



Comprehensive Family Immunization Unit
Department of Family, Health Promotion and Life Course



THIRTY-THIRD MEETING OF THE CARIBBEAN IMMUNIZATION MANAGERS

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FINAL REPORT

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EXECUTIVE SUMMARY

The 33rd Caribbean EPI Managers' Meeting, held at the Hilton Trinidad and Conference Centre in Port-of-Spain, Trinidad and Tobago from 26-28 February 2018, convened 70 participants from 26 countries and territories of the English and Dutch-speaking Caribbean, as well as Haiti. Technical experts on immunization and other areas from the Pan American Health Organization/World Health Organization (PAHO/WHO), Caribbean Public Health Agency (CARPHA) and the Caribbean Community (CARICOM) were also in attendance.

Due to the impact of two category five hurricanes on many the islands in September 2017, the meeting had been postponed from November 2017. In his opening remarks for the meeting, Chairman Dr. Peter Figueroa highlighted the solidarity and support demonstrated by the Caribbean EPI family during the post-hurricane period and commended the response of EPI staff in the affected countries. The seven new EPI managers attending the meeting for the first time were welcomed into the EPI family.

A Caribbean immunization TAG (CiTAG), an independent body of experts that will advise the Ministries of Health of the Caribbean on immunization matters through CARICOM, was established during the meeting, thus formalizing the adaptation of regional recommendations to Caribbean priorities and context that has historically been done through the annual meetings of the Caribbean EPI managers. CiTAG commended and recognized the unstinting efforts of EPI managers and their teams in the Caribbean.

The meeting used a series of didactic presentations, plenary discussions and group work to provide technical updates on various vaccine-preventable diseases (VPDs), surveillance, programmatic issues such as data quality, outbreak responses and sharing of country experiences during 2017. As is customary, the group work facilitated the finalization of 2018 country plans of action for immunization, as well as plans for Vaccination Week in the Americas.

Key issues from the meeting included the need for improved vaccination coverage in every district as coverage in the Caribbean sub-region has declined slightly from an average of 94% in 2015 to 92% in 2016. Of concern is the MMR2 coverage, which has consistently been below 90%. Countries that have not yet done so were urged to reduce the age of administration of the MMR2 to within the second year of life to optimize protection among children against measles. The need for countries to ensure collaboration among the EPI and areas of epidemiology and laboratory to strengthen surveillance for VPDs in the public and private sectors was also highlighted. This is especially important considering the increase in measles cases occurring in several countries of Europe and the recent outbreaks in the Americas. The risk for re-importation is high and without sustained high coverage >95% and high-quality surveillance systems for timely detection and response to importations, the Region of the Americas could risk losing its measles, rubella and CRS-free status. Countries were also urged to strengthen their laboratory capacity where appropriate for diagnoses of measles and rubella.

Global polio eradication is now closer than ever and the Caribbean has done very well with implementing the global Polio Eradication and Endgame Strategic Plan, including reaching high

polio coverage levels and compliance with poliovirus containment requirements. However, to prepare for any possible importations, countries must update their national polio outbreak response plans and conduct simulation exercises.

Challenges with vaccination data quality remain for many countries and the implementation of a nominal electronic immunization registry with universal access by all providers is encouraged.

Despite relatively high DTP vaccination coverage, the recent report of sporadic cases of pertussis in some countries indicates the risk for re-emergence of this disease and the fact that cases may have an atypical clinical presentation. Countries using the whole cell pertussis vaccine were therefore cautioned not to switch to the acellular pertussis vaccine, as whole cell vaccines have shown greater immune protection and impact on carriage.

Introduction of the newer vaccines has been slow and to date 17 of the 25 countries and territories have introduced the HPV vaccine, with three of them doing so in 2017. Political will for newer vaccine introduction must be in place and countries must prepare thoroughly and systematically for HPV vaccine introduction to ensure that healthcare workers are prepared to face any issues that might arise. Frequent face-to-face communication, training on risk communication for healthcare professionals, as well as working with key influential groups are crucial to sensitize the public to the benefits of vaccination and provide healthcare workers with the skills to effectively recommend the vaccine to target populations. Promotion of the HPV vaccine should focus on cancer prevention and vaccine safety.

The Region has set an elimination goal of mother-to-child transmission of hepatitis B by 2020. To achieve this goal, all countries in the Americas should reach 95% coverage levels for the hepatitis B birth dose given within 24 hours of birth. Six countries/territories in the Caribbean have made progress with birth dose introduction and some are planning introduction soon. Countries that have not yet done so should consider working towards this goal so that the Caribbean region can continue to lead in elimination of VPDs.

The recent WHO position paper on tetanus vaccines (Feb. 2017) recommends a total of six doses of vaccines (three-dose primary series and three booster doses) to provide immunity that lasts through much of adulthood, thus protecting women throughout their childbearing years. The third booster dose given during adolescence (9-15 years) could be given along with the HPV vaccine to improve acceptance.

Planning is essential to immunization programs and may benefit from greater focus on human resources and program management, both at program and service delivery levels. Countries/territories should promote greater integration with national health plans in order to place immunization in the context with national health priorities, and broaden the scope of integration with other programs (ex. cancer prevention for HPV). JRF data collected annually represent a valuable resource for planning and they may be useful for situation analysis along with program reviews. Advocacy and communication should be further elaborated during planning and monitoring and evaluation need to be institutionalized and strengthened.

As the Caribbean is historically known to be at risk for natural disasters especially hurricanes, countries were reminded to ensure that adequate planning and preparedness policies are in place for the risk management and mitigation. During times like disasters, it is important to minimize the risk of reintroducing VPDs already eliminated in the Region. Thus, maintaining high population immunity, vaccinating humanitarian assistance teams and restoring routine vaccination in a timely manner are crucial.

The meeting reiterated the importance of PAHO's Revolving Fund for Vaccine Procurement and recognized the commitment of Caribbean governments to immunization as reflected by their funding of almost all vaccine costs. Nevertheless, countries were reminded to ensure timely payments to the Revolving Fund to avoid stock-outs. Countries were also reminded of the importance of having a legal basis for vaccination that protects the budget for vaccines and other critical immunization supplies. TAG, SAGE and CiTAG all recommend that countries enact laws to institutionalize vaccination.

