the dump site manager and the Senior Public Health Nurse. The burning was observed for one hour on the day of destruction to ensure that all of the tOPV was destroyed.

After the switch, initially the staff did not remember to give the first dose of polio vaccine as IPV, but that issue was short lived. The switch was well accepted; we await the approval of a pre-qualified Hexavalent vaccine to reduce the number of vaccines being administered in one visit to the infants. There was little wastage, however, the transition was short and we have accepted the new normal and now the TCI is ready for the next level.

5.5 Update on Polio Containment globally and regionally

The containment of wild and Sabin type 2 poliovirus is one of the objectives of the WHO's Polio Eradication and Endgame Strategic Plan 2013-2018. At the 68th World Health Assembly, Resolution WHA68.3 on Poliomyelitis called for Member States to implement appropriate containment of wild polioviruses following the global switch from trivalent oral polio vaccine (tOPV) to the bivalent oral polio vaccine (bOPV); type 2 wild poliovirus by the end of 2015, and Sabin 2 poliovirus within three months of the global switch.

Aligned with WHO's Global Action Plan for Polio Containment (GAPIII), the Regional Plan (which was shared in 2015) consists of three phases which relate to international polio eradication milestones: phase I, containment preparation (survey and inventory of facilities); phase II, poliovirus type 2 containment period; and phase III, final poliovirus containment.

PAHO designed a survey to capture information on tenure of wild, VDPV and Sabin type 2 poliovirus infectious materials and it has been used for most of the countries in the Region. Twenty-two countries and the Caribbean Sub-region (13 countries, 6 UK territories, and 3

associate member states) have submitted reports on the inventory of facilities with infectious or potentially infectious poliovirus materials and the designation of poliovirus essential facilities (PEFs).

- Advance of main activities of the Regional GAP-III
 - National survey includes infectious and potentially infectious materials of WPV/VDPV and OPV2/Sabin2
 - Inventory of national facilities for these materials
 - Presentation of country reports of poliovirus containment to RCC and PAHO

Currently, several countries have completed the inventory of facilities with infectious and potentially infectious materials of type 2 Sabin poliovirus, but have not defined the final disposal of these materials because they are waiting for WHO guidance's about risk classification of these materials to proceed accordingly.

The country and Sub-Regional reports have been reviewed and discussed at official Regional Certification Commission (RCC) meetings held in the Dominican Republic in March 2016 and in Washington DC in July 2016. Additionally, the RCC chair has sent letters to each country recognizing their efforts and providing recommendations to improve the country report. On December 5 and 6 of 2016, RCC members will meet again to review the updated reports on containment of WPV, VDPV and Sabin2 and to define next steps.

As of 31st October 2016, a total of 5 countries (Brazil, Canada, Cuba, Mexico and USA) had notified the RCC of the designation of 20 Poliovirus Essential Facilities (PEFs). Nomination of National Authority of Containment (NAC) has been done in four countries. In Phase II of the Global Action Plan for Poliovirus Containment (GAP III), all infectious materials should be contained in certified PEFs, according to WHO's Containment Certification Scheme that was recently published and available here <http://polioeradication.org/polio-today/preparing-for-a-polio-free-world/containment/containment-resources/>

GAP III Containment Certification Scheme (CCS) was endorsed by SAGE on October 2016. The CCS defines the containment certification process in three phases:

- Certificate of participation
- Interim Certificate of containment
- Certificate of containment

Next steps:

- Finalize Phase I of poliovirus containment in all countries in the Region of the Americas
- Countries with designated PEF will establish their National Authority for Containment (NAC)
- Development of a pool of GAP III experts/auditors to provide technical support
- Continue visits to the countries to support implementation of GAP III
- Advancement with implementation of the Containment Certification Scheme

PAHO will continue working with the countries of the Region of the Americas to finalize Phase I, move forward with Phase II and certification of PEFs, and consolidate the final containment of poliovirus as defined by the GAP III.

5.6. Country Reports on Polio Containment

5.6.1. Bermuda

In Bermuda, the last confirmed case of WPV was in 1970 and there are no confirmed cases of VDPV on record. The current national immunization schedule in Bermuda does not include OPV as procurement stopped in 2003, and currently includes 4 doses of IPV from the age of 2 months. A programme for AFP surveillance was implemented in 2006, with sentinel surveillance established at healthcare centres and labs; since this establishment, there have been no reports of AFP in the country. A National Committee for polio containment was established and a Coordinator of the Polio Containment Endgame Plan was appointed in 2015. 16 laboratory facilities were identified; 14 facilities, the majority private, were surveyed; and 12 surveys were returned. None of the 6 facilities that possessed a low temperature freezer, with the capacity for the conservation of biological samples at temperatures of -20°C or below, stored infectious WPV/VDPV materials. The Department of Health Clinical Laboratory had potentially infectious WPV/VDPV materials, as it was storing fecal and respiratory samples dating back to 2014. These samples were not suspected for Acute Flaccid Paralysis; however, it was decided to destroy the stored samples via autoclave and incineration. There are no essential WPV2 laboratories or polio vaccine production facilities in Bermuda. Therefore, it was determined by the National Committee that the risk of reintroducing facility-based wild and Sabin polioviruses to post eradication/post OPV /polio-free communities/ is very low in Bermuda.

5.6.2. Bahamas

The Bahamas is an island chain in the Atlantic Ocean and its main industry is tourism, which puts it at high risk for the re-introduction of polio, which has been eliminated or interrupted in the region. The population under 15 years is 77,076 and the polio coverage in children under < 1 year during 2011-2015 was between 95%-99%. The immunization schedule includes IPV at 2mos and 4mos, followed by OPV doses at 6mos and 4-5years. In regards to containment of polio, 3 hospitals with adequate freezer capability were identified, and none of them had polio infectious or potentially infectious materials stored.

The aim of the polio outbreak response plan is to

- Enable The Bahamas MOH to detect and respond appropriately to any environmental or circulating type 2 polio viruses in the population post OPV2 cessation
- Ensure that all stakeholders are knowledgeable of the plan
- Prepare a proper response notification and documentation of interruption

If a suspected case is identified, it will be reported immediately to the senior medical health officer responsible for surveillance, who will subsequently inform the CMO, who will inform the Minister of Health so that the information can be delivered to the Cabinet. The Emergency Operations Committee, which is a multidisciplinary team, will be activated by the CMO to plan strategies to control and reduce transmission of Polio in the country. Development of communication strategies will be planned and initiated to ensure that the media provide the community with accurate information. The government will also inform PAHO/WHO and IHR, and laboratory specimens will be sent to CARPHA. Polio containment activities will commence six months after the last confirmed case when the declaration of disease interruption is made, and there will be proper documentation of all activities that take place.