PAHO commended the Caribbean sub-region for their strong commitment in carrying out activities for Vaccination Week in the Americas (VWA), and urged all countries and territories to use VWA as an opportunity to garner political involvement and maintain immunization as a political priority. VWA is also an opportunity to promote positive messages on the safety and effectiveness of vaccines, counteracting the negative effects of anti-vaccination groups.

Group work for the elaboration of action plans for 2018 was productive and EPI managers were asked to review and finalize them, cost the components and advocate for funding to support implementation. A need for in-depth EPI manager training in the immunization programmatic areas was recognized and this is to be considered for 2018.

The Henry C. Smith Cup is in honor of Mr. Henry C. Smith, the first Caribbean Immunization Officer, was given to St. Kitts and Nevis, the country that had made the most improvement in their EPI during 2016. The surveillance award was presented to Anguilla with St. Kitts and Nevis and St. Vincent and the Grenadines being awarded second and third places, respectively.

Special thanks to the government of Trinidad and Tobago for hosting the meeting in Port-of-Spain and to the Ministry of Health and PAHO's country office for their invaluable support.

INTRODUCTION

The 33rd Caribbean EPI Managers' Meeting was held at the Hilton, Port-of-Spain from 26-28 February 2018. The meeting convened 56 participants from 26 countries and territories, as well as immunization experts from PAHO/WHO, CARPHA and CARICOM. Health staff from the host country of Trinidad also attended the meeting.

Following brief remarks by Dr. Theodore-Gandhi, PAHO/WHO Representative of Trinidad and Tobago, Dr. Rudolph Cummings from CARICOM and Dr. Cuauhtemoc Ruiz-Matus, Chief of PAHO's Comprehensive Family Immunization unit (FPL-IM), who all reiterated the benefits of vaccination and the importance of ensuring that children are adequately vaccinated, the Minister of Health, Honorable Terrence Deyalsingh, opened the meeting and gave the main address.

In his address he quoted Dr. Ezekiel Emanuel, who said that vaccines are the most cost-effective healthcare interventions. He highlighted the importance of vaccines and in particular, the influenza vaccine which also serves to prevent maternal deaths when given to women during pregnancy. He charged the participants to be mindful of fake news and misinformation in the media about vaccination that can undo the good work of the immunization program in preventing 2-3 million child deaths each year. This was underscored by the impact the Andrew Wakefield study and report has had on measles epidemiology globally, but especially in the UK and Europe.

He reminded the group that there are organizations and people who don't share our common interest in immunization and we must be aware and prepared to manage that. His decisions on the ground communication and promotion of the influenza vaccine led to a significant uptake of the vaccine during the 2016/2017 influenza season and the current season as well.

Leading by example and receiving the vaccine himself was a powerful message of confidence in the EPI program. He reiterated that the EPI is a priority for the Ministry of Health of Trinidad and Tobago and that he pledged to continue his own public health promotion and education to enhance the program. He closed by congratulating and recognizing the work of PAHO/WHO and other UN organizations, NGOs and the health care workers for their collaborative work and ongoing efforts to deliver the EPI program.

MEETING OBJECTIVES

The overall objective of the meeting was to analyze achievements from 2017 and plan activities for 2018, while sharing country experiences on the immunization program.

The specific objectives were:

1. Review the status of the EPI program in the Region of the Americas and the Caribbean and to identify areas that require strengthening;
2. Provide an update on immunization in emergency situations and review the current status and needs of country EPI programs following hurricane Irma and Maria;
3. Update countries with information on selective topics of common interest in relation to immunization, service delivery and surveillance of VPDs;
4. Develop country action plans with specific budgets for each activity to achieve the targets and objectives set for 2018;
5. To discuss the plans to sustain Measles, Rubella and Congenital Rubella Syndrome (CRS) elimination in the Americas and the Caribbean;
6. Discuss the final requirements of the Polio Eradication and Endgame Strategic Plan 2013-2018 with a special emphasis on surveillance for acute flaccid paralysis (AFP);
7. Discuss the status and advances made by countries in the surveillance and management of VPDs;
8. Assess the status of and strategies for the introduction of newer and underutilized vaccines in national immunization schedules;
9. Share updates on EPI-related activities or initiatives implemented in countries.

Summary of Recommendations from 2017 TAG Meeting

Dr. Figueroa summarized the recommendations from the July 2017 TAG meeting held in Panama and highlighted the current successes and challenges for immunization programs in the Region. Dr. Figueroa reminded participants of the Regional Immunization Action Plan's (RIAP) four strategic lines of action: sustaining the achievements, completing the unfinished agenda to prevent and control VPDs, tackling new challenges in the introduction of vaccines and assessment of their impact, and strengthening health services for the effective administration of vaccines.

The midterm review of the implementation of the RIAP reported that 16 of 29 immunization indicators were on track:

- No cases of AFP due to poliovirus
- No reestablishment of endemic measles or rubella transmission
- Quality surveillance for measles, rubella, and CRS
- Hepatitis B vaccine birth dose
- National plans of action for immunization
- Beneficiary satisfaction surveys during VWA
- Cost-effectiveness studies before introducing new vaccines
- Studies assessing introduction of new vaccines
- Vaccination of pregnant women against influenza and tetanus
- Financing for immunization $\geq 90\%$ with national resources
- Adequate supply of quality vaccines
- Dropout rate $< 5\%$ between the first and third doses of DTP

- Improvement in quality of coverage data
- Introduction of electronic immunization registries
- Post-marketing surveillance of vaccines
- Vaccination of health workers

Indicators considered to be in progress were neonatal tetanus incidence < 1/1,000 registered live births, introduction of one or more new vaccines in the national schedule and integration of other preventive interventions with vaccination.

The off-track indicators were:

- Quality of AFP surveillance
- Existence of a legal basis for immunization programs
- National Immunization Technical Advisory Groups (NITAGs)
- National DPT3 coverage ≥95% in children aged <1 year
- Sub-national DPT3 coverage ≥80% in each district in the <1 year
- Monitoring vaccination equity –coverage by income quintile
- Accuracy of supply and demand for vaccines procured through the Revolving Fund
- National DPT3 coverage ≥95% in children <1 year for those aged 3+ years
- Removal of barriers to reach the unvaccinated or under-vaccinated
- Reporting of stock-outs of vaccines or related supplies for one month or more at any level.

Recommendations for measles were to achieve coverage ≥95% coverage in all cities, and reduce the age of MMR2 administration to the second year of life – at 18 months. During outbreaks, countries must lower the age for vaccination to 6 months. In Venezuela, an ongoing measles outbreak threatens the elimination status of the Americas.

Regarding polio, three countries remain polio endemic – Afghanistan, Pakistan and Nigeria. To maintain polio eradication in the Region, it is crucial to sustain coverage levels over 95% in every district and maintain adequate AFP surveillance. There continues to be a global shortage of IPV and thus, countries should reduce wastage of IPV vaccine. Evidence strongly suggests that two doses of fIPV given intradermally offer more protection than one dose of IPV given intramuscularly. Polio containment measures are also fundamental to the polio eradication plan.

Brazil has had extensive outbreaks of yellow fever during 2017. Yellow fever endemic countries in the Caribbean have high vaccination coverage among children one year of age, and Trinidad and Tobago, Guyana and Panama have not seen cases of yellow fever for some time, while Suriname reported one confirmed case in 2017.

Caribbean EPI priorities were highlighted as follows:

- Sustaining the gains – ensuring a legal basis for EPI

- Immunization coverage >95% for all antigens in all districts
- High quality surveillance
- Polio endgame – 2 doses fIPV > 1 dose of IPV recommended for countries with birth cohort >100,000
- Hepatitis B birth dose
- HPV vaccine introduction and coverage
- Pneumococcal introduction and coverage
- Building capacity of EPI managers through training
- Promoting understanding of the value of vaccines

Caribbean Immunization Technical Advisory Group

In July 2017, PAHO’s TAG reiterated the independent advisory role of NITAGs and encouraged all countries in the Americas to formally establish these committees, considering the guidance developed by PAHO. It also urged PAHO to support English-speaking countries in the Caribbean to formalize their technical advisory structure.

The Caribbean immunization TAG (CiTAG), an independent body of experts that will advise the Ministries of Health of the Caribbean region on immunization matters through CARICOM, held its inaugural meeting during the EPI Managers’ meeting. The goal of the CiTAG is to strengthen the policy and evidence-based decision making process for immunization in CARICOM member and associated states. Specific objectives of the CiTAG include promoting strategies to strengthen and ensure equity in immunization services, review progress and make recommendations to improve EPI programs, identify research needs and oversee progress, provide evidence-based recommendations for EPI policies and strategies and promote policy dialogue among key stakeholders.

The CiTAG will provide technical guidance on selection and introduction of vaccines, vaccine administration, vaccine safety– Events Supposedly Attributable to Vaccination or Immunization (ESAVIs), program quality – data quality, vaccine hesitancy, surveillance for VPDs and vaccine development.

The CiTAG will be a multi-disciplinary group of no more than seven independent expert members from the fields of Vaccinology, Paediatrics, Epidemiology, Public Health, Internal Medicine, Infectious diseases, Microbiology and Virology, Health Systems, Health Economics, Social Sciences and Communication. The following members were selected: Dr. Peter Figueroa as CiTAG Chair, Dr. Philippe Duclos, Dr. Gabriel Gonzales Escobar, Dr. Tracy Evans Gilbert and Dr. Elizabeth Ferdinand. Ex-Officio members and joint secretariat will be Dr. Rudolph Cummings (CARICOM) and Dr. Karen Lewis-Bell (PAHO/WHO advisor on immunization).

Creation of the CiTAG formalized the adaptation of regional recommendations to Caribbean priorities and context, which has historically been done through the annual meetings of the Caribbean EPI managers. It may further contribute to keeping the priority of immunization in the regional public health agenda and advocate for immunization programs.

UNIVERSAL VACCINATION COVERAGE

Update on EPI in the Americas

The goals and objectives of the Global Vaccine Action Plan (GVAP) (2011-2020) and the RIAP (2016-2020) are the frameworks used to guide the strengthening of the immunization program. The Region of the Americas has been successful in eliminating measles, rubella and CRS, eradicating polio and controlling diphtheria and pertussis. Although DTP3 coverage in the Americas has remained stagnant at 90-91% for the past three years, the regional average remains higher than the global average which was 86% in 2016. Some 23% of countries in the Region of the Americas reported DTP3 coverage less than 90% in 2016. Coverages for the birth dose of Hep B, HepB3, PCV3 and rotavirus have remained at less than 90% and coverage for MMR2 in the Region has remained at less than 70% in 2016. There continues to be concern regarding inequity in the provision of vaccination services in countries, as most countries continue to have municipalities with varying coverage rates and 25% of the municipalities have less than 80% coverage. With 40% of municipalities reporting coverage greater than 100% and countries reporting negative drop-out rates for DTP, this continues to raise concerns regarding the quality of the coverage data.

The Region of the Americas is performing relatively well with respect to coverage for PCV3, rotavirus and the introduction of the HPV vaccine and Hep B birth dose compared to the global trends. With the recent outbreaks of measles and diphtheria in Venezuela and yellow fever in Brazil, this poses a challenge for the Region and the countries of the Caribbean, as the risk of importation of these diseases is high. Countries are therefore urged to ensure high homogenous coverage for vaccines and high-quality surveillance for the timely detection and control of imported cases and outbreaks.

Overview of the EPI in the Caribbean

2017 marked forty years of the EPI program in the Caribbean and the commitment to the program continues to be demonstrated by 98% funding for the cost of the immunization program and 99% funding for the cost of the vaccines as covered by governments. All twenty-two countries expected to submit the WHO/UNICEF Joint Reporting Form on Immunization for 2016 submitted them. Analyses of the reports indicated that many the RIAP objectives and indicators have been met, but areas for improvement remain.