SUSTAINING POLIO ERADICATION: Conclusions and Recommendations:

1. Countries are to be commended for the smooth introduction of IPV vaccine, the successful switch from tOPV to bOPV vaccine, and completion of polio containment reports.
2. Considering the risk of importation, all countries should be prepared to detect and respond to poliovirus events or outbreaks. This preparation includes the elaboration of a national response plan and the completion of activities that need to be ready before an eventual detection of a poliovirus. Country plans should be completed by February 2017.
3. All countries should reach and maintain high polio vaccination coverage, > or equal to 95% at the national and district levels to avoid the circulation of poliovirus type 1 secondary to an importation and any emergence of VDPV.
4. It is critical that countries fulfill the acute flaccid paralysis (AFP) quality surveillance indicators in order to be able to respond rapidly to any detection of poliovirus.
5. Given the severe global shortage of IPV vaccine, there must be a special effort to avoid wasting IPV vaccine, including implementation of the 28 day open vial policy.
6. SAGE has reviewed the evidence, and concluded that 2 doses of intradermal (ID) IPV could potentially be equivalent or better than one IM dose of IPV in light of stock shortage of IPV. Should the Region face a stock shortage, countries that are willing and able to implement fIPV ID vaccination should let Dr. Karen Lewis-Bell know

6. PROGRAMME ACTIVITIES AND EXPERIENCES**6.1. Update on seasonal influenza vaccination in the Americas**

There has been considerable uptake of seasonal influenza vaccines in the Americas compared to other regions. We describe the current influenza vaccination target groups, recent progress in vaccine uptake and in generating evidence on influenza seasonality and vaccine effectiveness for immunization programmes.

Since 2008, 25 countries/territories in the Americas have introduced new target groups for vaccination or expanded the age ranges of existing target groups. As of 2014, 40 (89%) out of 45 countries/territories have policies established for seasonal influenza vaccination. Currently, 31 (69%) countries/territories target pregnant women for vaccination, the highest priority group according to WHO's Strategic Advisory Group of Experts and PAHO/WHO's Technical Advisory Group on Vaccine-preventable Diseases, compared to only 7 (16%) in 2008.

Among 23 countries reporting coverage data, on average, 75% of adults ≥60 years, 45% of children aged 6-23 months, 32% of children aged 2-5 years, 59% of pregnant women, 78% of healthcare workers, and 90% of individuals with chronic conditions were vaccinated during the 2013-14 Northern Hemisphere or 2014 Southern Hemisphere influenza seasons. Difficulties, however, persist in the estimation of vaccination coverage, especially for pregnant women and persons with chronic conditions. Since 2007, 6 tropical countries have changed their vaccine formulation from the Northern to the Southern Hemisphere formulation and the timing of their campaigns to April-May following the review of national evidence. LAC countries have also established an official network dedicated to evaluating influenza vaccine effectiveness and impact.

Following the A (H1N1) 2009 influenza pandemic, countries of the Americas have continued their efforts to sustain or increase seasonal influenza vaccine uptake among high risk groups, especially among pregnant women. Influenza vaccination is particularly challenging compared to other vaccines included in EPI schedules, due to the need for annual vaccines, vaccine matching to circulating virus types, optimally timed vaccination, the wide spectrum of target groups, and the limitations of the available vaccines. Furthermore, improvements should be

made in the quality of information gathered on coverage rates as well as proper calculation of denominators. Countries should continue to monitor influenza vaccination coverage, generate evidence for vaccination programmes and implement social communication strategies addressing existing challenges to the vaccine uptake.

While the Caribbean region has made progress in implementing and monitoring influenza vaccination, it still faces challenges to increase the acceptability and uptake of the vaccine in certain high risk groups, such as pregnant women and healthcare workers among others.

6.2. Communication strategies to improve influenza vaccination uptake

While there is proven success of the efficacy and safety of influenza vaccine, uptake of the vaccine remains low. There are many barriers that cause low uptake of the vaccine, including a lack of awareness of the recommendation to get vaccinated, beliefs that the influenza vaccine does not work or is not safe, beliefs that influenza is not serious or is “manageable”, and that other preventative measures are better, i.e. hand-washing or vitamins. It is best to talk to different groups to see their perceptions on influenza and influenza vaccine as people have different reasons for not receiving influenza vaccine. Facilitators of influenza vaccination need to communicate the severity of influenza as well as the safety and efficacy of the vaccine, which can be done by including data and stories in vaccine messaging. Studies have shown that, in the case of pregnant women, there is a big difference between vaccination rates when the healthcare worker provides the recommendation to get vaccinated. Furthermore, influenza vaccine uptake can be improved if people are more aware of the recommendation, especially those at high-risk, and have convenient and easy access to receiving the vaccine. When it comes to influenza prevention, a comprehensive strategy is recommended; in addition to getting the influenza vaccine, people should take preventative measures such as hand-washing and staying at home if sick to prevent further spread.

Key messages for influenza communication must convey the severity of influenza as well as the efficacy of the vaccine. The CDC recommends communication emphasis for those at high risk, such as pregnant women, elderly people, and those who are immunocompromised.

Communication should emphasize that influenza is serious, and not only can anyone get it, but there is also a high burden of illness. Additionally, influenza vaccine offers the best protection for those who are vaccinated as well as those who cannot get vaccinated i.e. newborns and those who are immunocompromised, and can reduce the severity of disease and risk of hospitalization, which is especially important for those with chronic conditions. Examples of influenza communication are on the CDC website and include marketing collateral, press releases, as well as ideas for social media communication.

6.3. Influenza outbreak and impact on vaccination

6.3.1. Trinidad and Tobago

During the 2014-2015 influenza season Trinidad and Tobago experienced a significant increase in reported morbidity and mortality due to the Influenza A (H1N1) strain. The media coverage of the confirmed deaths influenced the increased demand for the vaccine. From 2011-2014 there was about 50% utilization of the influenza vaccine, but during 2015-2016 the demand increased, leading to a stock out in early January 2016. Additional vaccines had to be procured from the revolving fund and some were loaned from other CARICOM neighbors. Through the media, as the awareness of the number of laboratory confirmed cases and deaths due to the Influenza A (H1N1) strain increased, the number of Influenza vaccines administered also increased. This outbreak highlighted challenges that were present before the outbreak, such as vaccine hesitancy and difficulty in obtaining nasopharyngeal specimen , as well as new challenges, such

as the impact of media coverage and the changing of vaccination criteria due to limited vaccine supply. The Minister of Health has requested an increased procurement of influenza vaccines for the 2016-2017 season, and there are further plans to designate two days during the week to administer influenza vaccine to high-risk groups during the upcoming influenza season.

6.3.2. Jamaica

In Jamaica, seasonal influenza activity often begins to increase in October to November, peaks between December to March, and can last as late as May. During the 2015-2016 influenza season the reported SARI cases peaked in the latter part of the flu season. Only 3400 doses of influenza vaccine had been purchased, given Jamaica's historically low uptake. However, the increase in the number of reported cases of H1N1 influenza was associated with an upsurge in demand for the flu vaccine, and an additional 7150 doses had to be procured in February and March.

In preparation for the 2016-2017 flu season, several actions were taken at the national level including: revision of the National Plan of Action for Influenza Vaccination; increasing the influenza vaccine supply to over 20,000 doses; drafting a Healthcare Worker Vaccination Policy; and conducting multiple public awareness activities identifying and targeting healthcare workers, various other high risk groups, and the general population.

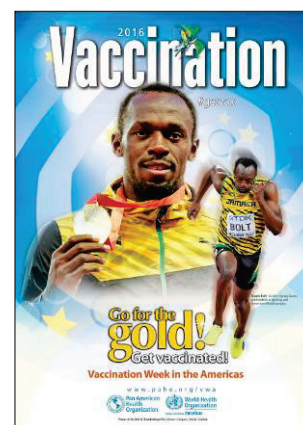
UPDATE ON SEASONAL INFLUENZA VACCINATION IN THE AMERICAS:

Conclusions and Recommendations:

1. Caribbean countries/territories should conduct operational research such as Knowledge Practices and Attitudes studies among healthcare workers as well as communication studies addressing the obstacles to vaccinate high risk groups against seasonal influenza. A more thorough understanding of the gaps in communication and barriers to influenza vaccination, especially among high risk groups, would help design tailor-made strategies to reach those groups.
2. The current reporting of vaccination coverage through the WHO/UNICEF joint reporting form on immunization presents an opportunity to better define targeted groups as well as their corresponding population denominators. The official information reported to PAHO/WHO that is based on the existing information systems does not reflect the wide efforts undertaken by EPI teams across the Caribbean. Thus countries/territories may consider revising the information systems to allow for more precise data collection and sharing.

6.4. Overview of Vaccination Week in the Americas

The 14th celebration of Vaccination Week in the Americas (VWA) was held from 23-30 April 2016 under an Olympic theme and the slogan of "Go for the Gold! Get Vaccinated!" Countries and territories from across the Region of the Americas raised awareness on the importance of immunization and implemented a diverse array of vaccination efforts. More than 55 million individuals were vaccinated under the umbrella of VWA this year, totaling to more than 640 million individuals vaccinated since VWA's creation in 2003. However, these numbers only tell part of the success of VWA. Countries also use VWA to make a particular effort to promote vaccines and to vaccinate specific population groups living in areas that are difficult to access. The main messages around this year's slogan reinforced the idea that everyday people can "go for the gold", like Olympic athletes, by being team players and getting vaccinated. A widespread social media campaign using the



#GetVax and **#GoForTheGold** hashtags encouraged people to take photos holding #GetVax signs and post them to social media or submit them to PAHO's website. Submitted photos can be viewed at: <http://bit.ly/1RXGILU>.

Jamaican sprinter Usain Bolt, who holds 15 Olympic gold medals and 11 world championships, supported VWA 2016, appearing in PAHO-produced promotional materials, such as posters, social media messages, and in a PSA, in which he told viewers, "I'm up to date on my vaccines. Are you?". Bolt also promoted the initiative from his own Facebook and Twitter accounts, reaching more than 19 million and 4 million followers, respectively. Usain Bolt's PSA can be viewed here: <https://www.youtube.com/watch?v=x2KYu72TIEk>.



The Regional launch was celebrated this year on 23 April in Kingston, Jamaica at the Emancipation Park, with the participation of national health authorities, partner agencies and regional PAHO staff, including the PAHO Director, Dr. Carissa F. Etienne. One of the highlights of the ceremony was the Rousseau Primary School performing a very creative and original song and dance about vaccination using the "Go for the Gold!" theme. The video can be viewed [here](#).

This year, VWA coincided with the timeframe for the global switch from trivalent to bivalent oral poliovirus vaccine; therefore, switch activities were the primary focus of this year's VWA efforts throughout the Caribbean. Additional activities included:

- Mop up vaccination of children to complete schedules
- Public education and awareness on the importance of vaccination
- Training sessions for health care workers
- HPV vaccine-related activities
- Vaccination to protect occupational health
- Integration of other public health interventions with vaccination

The VWA 2016 regional video can be viewed here:

<https://www.youtube.com/watch?v=LqiMSJCluhc>

The next celebration of VWA will be held from 22 to 29 April, 2017. This will be the 15th anniversary of VWA and will coincide with the celebration of 40 years of the Expanded Programme on Immunization. The theme will be celebration, and the slogan will be "Let's celebrate! Get vaccinated!" Campaign materials will be designed to look like it is a birthday party celebration.

6.5. Country reports on Vaccination Week in the Americas

6.5.1. Cayman

The Cayman Islands joined with PAHO Member states in observance of VWA, April 23-30, 2016. Activities focused on 3 main objectives: Promoting access and equity in immunization, keeping immunization on the national agenda and improved VPD awareness and immunization coverage.

In order to promote access and equity in immunization, the immunization policy was revised through advocacy, making vaccines free of cost to all children regardless of immigration status. Immunization was kept on the national agenda by drawing attention to immunization through print and electronic media releases, radio interviews and newspaper inserts. Examples of promotional activities included printing of the immunization schedule in the newspaper, a press release to launch VWA, and education sessions in schools with participating kids receiving

pencils and rulers. In addition to keeping immunization a national priority, efforts were made to increase VPD awareness as well as immunization coverage. Special clinics were held to target dropouts and international travelers, VWA posters were mounted in both public and private immunization centres, and workshops were held for healthcare workers focusing on topics such as making vaccines more accessible to children < 5 years old as well as VPD surveillance and vaccination across the lifespan. A big challenge in the Cayman Islands in terms of vaccination is due to the movement of people, whether it be between districts or between countries resulting from a change in immigration status. In order to address this issue, strategies were developed that increased the sharing of information among health districts, identifying hard to reach and drop out populations, and strengthening relationships between the public and private health sectors.

6.5.2. Montserrat

Montserrat celebrated VWA with the following objectives:

- To promote equity and access to immunization
- To promote the transition from child to family immunization
- To maintain immunization on the political agenda to get all the ministers involved
- To serve as a platform for integrated activities

With this in mind, much focus was placed on social communication activities, such as education of the public through radio programmes, radio spots and open days at the clinics. Staff attended church together to share a moment of fellowship, and also had the opportunity to share information with the public and the rest of the world through the radio with live broadcasts and vaccination quizzes. All health centres scheduled open days which were used to educate and immunize clients.

This year the highlight of vaccination week was the switch from tOPV to bOPV on Tuesday 26th April 2016. In preparation for this grand occasion, education programmes were launched for staff and the public was sensitized about the changes in the Immunization Programme. The health staff was trained, the recalled tOPV was incinerated, and the introduction of bOPV immediately took effect after the previous mentioned events; the media was also present during this time of activities

This year, the mop-up vaccination campaign for the public was done with special emphasis on target groups that included athletes, cricketers (especially those selected to proceed on tour with the Leeward Islands under 15, 17 and 19 teams and West Indies under 15 team), Ministers of Government, Parliamentary Secretaries, Directors and Permanent Secretaries. Yellow Fever and other vaccines (Hep B, MMR, and DT) were given to ensure that the population was fully immunized against vaccine preventable diseases.

Lessons learnt:

- The public was very supportive of the programme.
- They were eager to learn more about the vaccines and how they work and congratulated the staff on the success of the programme
- Training and retraining of Health Staff should be done regularly as staff transfers from Hospital take place periodically.
- Montserrat should continue to plan and implement programmes to highlight the success of EPI

6.5.3. St. Maarten

In commemoration of 2016 Vaccination Week in the Americas St. Maarten had two main community outreach activities: a bike-a-thon with 36 participants held on Saturday, May 28, 2016 and an open house with 74 clients on Saturday, June 2, 2016. The goal of the second annual bike-a-thon was to promote the importance of physical activity among children in primary school grades 4 and 5. The goal of the open house was to vaccinate children 0-17 years old who were not up to date with their vaccinations according to St. Maarten's immunization programme as well as immunize young girls with HPV vaccine.

Other activities during the open house were vision screening (38 children, 8 adults), health information sessions on the prevention of cervical cancer and the HPV vaccine as well as on puberty and reproductive health. With help of the stakeholders, St. Maarten's National Social and Health Insurance Company (SZV), the American University of the Caribbean School of Medicine and volunteers, both activities were a success.

The 2016 VWA activities were promoted via posters, radio interviews, flyers, and digital billboards. Promotional items were also distributed, such as reusable water bottles, donated by SZV, t-shirts with the VWA slogan were distributed, as well as stickers for children who were vaccinated during vaccination week.