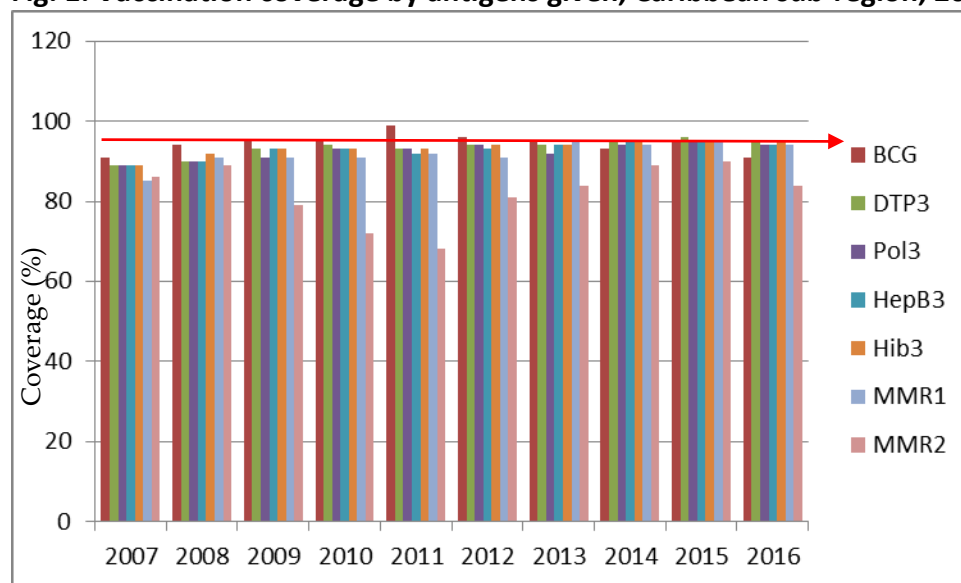
The objectives of the EPI program remain as follows:

1. Achieve equity in the provision of vaccine services by achieving and maintaining $\geq 95\%$ coverage for all antigens at national and district levels
2. Maintain status of polio eradication
3. Maintain status measles, rubella and CRS elimination
4. Maintain status of NNT and diphtheria elimination

5. Maintain and strengthen surveillance for VPDs with emphasis on measles, rubella, CRS and polio
6. Advocate for the introduction of newer and underutilized vaccines using an evidence-based approach

The objective of at least 95% coverage for all antigens was achieved by many countries. However, for the Caribbean sub-region, 2016 saw a slight decrease in coverage for all antigens except for Hib which remained at 95% coverage as in 2015. The greatest decline in coverage was in BCG, moving from 95% in 2015 to 91% in 2016 and MMR2, which decreased from 90% in 2015 to 84% in 2016.

Fig. 1: Vaccination coverage by antigens given, Caribbean sub-region, 2007-2016



Despite relatively high national vaccination coverage for all antigens in most countries sustained for over three years, this was not equitably distributed as several municipalities with low vaccination coverage remain in all but three countries/territories in 2016.

Table 1: Percentage of municipalities by coverage levels reported, 2016

Vaccine	Coverage Levels				
	<80%	80-89%	90-94%	95-100%	>100%
DTP3	8	16	16	43	19
Polio 3	9	18	11	41	21
MMR 1	12	16	15	39	18
MMR 2	20	22	18	29	11

In 2016, some 38-43% of municipalities had coverage less than 95% for DTP3, Polio 3 and MMR1. For MMR2, this was even higher at 60%. The continued reporting of coverage >100% from countries indicates the need for improved data quality, as this indicates possible ongoing challenges with the accuracy of the target population for the under-1-year-olds or duplication

of coverage data. Of note, 85% of the districts reported >100% coverage for DTP3 and Polio3 in one country. The smaller islands, which have as much as 6-8% of their under-one-year-olds born out of the country, must ensure that these infants are included in the denominator/target populations for vaccination coverage. Similarly, smaller countries/territories that have a high rate of external migration must remove those infants who they are absolutely sure have left the country before the age of 6-11 months from their denominator/target population.

Introducing newer and underutilized vaccines in the routine immunization schedule in the public sector continues at a slow pace. The HPV vaccine was introduced in Jamaica and St. Vincent and the Grenadines; Guyana expanded the introduction of the HPV vaccine to the whole country in 2017. Almost all countries use the influenza vaccine for various risk groups, but acceptance of the vaccine is voluntary even for pregnant women and healthcare workers.

All countries continued surveillance for VPDs and there were 719 surveillance sites for measles, rubella, CRS and other VPDs; there were 498 surveillance sites for polio.

In 2017, 97% of the sites reported fever and rash and 84% of sites reported for AFP. There were 175 fever and rash cases reported with a case detection rate of 2.2/100,000 population. Twenty-six AFP cases were reported for 2017 but only six of these cases were under the age of 15 years yielding a detection rate of 0.34/100,000 population < 15 years.

All countries in the Caribbean observed the 14th annual Vaccination Week in the Americas with a special emphasis on the 40th anniversary of the EPI. Training in various aspects of EPI including surveillance, HPV and Hep B birth dose introduction, cold chain management and Vaccine Supply Stock Management (VSSM) occurred in Suriname, Bermuda, Antigua and Barbuda, Cayman, St. Vincent and the Grenadines and Jamaica. Training in the use of the Electronic Immunization Registry (EIR) occurred for St. Kitts and Nevis, Montserrat and Turks and Caicos Islands and the EIR was fully implemented in St. Kitts and Nevis.

Countries continued procuring vaccines and supplies through the Revolving Fund for the EPI, concerns remain regarding the cold chain excursions upon vaccine arrival in countries due to packaging issues by suppliers and the timeliness of payment on invoices by some countries.

Despite achievements, there continue to be challenges. The transitioning of country immunization managers through re-assignments, resignation or retirement resulted in seven new country EPI Managers in 2017. In addition, responses to two of the most severe hurricanes in history severely impacted services and stretched the human resource capacity of the countries including the EPI managers.

The governments continue to remain committed to the goals and objectives of universal immunization and elimination of VPDs. Much has been achieved in the EPI program for 2016 and 2017. Coverage has declined for 2016 and the greatest concern is in regard to MMR2 coverage. Despite relatively high national coverage in many countries, equity in coverage requires improvement in most countries. VPD surveillance needs continued strengthening and

improved coordination between EPI and epidemiology at the country level. After 40 years of EPIs in the Caribbean, much has been achieved of which the sub-region can be proud, but areas for improvement remain, especially in the introduction of the HPV and PCV vaccines.