OVERVIEW OF VACCINATION WEEK IN THE AMERICAS: Conclusions and Recommendations:

1. Countries should continue to support VWA as a yearly opportunity to "reach the unreached" with vaccination, to highlight the work of the EPI in the media and to place immunization on the forefront of political agendas.
2. Countries in the Caribbean have led the charge in integrating other preventative interventions with immunization as part of VWA and these efforts should be continued when applicable.

7. DATA QUALITY, COLD CHAIN and PROGRAMME MANAGEMENT

7.1. Update on PAHO EPI Revolving Fund

The PAHO Revolving Fund (RF) for EPI continues to provide timely access to WHO prequalified vaccines at the lowest price for national immunization programmes of participating countries in Latin America and the Caribbean. Meeting participants received an update on the vaccine market and supply; a review of the key PAHO Directing Council Resolutions on the RF with reference to the collection of the additional 1.25% fee from countries and the corresponding enabling functions outlining the utilization of these resources; the proposed RF Assessment in 2017; and most importantly the challenging financial situation currently facing the RF outlined by country arrears during the period March to November 2016. Meeting participants also watched a video address by Dr. Carissa Etienne, Director, PAHO at the Developing Country Manufacturers Network Meeting (DCVMN) in Argentina, October 2017.

Feedback on the four RF recommendations from the 2015 Report impacting the efficiency of the RF was provided. The first two of the 4 recommendations were scheduled for completion with the workshop planned for 1 December. The two remaining recommendations were deferred to 2017. The recommendations were as follows:

1. Roll out of country demand forecasting workshops

2. Roll out of training plan for transition to AD syringes in 2018
3. Revitalization of RF IT platform (data warehouse & dashboard)
4. Operational assessment of the RF with a view toward creating more value for countries

Annual immunization plans and accurate vaccine demand forecasts at a national level were emphasized as key components to ensure timely supply and securing national financing to meet the estimated costs for vaccines, syringes and cold chain equipment offered through the RF. In summary, it was anticipated that the demand forecasting workshop planned for 1 December would help to improve accuracy of demand of vaccines and syringes, but more needs to be done to correct the chronic delays in timely payments to the RF across the Caribbean.

UPDATE ON PAHO EPI REVOLVING FUND: Conclusions and Recommendations:

1. The Caribbean welcomes the PAHO Revolving Fund's efforts to negotiate lower prices for pneumococcal vaccines.
2. The accuracy of country vaccine projections should be monitored, and training should be provided on topics including country demand forecasting and training for the transition to AD syringes in 2018.
3. Serious concern was expressed regarding the large number of countries owing money to the Revolving Fund for vaccines, including arrears exceeding 60 days. Dominica and Bermuda were the only two countries fully up to date with payments. The Revolving Fund is critical to the success of the EPI programme in the Americas and having so many countries owing significant funds could undermine its viability. Efforts should be made to reduce the number of countries in arrears with the Revolving Fund.

7.2. Update on the Electronic Immunization Registry - Grenada

In 2015 Grenada was successful in receiving a CDC grant of \$49,000 US to implement an Electronic Immunization Registry, with funds having to be used by December, 2015. A web based Grenada Immunization Information System (GIIS) developed by a company from Albania was created and delivered by the developers on September 30th. The system has several interesting features which will lead to improvement in the overall immunization programme in terms of accuracy and quality. A number of preparatory activities were undertaken before the software was implemented in selected locations including sensitization of administrative staff and other personnel in both public and private health sector, preparation and distribution of promotional materials, entry and verification of back-dated data for 2012 – 2014 and the training of end users, 84 of whom were issued with passwords to access the system. Another critical aspect was the provision of computers and internet access to the facilities selected for the rollout.

In January 2016, the system was rolled out at the General Hospital in collaboration with the Bedside Registration initiative, where the registration of newborns is conducted. To date, the system has been implemented in 6 Health Centres and 3 hospitals, and the entry of records for the year 2015 has been done by staff of the IT Unit and data verification is now 95% complete. User Manuals have been prepared and distributed to users in the public and private facilities. Most users have developed competency in using the system, which they remarked is facilitating the tracking of defaulters, updating vaccine data without having to contact other facilities, and readily accessing birth data from the hospitals to populate manual Registers. The provision of computers and internet access for the remaining facilities is expected to be undertaken by the first quarter in 2017. There are also plans for the training/sensitization of new staff and nursing assistants and distribution of a step by step video tutorial developed by the MIS Officer to all users of the system. A follow-up meeting to bring together users and stakeholders to discuss

issues and challenges experienced thus far will be conducted by year end or early 2017, and there will be quarterly visits to each facility (public and private), to ensure that all users are comfortable with the system and that data is being properly updated. Renewal of the SSL Certificate for the EIR is another critical undertaking for its sustainability which is assured, despite some teething challenges. A short demonstration of the GIS was done for participants.

UPDATE ON ELECTRONIC IMMUNIZATION REGISTRY: Conclusions and Recommendations

1. The meeting welcomed the update of the EIR in Grenada and assessed the system as highly suitable and user friendly; Countries and PAHO should continue documenting and exchanging experiences on the development and implementation of electronic immunization registries.
2. Countries transitioning from a paper-based individualized vaccination registry to an EIR system should keep in mind that this process takes time, needs to be carefully planned and adequately funded. Furthermore, to transition from a paper-based system to an online/offline system that successfully eliminates paper records requires technical, legal, and regulatory support.
3. Countries should consider monitoring and evaluation of data quality as indispensable for the successful operation of an EIR system. It is important to consider the whole information system cycle, this way the sustainability of the system is guaranteed.
4. A need was identified by other countries for an EIR system; however, countries should consider the coordination and interoperability of an Electronic Immunization Registry with other agencies and with other information systems prior to implementation. EIRs should be framed within the national eHealth strategy and policy

7.3. Cold Chain assessment and training – St. Kitts and Nevis

Recently, in 2015, there has been a further expansion of the routine immunization schedule with the introduction of Hepatitis B birth dose and IPV vaccines. Additionally, other vaccines, such as HPV, are forecasted for introduction in the near future. Maintenance of the cold chain system is an essential function of the immunization programme to ensure the delivery of potent vaccines to targeted recipients. It was therefore necessary to assess the storage capacity for vaccines, logistics at vaccine service points and the central storage facility that will safeguard adequate functionality. Hence, technical assistance from PAHO was requested to facilitate the process.

- 3 key elements were assessed as follows:
 - trained personnel
 - efficient vaccine management
 - proper storage and transport of vaccines

The assessment was conducted during 17-20th May 2016 by Mr. Victor Gomez. Site visits were made to the National Central Vaccine storage facility, two regional warehouses and 23 service points; 15 and 8, in St. Kitts and Nevis respectively. The findings revealed regional and local levels of cold chain equipment available at all health centres as well as the standardized monitoring and evaluation mechanisms in place. There was, however, inadequate storage capacity at the central level with a recommendation to purchase a walk-in cooler. Other recommendations included procurement of two refrigerators at the local level, training for new workers, and an update of cold chain management for other staff members. Since the assessment, the procurement of 2 refrigerators has been achieved.

In response to a request for further technical assistance from PAHO, a 2 day training session was conducted for nurses and other vaccine handling practitioners on 14th-15th September

2016. The workshop was facilitated by Dr. Karen Lewis Bell, Sub Regional Advisor for Immunization, and the methodology of the workshop included a pre- and post- test of cold chain logistics. Didactic sessions on cold chain components included “Management of vaccine stock” and “Vaccine storage and transportation”. A WEBEX presentation on Effective Vaccine Management was facilitated by Ms. Nora Rodriguez, PAHO-Washington D.C. The training activity concluded with site visits to a regional vaccine warehouse and service point in St Kitts, as well as the central Vaccine Central unit.