Recommendations

- To maintain the gains in elimination of VPDs, countries must increase efforts to ensure achievement of 95% or greater coverage for all antigens in use in all districts.
- Countries should institutionalize regular meetings with EPIs, surveillance and laboratories to improve coordination and strengthen VPD surveillance.

SUSTAINING ELIMINATION OF MEASLES, RUBELLA AND CRS

Plan for the Sustainability of Measles, Rubella and CRS Elimination in the Americas

Measles Outbreaks at the Global Level

Despite global efforts to push measles elimination in the six WHO regions of the world, the global number of measles cases has not decreased sufficiently and in some regions the number of cases in 2017 has increased compared to 2016.

At the global level, WHO is monitoring the measles incidence rate per million population and, except for the Americas, which remains as the only region that has eliminated measles, all the other regions have more than five cases per million population, although 81 countries of the world (41%) have fewer than one case per million population.

Measles has rebounded in the WHO European Region with 21,315 cases and 35 deaths in 2017, compared to a record low of 5,273 cases in 2016. Large measles outbreaks are affecting one in four European countries with the highest numbers of cases reported in Romania (5,562), Italy (5,006) and Ukraine (4,767). These three countries had 72% of the total cases in 2017.

India is the country with the highest number of cases in the world, but with a follow-up campaign targeting 450 million children between 9 months and 15 years conducted since August 2017, it is hoped that this will change the epidemiology of measles transmission in the SE Asia region and around the world. The Western Pacific region has done much work towards successfully eliminating measles as reflected in the decrease in the number of cases in China and Malaysia in 2017.

Rubella is still circulating in all regions in the world, except in the Americas. However, tremendous progress has been made in the European Region where there is a goal for rubella elimination as well. The most common rubella genotype reported as circulating in the world is 2B.

Measles Outbreaks in the Americas in the Post Elimination Era

The Region of the Americas met the target to eliminate endemic measles transmission in 2002 and has maintained this status for over a decade despite continuous importations of the virus in

countries of the Region. In the post-elimination period, from 2011-2017, the annual average number of cases was five times greater than the period 2003-2010, with more than 5,600 reported cases.

In 2011-2017, there were 58 measles outbreaks in total, 30 of them consisting of a single case and six involved 20 or more cases. Genotype D4 was identified in 49% of the outbreaks (28 out of 58). However, the outbreaks that involved the most secondary cases, in different years and different countries, were traced to genotypes D8 (n=927 cases) and B3 (n= 414 cases).

For these outbreaks, adolescents and young adults aged 15 to 39 years were the group most affected (37%), followed by children aged 5 to 14 (25%) years. Of the confirmed cases, 49% had never been vaccinated; in 9% of cases the vaccination status was unknown.

In 2017, there were 983 confirmed measles cases in all the Americas, less than one case per million at the regional level. These cases were reported in four countries: 120 cases in the United States of America, 45 cases in Canada, 3 cases in Argentina and 815 cases in Venezuela.

Measles Cases in Venezuela 2017-2018

In Venezuela, an ongoing measles outbreak that started in epidemiology week 26 of 2017 in the municipality of Caroni has resulted in 952 confirmed cases for the period (815 cases in 2017 and 137 cases for the first four epidemiological weeks of 2018). The highest incidence rate was in children under one year old followed by the children aged one year and 2-5 years. There have been two reported deaths in children and genotype D8 was isolated, but with a different lineage from the D8 that circulated before in Brazil. The source of the infection has not been identified.

Of note, the country had not had endemic measles transmission for 15 years, since 2002. The index case was an unvaccinated infant less than one year old with onset of rash on 1 July 2017. It has now been eight months of measles virus circulation in Venezuela and this poses a threat to the Region of losing the certification for measles elimination.

Plan of Action for the Sustainability of Measles, Rubella and CRS Elimination in the Americas

To protect the achievements in the Americas, PAHO has developed a Plan of Action for the Sustainability of Measles and Rubella Elimination in the Americas, which was unanimously approved by the Ministers of Health during the last Pan American Sanitary Conference in September 2017. This Plan has four Strategic Lines of Action, objectives, indicators and goals for the period 2018-2023.

The plan was widely discussed among 120 participants of 31 countries during the measles-rubella regional meeting in Panama City, April 2017 and was approved by the TAG in July in Panama, as well.

Strategic Lines of Action

- 1. Guarantee universal access to measles and rubella vaccination services** for the population targeted in the routine immunization program and other at-risk age groups. The objective of

achieving $\geq 95\%$ coverage for both doses of the MMR vaccine among children < 5 years and for follow-up campaigns has not been achieved. Although most countries in the Region have achieved more than 95% at the national level with MMR1, twelve countries including some in the Caribbean have not achieved this. The Region of the Americas has not achieved at least 95% of coverage with the MMR2 and for this reason many countries still need to conduct follow-up campaigns every four or five years. Some countries have still not reduced the age of MMR2 to 18 months as recommended by TAG in 2013.

- 2. Strengthen the capacity of epidemiological surveillance systems** for measles, rubella, and CRS. The objective is to monitor the quality and sensitivity of epidemiological surveillance of MR/CRS and ensure achievement of the classic MR surveillance indicators. The rate of reported suspected cases has dropped to 1.63 cases per 100,000. The expected rate is 2 per 100,000 population. This decline reflects the challenges countries face with maintaining sensitive, high-quality surveillance systems with emerging febrile diseases (Zika, in particular), which could mask suspected cases of measles and rubella. Another reason is the lack of health workers' knowledge about clinical and epidemiological aspects of measles and rubella. During the past five years (2013-2017), the percentage of cases with adequate investigation and the percentage of cases with adequate serum samples exceeded 80%. However, the percentage of sites reporting weekly, the percentage of samples submitted within five days, and the percentage of laboratory results reported within four days have been less than 80%. We now need to get three samples of serum, urine and nasopharyngeal swab in order to confirm cases with viral isolation and genotype identification.
- 3. Develop national operational capacity** to maintain measles and rubella elimination with the objective to implement and monitor sustainability plans by strengthening the national response capacity to imported cases. All countries are required to have a national committee or a sub-regional commission in the case of the English and Dutch-speaking Caribbean, to monitor sustainability plans for measles and rubella elimination and annually report on the implementation.
- 4. Establish standard mechanisms for rapid responses to imported cases** of measles, rubella, and congenital rubella syndrome to prevent the reestablishment of endemic transmission in the countries. This is one of the most important strategies to sustain elimination. If all countries do not have a rapid response team trained to prevent the spread of virus transmission, it will be almost impossible to sustain elimination.