7.4. MMR Vaccination Coverage Survey

7.4.1. Barbados

Routine measurement of coverage in Barbados is conducted using administrative data collected monthly from polyclinics and private physicians’ offices. Using this data, vaccine coverage in Barbados ranged from lows of 87% for diphtheria, pertussis and tetanus in 2012 to highs of 98% for diphtheria, pertussis and tetanus, hepatitis B, haemophilus influenzae type b and poliomyelitis in 2015. Verification of the reported coverage is necessary to identify gaps in the immunization programme or the reporting system, and consequently develop interventions to either strengthen the EPI surveillance or plan activities to reach immunization defaulters. The last coverage survey was conducted in 2009; therefore another was due to confirm the trends seen in administrative data.

From December 2015 to January 2016 a 2-phase survey was administered to validate the coverage of MMR as well as to identify those who were immunized later than the recommended schedule. Phase 1 was a community survey examining vaccination of 1 year old infants in the community, and phase 2 was a school survey examining vaccination status in schools of 5 year old children. During phase 1, a sample of 30 districts were chosen in which retired nurses visited houses in the selected districts, and transcribed the immunization booklets of children in the household. A total of 340 immunization booklets were transcribed, and the results showed that MMR1 coverage was 93.8%; however, there was a delay in MMR1 vaccination in about 10% of cases. During phase 2, 30 primary schools were randomly selected and, similar to phase 1, retired nurses randomly selected one class per school from which to transcribe the students’ immunization booklets. Once again, 340 immunization booklets were transcribed, and it was found that there was almost 100% coverage for MMR vaccine given at 1 year, and 97% coverage for MMR2, with about 20% of children having a delay in MMR2 vaccination.

7.4.2. St. Lucia

The Ministry of Health in collaboration with PAHO conducted a Measles Mumps Rubella (MMR) vaccination coverage Survey in 2015. The aim was to determine the level of immunity against measles and rubella among children born during the years 2004 to 2009 through the assessment of the coverage of MMR1 and MMR2, with the goal of ensuring all children in St. Lucia received the two doses of MMR. A total of 836 students were randomly selected from 86 schools, both public and private, on the island. Two students per grade were selected in each infant, primary and combined school and two students at each special needs schools.

The survey was twofold. A school questionnaire was administered to the principals of all the schools and a household questionnaire administered to parents of selected students to determine their knowledge, attitudes and practices with respect to vaccination. All principals or their designate responded to the questionnaire with 97.7% stating that vaccines were important, however only 54% felt vaccines were safe and 48.8% were unaware of the law requiring full immunization prior to school entry. Only 30% kept copies of vaccine records of children at the school.

767 of the 836 household questionnaires were successfully completed. 92% percent used the public facilities for immunization services, and verification of children's health cards revealed an MMR1 coverage of 94.5% and MMR2 coverage of 75.9%. 73% percent received MMR1 at 12 months and coverage reached 91% by 24 months. At age 5, MMR2 coverage was less than 50%, with 78% of children receiving MMR2 late. Some factors associated with late or incomplete vaccination include inability to verify the vaccination status of the child and unwillingness of healthcare workers to open a multi-dose vial for 1 or 2 children. Administratively MMR1 and MMR2 coverage on average was reported as 99% and 72% respectively. The Ministry of Health with the collaboration of other Ministries and departments will identify strategies at improving the coverage and timeliness of MMR and other vaccines in the schedule.

MMR VACCINATION COVERAGE SURVEY: Conclusions and RECOMMENDATIONS:

1. The meeting welcomed conduct of coverage and knowledge awareness surveys in select countries. The findings indicate that there is no place for complacency regarding the need to promote the value of vaccines and their safety, as well as to address vaccine hesitancy. This is a specific topic worthy of inclusion in future meetings and other countries are encouraged to conduct similar surveys.

7.5. Sero-surveillance for vaccine-preventable diseases

Sero-surveillance is a means to better understand population immunity, and subsequently evaluate national immunization programmes. Examples of sample collection in sero-surveillance studies include blood samples to measure antibodies, fecal samples to examine the microbiome or antibiotic resistance, and nose and throat swabs to look for carriage of pathogens. In the Dutch general population, the seroprevalence of National Immunization Programme (NIP)-targeted diseases is periodically monitored by national sero-epidemiological studies in order to obtain insight into the age-specific seroprevalence of NIP-targeted diseases. The first study was performed in 1995-1996 (n=9948) and the second in 2006-2007 (n=7904).

In February 2016, the third population-based cross-sectional sero-epidemiological study started. Age strata were 0, 1-4, 5-9 up to 85-89 years of age. As in the two previous studies, a blood sample and a questionnaire is collected from each participant, but new in this serosurvey is the option for participants to take part in additional research. For this additional research, participants are asked to optionally donate nasopharyngeal and oropharyngeal swabs, an oral fluid sample, a fecal sample and to fill in an additional questionnaire. These samples will be used for microbiome investigations and examination of antibiotic resistance. The survey will continue until the end of 2017. In May 2017, a serosurvey will also be executed in the Dutch Caribbean islands, to measure the seroprevalence of NIP-targeted diseases and other infectious diseases.

8. NEW VACCINES

8.1. Update on new vaccine introduction in the Americas

Rotavirus Vaccines

Globally 86 countries (44%) of the 194 countries have introduced rotavirus vaccine (Monovalent- RV1 or Pentavalent-RV5) into their EPI schedules. 60 countries (70%) are using RV1 with the schedule of 2 doses, 17 countries (20%) are using RV5 with the schedule of 3 doses, and 8 countries (9%) are using both vaccines. In LAC, 19 countries have introduced these vaccines. Also more countries are using RV1 (17 countries) compared with 2 countries or territories using RV5.

Pneumococcal conjugate vaccines (PCVs)

Of the 135 countries of the world that have introduced PCV, 69% (93 countries) are using PCV13, 22% (30 countries) are using PCV10, and 8% (11 countries) are using both. Regarding the schedule of the vaccine, 108 (80%) of the 135 are using 3-dose schedules (either 2+1 or 3+0). Currently 34 countries and territories in the Americas have introduced the Pneumococcal conjugate vaccines (PCV-10 or PCV-13) representing approximately 95% of the region's birth cohort.

8.2. Systematic review of impact and effectiveness of PCVs

Several Latin American and Caribbean (LAC) countries have introduced pneumococcal conjugate vaccine (PCV-10 or PCV-13) in their routine national immunization programmes. We aimed to summarize the evidence of PCV impact and effectiveness on hospitalizations and mortality in children under 5 years old in the LAC Region.

A systematic review of the literature on impact or effectiveness of PCVs on deaths or hospitalizations due to invasive pneumococcal disease (IPD), pneumonia, meningitis and sepsis was conducted. Medline, WoS, Lilacs, Scopus, Central and gray literature published in any language from 2009 to January 2016 were searched. Included were studies addressing the outcomes of interest in children in the target age group, and with the following designs: randomized trials, cohort or case-control, interrupted time series with at least three data points before and after the intervention, and before-after studies. Screening of citations, data extraction, and risk of bias assessment were conducted in duplicate by independent reviewers, according to the study protocol registered on PROSPERO. Descriptive analysis of the effectiveness measurements and sensitivity analysis were conducted. Effectiveness is reported as 1-OR or 1-RR for case control or cohort/clinical trials, and as percent change of disease incidence rates for before-after studies.