Rubella Cases in the Americas, 2010-2017

Between 2010 and 2017, 72 imported rubella cases have been reported in eight countries: Argentina (4), Brazil (1), Canada (17), Chile (1), Colombia (2), French Guyana (1), Mexico (2) and United States (37). With respect to CRS, eight imported cases were reported in two countries: Canada (1 in 2011 and 1 in 2015) and the United States (3 in 2012 and 1 in 2013, 2014 and 2015, respectively).

Review of Fever/Rash and CRS Surveillance in the Caribbean

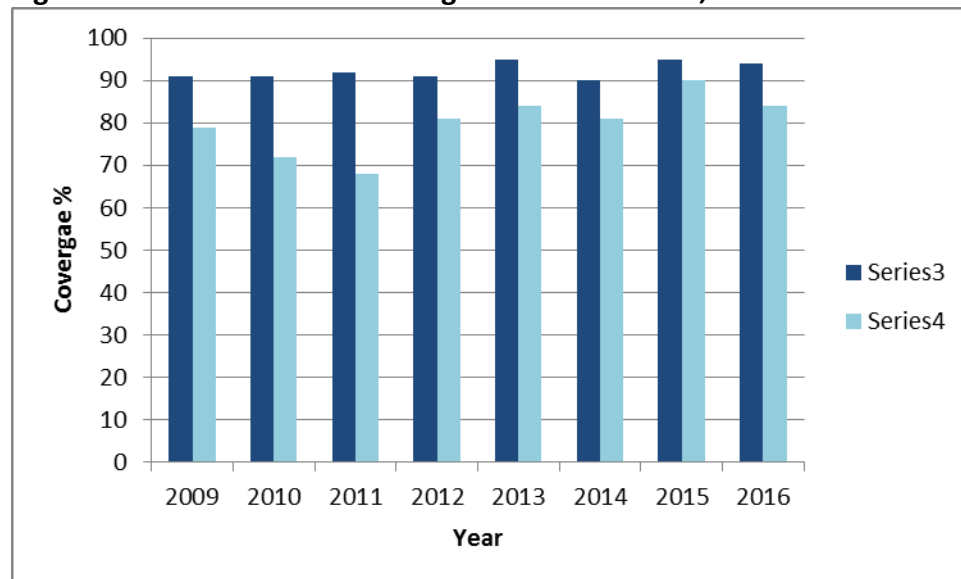
The high dependency on tourism and other international travel for business continues to put the Caribbean at high risk for the re-importation of measles and rubella although the sub-region has been free of measles for 26 years and rubella for 16 years. This underscores the importance of maintaining high-quality surveillance for suspected cases in order to ensure a timely response to an imported case.

The objectives of rash and fever surveillance are:

- Maintain measles, rubella and CRS elimination
- Achieve timely, complete, regular and accurate surveillance for measles and rubella with active case finding
- Maintain >95% coverage for two doses of the measles and rubella vaccine for each birth cohort
- Ensure all measles, rubella and CRS indicators are met in each country – at least 80% achievement
- Ensure no established local transmission of measles and rubella following importations

From 2010-2016, MMR1 coverage in the individual Caribbean countries and territories ranged from a low of 81% to a high of 100%, whereas coverage for MMR2 was lower, ranging from 43% to 100%.

Fig. 2: MMR1 and MMR2 Coverage in the Caribbean, 2009-2016



For 2017, there were 719 surveillance sites for measles and rubella from 20 countries. In 2017, there were 175 suspected measles, rubella and CRS cases reported, but no cases were confirmed as measles, rubella or CRS. The rate of case reporting was 2.2 per 100,000

population. Out of all cases, 94% were adequately investigated, 97% had adequate sample collection, 11% of the samples were received by the lab within 5 days and 78% of the lab results were returned within 4 days. 97% of cases were discarded by the laboratory.

Although twenty-two countries were expected to report fever and rash cases for 2017, cases were reported from eleven countries; primarily Jamaica (62%), Belize (19%) and Guyana (9%). 55% of the cases were female and 85% were under the age of ten years.

Table 2: Surveillance Indicators, 2011-2017

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
2017	98	94	97	11	78	97

Surveillance for measles, rubella and CRS continued in 2016 but challenges remain 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 both MMR1 and MMR2 at the national and district levels. Given the increase in measles cases occurring in several countries of Europe and the recent outbreaks in the Region of the Americas, it is essential that countries remain vigilant for importations of measles and strengthen their surveillance systems.

Review of Measles and Rubella Laboratory Test Results in the Caribbean

A summary of the measles and rubella situation in the Caribbean sub-region was presented. Of note was a reduction in the number of samples submitted by the countries to CARPHA, a drop of 33% in comparison to 2015. CARPHA encouraged countries to improve and maintain the surveillance system, especially now, with the new situation of the imported cases of measles in the sub-region.

Country Reports on Fever and Rash Surveillance and Status of Indicators

Suriname and Trinidad and Tobago

Suriname and Trinidad and Tobago presented their situations and challenges with fever and rash surveillance. For Suriname, the majority of fever and rash cases are reported from the private health sector and for 2012-2016, the rate of adequate sample collection ranged from 88.9% to 100%. However, challenges remain with shipping samples to CARPHA for testing. Most of the cases were diagnosed as Chikungunya in 2014 and Zika in 2015-2016. There were no confirmed cases of measles or rubella for the period. The coverage, respectively, for MMR1 and MMR2 in 2015 (94%/25%) and 2016 (97.3%/43%) indicates a rise in coverage for both doses. Nevertheless, the MMR2 coverage needs to increase to 95%.