1,085 citations were identified, 892 from databases and 193 from other sources. Of these, 22 were further analyzed. Studies were from Brazil, Chile, Uruguay, Argentina, Peru and Nicaragua. Effectiveness ranged from 8.8-37.8% for hospitalizations due to X-ray confirmed pneumonia, 7.4-20.6% for clinical pneumonia, and 13.3-87.7% for meningitis hospitalizations, and 56-83.3% for Invasive Pneumococcal Disease (IPD) hospitalization, varying by age, outcome definition, type of vaccine and study design.

Available evidence to date indicates significant impact of both PCV-10 and PCV-13 in the outcomes studied, with no evidence of the superiority of one vaccine over the other on pneumonia, IPD or meningitis hospitalization reduction in children under 5 years old.

A paper written by Lucia Helena de Oliveira, Luiz Antonio Bastos Camacho, Evandro Silva Freire Coutinho, Martha Silvia Martinez Silveira, Ana Flavia Carvalho, Cuauhtemoc Ruiz-Matus and Cristiana Maria Toscano has been accepted in November 2016 for publication by PlosOne

UPDATE ON NEW VACCINE INTRODUCTION IN THE AMERICAS: Conclusions and RECOMMENDATIONS

1. Many countries in Caribbean have introduced PCV and RV vaccines. Both vaccines show an important impact in reducing hospitalizations and deaths among children. Based on the accumulated regional experience and evidence, countries and territories in the Caribbean that have yet to introduce these vaccines should consider their introduction.

2. Where countries and territories have introduced PCV and RV vaccines, PAHO should support national immunization programmes to document the health impact associated with these vaccines.
3. Adequate coverage of children with PCV vaccines provides good herd protection for the elderly.
4. A systematic review of the evidence shows clear effectiveness of PCV10 and PCV13, with neither vaccine showing a superior effect.

8.3 Technical update on HPV vaccination

While most countries in the Caribbean do not have data for mortality related to HPV related cancers, it is certain that the number of cervical cancer cases and deaths due to HPV infection is projected to increase over time in the absence of vaccination. In 2014, the WHO position paper changed the HPV vaccination schedule recommendation from 3 doses to 2 doses given 6 months apart targeting girls aged 9 to 13 years. After more than 10 years of use and more than 200 million doses provided, there is strong evidence of the safety and efficacy of the vaccine. To date, there is no scientific evidence to show that any HPV vaccine is harmful or has issues in regards to safety, although there are various reports from anti-vaccine groups incorrectly linking mysterious illnesses and side effects to the HPV vaccine. Both the bivalent and quadrivalent vaccine have high efficacy against CIN2+ and CIN3+ lesions, with the quadrivalent also protecting against genital warts. It should be recognized that the Americas is the first region in the world to maintain around 80% of the target population (typical adolescent girl cohort) vaccinated with HPV vaccine.

8.4. Country Reports on HPV vaccination introduction

8.4.1. Antigua and Barbuda

Antigua and Barbuda has a population of approximately 86,000 people. Within this population, girls/women 13 years and older are at risk of developing cervical cancer. Health Information Digest 2015, ranks cervical cancer as the first most common cancer among women in Antigua and Barbuda, and the second most common cancer among women between 15 and 44 years of age. Antigua and Barbuda plans to introduce the HPV vaccine to both girls and boys, with the aim to prevent cervical cancer among women as well as make cervical cancer screening and prevention services available.

In 2013, community health workers were sensitized about HPV and the vaccine and a meeting was held with the Ministry of Health (MOH), nurses, and other stakeholders to discuss HPV vaccine introduction. In early 2014, the MOH partnered with the Ministry of Education to sensitize the entire education system, including parents, teachers, and other advocates. Following this, educational pamphlets were printed for distribution, one-on-one and group discussions were held in clinics, and other media promotion occurred through radio and events. The HPV quadrivalent vaccine is set to arrive in Antigua in early December, and upon vaccine arrival, the plan is for public health nurses and their teams to go to schools and administer the vaccine to both boys and girls.

8.4.2. Belize

The National Cervical Cancer Committee of Belize spearheaded the process of introduction of the HPV vaccine into the national vaccination schedule. From January 2015 to date the following has been completed: Petition signed by stakeholders supporting the introduction of the vaccine; Cabinet approval granted; financial support from the Belize Social Security Board for the procurement of the vaccine; face-to-face sensitization of more than 600 stakeholders within and outside of the Ministry of Health [religious leaders at all levels, teachers' organization,

Minister of Education and senior management team, doctors and nurses]; radio and TV talk shows. Of note was the acceptance of vaccine introduction by religious leaders, and even the request about sexuality education with the HPV vaccine.

There was a challenge in getting the vaccines to arrive on time, and a push was made to get the vaccine as soon as possible to minimize the delay between sensitization and preparation and actual administration of the vaccine. The vaccines arrived October 20th, 2016, after which training for immunization personnel on vaccine management and administration was done. In preparation for vaccine administration, parents were encouraged to provide breakfast for vaccinees, and some nurses took it upon themselves to provide breakfast at the clinics for vaccinees in order to reduce the likelihood of fainting post-vaccination. A breakfast meeting with media personnel was held on November 1; a press conference on November 3 [Director of Health Services, President Belize Cancer Society, Religious leader, OBGYN Oncologist from the private sector and the MCH Technical Advisor]. Despite Hurricane Earl making landfall in Belize and a 2 week teachers strike, the 'first dose coverage achieved countrywide is 71% with rates by district from 56% to 83%.

8.4.3. St. Vincent and the Grenadines (SVG)

In 2014 a study was conducted in SVG on Prevalence of High Risk types of Human Papilloma Virus (HPV) in women 30 years of age and older. The findings and recommendations from the study provided information to help St. Vincent and the Grenadines strengthen their programme for cervical cancer prevention and control. A committee was set up to discuss the strengthening of the programme, and, guided by the WHO recommendation for a comprehensive approach to cervical cancer prevention and control, the decision to introduce HPV vaccine in SVG was made. It is envisaged that the introduction of the HPV vaccine will offer protection against HPV related diseases and hence an eventual reduction in the incidence of genital and oral cancers.

During introduction of any new vaccine, communication and information management are critical to success; therefore a HPV fact sheet with brief information holders covering all aspects of HPV introduction was developed. Technical cooperation was also requested from PAHO to assist with stakeholder meetings as well as press conferences. Meetings will also be held with all categories of staff in primary health care and doctors from the private sector that receive vaccines from the National EPI programme. The goal of these meetings is to ensure that all stakeholders understand the importance of HPV introduction in the global, regional and local context as well as receive standardised information on all aspects of HPV, including documentation of coverage data and AEFI monitoring. Press conferences will be arranged with representatives from all media outlets, with the aim to provide clear and correct information to the press and public at large.

Vaccination will commence in 2017 using a school-based immunization strategy. HPV vaccination is most effective before the onset of sexual activity therefore three doses of HPV will be administered to boys and girls 10 years of age, with the final dose considered at the time of the 3rd Td booster. Persons absent from school during vaccination sessions will be identified and followed up for vaccination as needed by the FNPs/District Nurses. HPV vaccination coverage will be calculated and monitored for quality and level of coverage.

HPV VACCINE: Conclusions and RECOMMENDATIONS

1. Countries and territories that have introduced or plan to introduce HPV vaccine are commended for demonstrating a commitment to reducing the burden of cervical cancer in the Region.

2. Countries and PAHO should document lessons learned from introducing HPV vaccine in the Caribbean so countries that plan to introduce HPV in the future can learn from best practices around effective communication, social mobilization and delivery strategies.
3. Countries and territories should consider the global and regional TAG recommendations when defining target groups and delivery strategies for HPV vaccination. Two doses of HPV2 or HPV4 vaccine are recommended for girls age 9-13. Considering the regional priority to reduce cervical cancer, countries and territories should prioritize high coverage of HPV vaccination in girl cohorts before introducing gender neutral (boys + girls) strategies. With coverage at 80% or higher, herd immunity protects against HPV infection in non-vaccinated populations and therefore protection for all adolescents can be achieved with high coverage in girls only.
4. The evidence shows that the bivalent, quadrivalent, and nonavalent HPV vaccines all have similar effectiveness in preventing cancer of the cervix.

9. Surveillance and Immunization Awards

The annual **Caribbean Surveillance Shield** was established to recognize countries that have performed outstandingly on the surveillance component of their programme during the previous year. The award is based on the following criteria:

1. Timeliness of reporting
1. Percentage of sites reporting
2. Number of fever and rash cases reported compared to the expected
3. Rate of fever and rash cases
4. Adequacy of investigation of reported cases
 - a. Percentage with blood samples
 - b. Percentage with adequate investigation
 - c. Level of completeness of investigation forms
5. Quality of weekly surveillance reports, including reporting of other VPDs

The award consists of a certificate and the inscription of the name of the winning country on a plaque that is kept by the country during the following year until a new country is selected to receive the award. For 2016, the surveillance award was presented to the host country Grenada. Awards for the second and third places went to Belize and Barbados, respectively.

The **Henry C. Smith Cup** is in honor of Mr. Henry C. Smith, who was the first PAHO-EPI technical officer for the Caribbean Sub region and whose service in the Sub region spanned 18 years. This award is given to the country that has made the most improvement in EPI during the past year. This year the award was presented to the British Virgin Islands.

Participants at the 32nd Caribbean EPI Managers' Meeting sincerely congratulated these countries for being the recipients of awards and extend their compliments to all their health workers for their continued dedicated and outstanding performance during the past year.

10. WORKSHOPS ON EPI RELATED ACTIVITIES

Following the EPI Managers' meeting, the opportunity of having all the EPI managers together was used to conduct various workshops on other programmatic areas related to immunization. These included workshops as follows:

- Global Vaccine Market and Demand Planning

- Use of the Auto-disable syringes
- HPV introduction planning
- Regional Immunization Action Plan and monitoring through the JRF

10.1 Global Vaccine Market & Demand Planning

The objective of this workshop was to organize and conduct sensitization and training of EPI Managers on the Global Vaccine Market & Demand Planning as well as the use and management of Auto-Disable (AD) Syringes in collaboration with FGL/IM and PRO

Materials provided to participants may be found at the following link: [Caribbean EPI Managers Meeting Dec 2016](#)

An overview of the global vaccine market was provided highlighting trends in the vaccine market, the complexities of the vaccine manufacturing processes, and the imbalance that at times can exist for certain antigens between country demand and supply availability.

Collaborative efforts between Ministries of Health and PAHO to ensure timely supply of vaccines to meet country needs through the RF were discussed highlighting the multi-pronged approach involving the accuracy of National Demand Forecasting Plans (PAHO-173), secure national budgets for vaccines with timely payments and the RF procurement.

It was understood that through collective efforts across the region and in PAHO to strengthen forecasting and procurement processes, the RF is an important tool for ensuring the sustainable and timely supply of vaccines and in influencing their corresponding prices. No one country or Organizational entity can do it on its own.

Country participants appreciated the wider overview to the RF supply chain, the procurement cycles, roles of stakeholders, and performance indicators. Improvement opportunities were identified for the PAHO 173 forecasting tool through work group discussion and practice with the tool using a case study. Issues that emerged from participants included:

- Importance of alignment between the Annual EPI Plan of Action (Biologicals) with the PAHO 173
- Need for an overarching process flow chart on RF procurement cycles
- The widely varied lead times for processing proformas by countries which range from 1 day to 60 days. Clarifying and acknowledging this wide variation is important.
- Freight costs for vaccines/syringes are overwhelming national budgets especially those which order small quantities of vaccines. Caution was raised in considering options to minimize these costs such as consolidating quarterly requirements to twice a year. While some countries have adopted this practice they have done so following careful review of cold storage capacity and inventory controls.
- Large numbers of domestic refrigerators are in use in national cold chains. The extent of the use of these equipment vs WHO prequalified equipment should be documented.
- On the issue of monitoring the vaccine shelf life, countries were referred to the VSSM tool from WHO which is being used in Jamaica in all its Parishes and is proving quite effective in monitoring vaccine distribution and expiry dates.

Participants also offered anonymous recommendations for the improvement of the PAHO 173 tool. These are captured in the following word cloud:

**Suggested Improvements to PAHO 173 Workbook Tool by
Caribbean Managers at Workshop on Demand Forecasting
for Vaccine and Syringes, Grenada, 1 December 2016**



10.2 Use of the Auto-disable (AD) Syringes

The PAHO TAG in its meeting of July 2015, held in Cuba, has recommended that all countries in the America's should be using only auto-disable (AD) syringes for the administration of vaccines. Towards this end PAHO has established a plan for assisting countries to undertake the transition from the use of standard single use disposable syringes to the use of AD syringes. The PAHO plan has six elements to support the countries in making the transition. These six elements are also important for the execution of the plan on the part of the countries and include: training, planning, inventory control, distribution system, supervision and good practices for the final disposal of used injection equipment. However, three of the elements underpin the successful execution of a country's plan. They are: training and development of materials, supervision and documenting good practices. These three elements are critical for ensuring that all patients receive safe injections. Health care workers must be trained in the proper handling and use of AD syringes; supervisors must monitor and document problems related to the use of AD syringes and/or their quality; assure that no health care service experiences a stock out of these syringes; and that used injection equipment is safely collected and transported for final disposal. PAHO will continue to validate these syringes through its regional quality control testing program, as it has been doing for the past decade. However, as with any plan, countries must allocate the yearly required funding for all activities of the elements of the plan as well as the procurement of AD syringes. The bulk purchasing of these syringes by PAHOs' Revolving Fund will assure that countries in the region have access to these syringes at a low price.

To fully implement the aforementioned PAHO plan and meet recommendation set forth by TAG, as stated above, participants were provided with the opportunity to practice use of four different designs of AD syringes and to provide feedback on each one.

Conclusions and Recommendations:

It was recommended that the RF team:

- Review country suggestions for improvement to the PAHO 173 forecasting tool and incorporate changes wherever possible.
- Address the issues emerging from the participants.
- Review lessons learned from the workshop, follow up with countries and use lessons learned to refine development of a similar workshop for Latin American countries in 2017.
- For forecasting of syringes countries should take into account the following:
 - From 2018 onwards, only AD syringes will be available through PAHO for vaccine administration. For reconstitution of lyophilized vaccines, disposable syringes will continue to be available.
 - Countries should therefore ensure timely procurement of the AD syringes and training of the health care workers in their use.