For Trinidad and Tobago, to determine if the current system of syndromic surveillance is adequately monitoring for fever/rash cases, surveillance indicators are used to monitor the performance, quality and safety using specific criteria for MR surveillance such as:

- Number of cases reported
- Percentage adequately investigated within 48 hours
- Percentage with adequate sample
- Percentage of samples sent to CARPHA within 5 days
- Percentage of lab results received from Lab within 4 days

It is evident that the country has not submitted the required number of samples. Based on the challenges experienced in sample collection, data gathering and analysis, there is a need to synchronize and improve collaborations among the EPI, the National Surveillance Unit and the Trinidad Public Health Laboratory to improve monitoring and efficiency of the surveillance system with respect to VPDs.

To sustain measles, rubella and CRS elimination status, the risk of importation of a case must be considered and coverage for measles and rubella maintained at over 95% while attempting to improve the surveillance system.

Report on Confirmed Imported Measles Case in Antigua

The Ministry of Health and the Environment investigated a suspected case of measles in January which was later confirmed. The case, a 19-year-old female tourist visiting Antigua with family and friends was imported from England. Her sibling who had a similar illness was hospitalized in England with measles the same day of her travel to Antigua. Although the case had similar symptoms she was cleared for travel but remained ill in flight. Immediately on arrival in Antigua, she visited an urgent care facility where she was seen by a doctor who prescribed antibiotics, analgesics and antipyretic. Two days later she was seen by another doctor in the hotel, who suspected measles and informed the Ministry of Health. She was

assessed by the public health team and found to be febrile with a temperature of 39.2°C (102.5°F) and with a maculopapular rash. A diagnosis of suspected measles was made. She was isolated and her family members quarantined. The case was subsequently admitted to the hospital as her illness worsened. The case was reported to the following authorities CARPHA: Director of Surveillance Disease Prevention and Control and the team, PAHO/WHO: Sub-Regional Advisor on Immunization and Advisor, Disease Surveillance and Epidemiology.

The WHO IHR focal point was notified and the United Kingdom's IHR focal point was also notified. The investigation was led by the Chief Medical Officer in the Ministry of Health, with technical assistance from CARPHA and PAHO's Caribbean Sub-Regional Advisor on Immunization.

Other members of the family were noted to have been vaccinated and none developed signs and symptoms of measles while in Antigua. Contact tracing was done to include passengers who were on the flight (using a list of persons furnished by the immigration department), persons at the VC Bird Airport, the taxi driver, the two pharmacists, staff members at the urgent care facility, staff members of the hotel and the Emergency Medical staff who transported the case to the hospital. MMR vaccines were given to unvaccinated persons and to those who were not adequately immunized. Public and private physicians, the public health nurses, the media and the public were all alerted and asked to increase surveillance for additional cases. Due to the quick response of the Ministry of Health and the surveillance team the case was contained thus preventing spread to others. No other cases resulted from the imported case of measles.

Country Reports on the Sustainability of Measles/Rubella/CRS Elimination

Barbados and St. Lucia

These countries shared the process and the main elements of their Sustainability Plans for Measles/Rubella/CRS Elimination based on the four strategic lines of action as detailed in the Regional Plan of Action for the Sustainability of Measles, Rubella, and Congenital Rubella Syndrome Elimination in the Americas, 2018-2023. The plans outlined the challenges identified within the strategic areas and the targeted objectives and activities to overcome these challenges. Both countries had completed MMR coverage surveys in 2015 and identified the need to improve both the MMR1 and MMR coverage in every district. This is the main focus of the plan for Barbados. For St. Lucia, activities will also include improving data quality and surveillance. Both countries will also establish and train outbreak rapid response teams.

Process of Accreditation of National Laboratory for Measles and Rubella Testing

Jamaica

Jamaica is the largest country in the English-speaking Caribbean with a population of 2.7 million. Testing for measles and rubella is done outside of Jamaica leading to delays in samples

arriving at the testing site. The fever and rash surveillance indicator for timely arrival at the test site at the Caribbean Public Health Agency (CARPHA) laboratory in Trinidad is consistently low, averaging about 20-30% over the past 15 years. Jamaica contributes to approximately 55-60% of samples to CARPHA for fever and rash, and as such, the Caribbean sub-region has never met this indicator. Accreditation of the National Public Health Laboratory (NPHL) for the processing of measles and rubella samples would not only benefit Jamaica, but islands of the northern Caribbean.

A consultant was hired in 2015 to support capacity building of the NPHL, which entailed training of laboratory technologists for measles and rubella testing utilizing the standardized methodology used at CARPHA. Parallel testing with CARPHA of more than 100 samples for fever and rash revealed that there was 95.4% and 100% concordance of results for measles and rubella, respectively. Refresher training for laboratory staff, finalizing standards operating procedures, and sensitization of laboratory and surveillance staff was conducted in 2016 and 2017 in preparation for accreditation. The accreditation of the NPHL is still pending as gaps have been identified that must be urgently addressed before the accreditation visit. These gaps include the need for continuous testing of samples, implementing in-house quality controls, and purchase of cold chain equipment to store test kits and samples. Close collaboration between laboratory, surveillance and immunization teams is essential to move toward accreditation status in 2018.

Country Reports on Challenges with Surveillance for VPDs with Emphasis on Measles and Rubella and Strategies to Overcome These

Aruba and Curacao

Aruba and Curacao have been facing challenges with their surveillance system for VPDs. The system is primarily a passive system with physicians reporting mainly on syndromes and suspected VPD cases. However, very few cases are being reported, and if so, case investigation is also not done or largely incomplete. Diagnostic testing for measles and rubella is not done in the islands. For Aruba, there has been insufficient collaboration between the different key players within the Department of Health involved in surveillance. But during the last year, this collaboration has improved significantly and information is being shared more effectively. Aruba is currently developing an active syndromic surveillance system including fever/rash and AFP surveillance. Furthermore, the National Ordinance on Infectious Diseases is under final revision and will soon be approved. This will further amplify and modernize the measures needed to strengthen the surveillance system and be compliant with International Health Regulations. For Curacao, only 12 of the 150 general practitioners report cases and no field investigations are done. For example, a case of pertussis was confirmed in 2017 but no investigation done. Also for cases of Guillain-Barre Syndrome, polio is not considered and ruled out with investigations and stool samples. Plans are in place to strengthen VPD surveillance in Curacao in 2018 with the interim appointment of new Department Heads for the Health Department and Infectious Diseases.