10.3. Planning for the introduction of HPV vaccine into routine immunization programmes

In the Caribbean, cervical cancer is the second most common cancer in females for both incidence and mortality. In 2012, there were an estimated 5,018 new cases and 2,254 deaths attributed to cervical cancer in females. Both the quadrivalent and bivalent HPV vaccines have been proven to be safe and effective in preventing cervical pre-cancers in women. WHO recommends HPV vaccination in girls aged 9-14 years when the vaccine is first introduced, although the target age for introduction should be determined at country level, based on expected age of sexual debut and feasibility of reaching girls at the target age. In subsequent years following introduction, the target population should consist of only one age cohort.

HPV vaccination comes with both challenges and opportunities. Challenges include sensitivities around addressing a sexually transmitted infection and only vaccinating girls, no existing vaccine delivery platform, as well as the need for robust communication and social mobilization. In light of these challenges, there are also opportunities to integrate HPV vaccination with other adolescent health services, create new partnerships through various collaborators, and potentially reduce the incidence of cervical cancer by 70+%.

Potential delivery strategies include health facility-based, school-based, outreach, and campaigns, each with its own benefits and drawbacks depending on the target population and country. Vaccine strategies should not only be compatible with existing vaccine delivery infrastructure and cold chain capacity in a way that is affordable, cost-effective and sustainable, but simultaneously achieve the highest possible coverage among the target group. Strategies that should be prioritized during the introduction process are those that can reach girls that are least likely to have access to cervical cancer screening later in life as well as those that have the potential to integrate with other adolescent health services.

Success of vaccine introduction depends highly on social mobilization and vaccine communication, in order to heighten community awareness, involve various stakeholders, as well as identify barriers and sensitivities against vaccination. Vaccine communication planning should start early and aim to reach and engage each target group individually. After vaccine introduction, coverage monitoring will be important to not only evaluate vaccine programme performance but also vaccine impact in the population. Monitoring will require data collection at the time of vaccine administration, and at a minimum include, age of the child, date of vaccination, and the dose number.

10.4 Developing communication messages and crisis management plans for HPV vaccine

Communication strategies need to be developed to not only address people who are against the vaccine but also those who support the vaccine, and strategies will differ for each country. There are various types of communication, and in order to be successful we need to understand and ask how different target groups receive information and tailor our communication strategies accordingly. Furthermore, these strategies should aim to convey the message in a way in which everybody perceives the same message. Participants received a lesson in perception through an activity in which different images were shown on the screen, and for each image there were various interpretations from different participants. Following this activity, the concept of risk perception was addressed, notably that the public perceives risk based on their values and emotions while experts perceive risk based on the degree of risk and the evidence available.

In addition to promoting the behavioral intervention, such as receiving the HPV vaccine, it is important to also evoke emotion in the target audience to influence them to voluntarily change their behavior. This can be done in many ways, for example addressing the concerns and opinions of the group or portraying a world without the life-saving intervention. These messages should be kept simple and highlight what you would like your audience to know, what you think your audience would like to know, and what your audience is most likely to get wrong. Lastly, engage the media before you have a problem or outbreak, so a trusting relationship is built prior to a big event, such as HPV vaccine introduction

10.5 Regional Immunization Action Plan and monitoring through the JRF

The goal of the Regional Immunization Action Plan (RIAP) is to respond to all the challenges with the health services at a regional level in order to respond to global vaccination plans. RIAP takes into consideration the PAHO strategic plan and biennial work plan, but also is in complete alignment with the Global Vaccine Action Plan (GVAP). The responsibility of RIAP ultimately lies in the member states to achieve safe and affordable vaccination through the entire life cycle, and is achieved through both general and strategic objectives. General objectives are focused on disease eradication, elimination and control goals, and the objectives are applied to a specific strategic area. Strategic objectives, on the other hand, can be applied to whichever strategic area, as they are not as specific as the previous objectives. The RIAP is a way to increase the emphasis on immunization, and incorporates numerous partners with the overall goal of strengthening our regional commitment to be accountable in achieving the goals and objectives of the GVAP.

The formal source of reporting on the RIAP and consequently the GVAP is the Joint Reporting Form (JRF). The WHO/UNICEF JRF process is almost a year long process, beginning in November with collection of the results and ending with submission to WHO and UNICEF in July. Results need to be reviewed at all levels, starting with the country review of their individual report, followed by review at the regional level, and lastly review at the global level. During the

meeting, each country reviewed their respective JRFs with Dr. Velandia, to examine the values reported for their country, as listed in the JRF tables, and to which indicator and overall objective they belonged.

10.6 Review for 2016 JRF process and new indicators

The JRF is used to monitor regional and global objectives, and is the main source of data for the GVAP. The JRF process is complex and requires a lot of work and time; however, the JRF is not only useful for PAHO, but also immunization managers as this information, and the process of collecting it, can also be useful in guiding decisions regarding immunization programmes.

The process begins with the finalization of the PAHO JRF in January/February, after agreement on requirements with the WHO/UNICEF. In April, country reports are received, reviewed by PAHO, and returned to countries with feedback until August. Upon finalization of each country report, PAHO sends a copy of each JRF to the WHO, and coverage estimates are then calculated, disseminated and published by WHO/UNICEF.

Based on the TAG recommendations from 2015, there was a need for improved completion, quality and opportunity of data review in regards to JRF reporting. For 2016, there was improvement from countries in the timeliness of both initial responses as well as returned feedback. Furthermore, the teamwork in and between countries did not go unnoticed and is commended. There are still opportunities for improvement, as some countries did not answer all the questions in the JRF, and there remain issues in filling out the JRF due to high work load and need for coordination with other departments. The main issues in regards to filling out the tables were blank cells, type of currency, and differences between tables that should match. As a reminder, if there are doubts or confusion, countries were reminded to seek clarification and ask questions. There will be some changes in the JRF for the next year, but there are many opportunities to improve work in countries to consequently improve the quality of data collection and diffusion of the JRF.

10.7 Recommendations to complete the JRF and comparison of 2015/2016 JRF

After a discussion of each table in the JRF and demonstration on how to fill in the appropriate data for each table, the countries were divided into groups to go through their respective JRFs and present on their findings and offer some suggestions for the future.

When examining the JRF, countries found:

- Some cells were left blank that should have been filled
- The complexity of data is a deterrent for national level programme managers
- There was mismatch of data in tables that should correspond
- Often the number was spelled out instead of using the digits

Other factors affecting the data collection and input in the JRF

- Denominator problems, especially in regards to influenza
- The data required isn't dependent on one unit alone; there is a need for collaboration and data from many other departments

Suggestions

- Creation of HPV and influenza specific questionnaires, or simplification of the influenza form
- Implementation of an Electronic Immunization Registry (EIR) for all countries would help with data collection, accuracy, and timeliness
- Create 2 reporting cycles during the year

- In some tables, if you respond “NO” the other cells in the table should auto populate accordingly

In addition to giving suggestions on how to modify the JRF, some countries suggested actions they could take in order to improve data collection and reporting in the JRF. Some countries made a commitment to filling out all fields for the upcoming year in order to help avoid the problem of blank cells, while some countries made a commitment to sensitizing national and sub-national stakeholders about the JRF so data collection is easier and completed in a timelier manner. Each presentation ended with a picture that reflected the JRF- from modern art to mazes; the day ended with an image of a disorganized closet becoming organized.



Participants at the 32nd Caribbean EPI Managers' Meeting, St. George's, Grenada

ⁱ <http://content.healthaffairs.org/content/35/2/199.abstract>