Recommendations

Given the increase in measles cases occurring in several countries in Europe and the recent outbreaks in the Americas, there continues to be a high risk of importing and re-establishing endemic transmission of measles and rubella viruses that are a threat to the sustainability of regional elimination. Countries should therefore strengthen efforts to:

- Achieve and maintain $\geq 95\%$ coverage for both MMR1 and MMR2 at national and district levels.
- Guarantee high-quality epidemiological surveillance systems incorporating both the public and private health sectors, with the capacity to promptly detect any suspected measles, rubella or CRS case. Complete and timely investigations including adequate sample collection should also be ensured.
- Implement rapid responses to imported measles, rubella and CRS cases, following standard mechanisms to prevent the reestablishment of endemic transmission.
- Jamaica should finalize its process for accreditation for measles and rubella testing by the end of 2018 and Guyana and Suriname are also encouraged to also build in-country capacity for measles and rubella testing.

SUSTAINING POLIO ERADICATION

Global Polio Eradication and Endgame Strategic Plan – required actions for the final push towards eradication and considerations for fractional IPV

Sustaining Polio Eradication

Although the Caribbean countries have remained polio-free for 36 years, the Caribbean will be part of the global certification process and will have to meet the expected certification standards for surveillance, population immunity and containment.

Until global polio eradication has been certified, to ensure immunity and keep the Caribbean sub-region free of polio, countries must strive to achieve and maintain $\geq 95\%$ polio-3 vaccination coverage at national and district levels.

Countries need to be vigilant for poliovirus importations and of the emergence of cVDPV by achieving and sustaining the following certification-standard surveillance indicators for AFP surveillance:

- 1 AFP case per 100,000 children less than 15 years old
- $\geq 80\%$ cases with adequate samples
- $\geq 80\%$ cases investigated within 48 hours or less
- $\geq 80\%$ cases with 60 days follow-up
- $\geq 10\%$ isolation of other non-polio enteroviruses (NPEV)

In the case of Caribbean countries that do not have a large enough population to expect cases of AFP, it is important that countries do active searches for cases in hospitals to ensure that no case was missed and that the surveillance system remains sensitive.

The Global Certification Commission (GCC) and the Regional Certification Commission (RCC) have requested that all countries submit annual update reports, validated by their National or Sub-Regional Certification Committees, and share the reports with PAHO and the RCC. PAHO is currently finalizing the report template, which will be shared with countries once completed.

Outbreak Response Plans

17 countries in the Caribbean sub-region have submitted Polio Outbreak Response Plans. PAHO evaluated each of these plans using a standardized format and provided specific recommendations. Countries should review PAHO's evaluation, and update their plans accordingly, ensuring that all necessary components are included. Countries should have submitted their updated response plans to PAHO by 30 March 2018. Countries should consider conducting national polio outbreak simulations exercises (POSE) to test their plans with national and sub-national colleagues.

Containment

All the countries in the Region of the Americas are advancing with containment recommendations and have presented at least two containment reports. Five reports of 23 expected have been fully validated for the completeness and reliability of the survey process, and the presence or absence of WPV2/VDPV2/OPV2 and Sabin 2 infectious and potentially infectious poliovirus materials; this includes the Caribbean Sub-regional Containment Report. This means that 17 (49%) member state countries, six territories (100%) and three (100%) associate members have been approved for WPV2/VDPV2/OPV2 and Sabin 2 infectious and potentially infectious poliovirus materials.

In the Region of the Americas, there are a total of seven countries with designated PEFs from Brazil, Canada, Cuba, Chile, Mexico, Panama and the United States; 32 facilities have expressed interest to be a designated poliovirus-essential facility (PEF) and four countries have officially nominated a National Authority on Containment. Panama and Chile declared retaining Sabin 2 potentially infectious material and are pending the *Guidance for non-poliovirus facilities to minimize risk of sample collections potentially infectious for polioviruses*.

The RCC values the important working relationship between the sub-regional Caribbean Certification Committee for Polio Endgame (NCC) and the Caribbean National Poliovirus Containment Coordinators (NCCs). All of the national authorities and the technical teams must continue paying attention to the new orientations/recommendations that may be generated around the Polio Eradication and Endgame Strategic Plan 2013–2018.

Responding to Limited IPV Supply

The two IPV manufacturers that collaborate with the Global Polio Eradication Initiative (GPEI) reported technical challenges in expanding the bulk production of IPV. To respond to the

shortage of IPV, PAHO's TAG has recommended that countries using more than 100,000 doses of IPV each year move to a fractional dose schedule of IPV (fIPV), with fIPV given at two and four months, followed by bOPV.

Given the size of the Caribbean countries, it is not recommended for Caribbean countries to move to a fractional dose schedule at this time. However, all countries, without exception, should reduce IPV wastage, closely monitor IPV stocks, and be prepared to respond to a possible shortage. In case IPV is not available, children should receive bOPV as the first or second dose of the schedule, and receive IPV as a later dose, always respecting the minimum interval of four weeks between doses of the polio vaccine. It is important that healthcare workers clearly record what vaccine was given to each child.

AFP Surveillance in the Caribbean

Global eradication of wild poliovirus is now within reach more than ever but until then, the countries of the Caribbean remain at risk for importation of the disease. The successful global switch from tOPV to bOPV in 2016 has reduced the risk of cVDPV2, but countries must remain vigilant and strengthen surveillance for AFP, which is used as the case definition for suspected poliomyelitis. Efforts to improve population immunity must also be coupled with strengthened surveillance. The last confirmed polio case in the Caribbean sub-region was in 1982. The coverage with three doses of the polio vaccine among children under 1 year of age was 94% in 2016, a decrease of one percentage point from 2015's coverage, which was 95%. Within countries, coverage ranged from a low of 87% to a high of 100%.

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

- To achieve timely, complete, and effective surveillance for AFP.
- To ensure all AFP indicators are met in countries (at least 80% achievement for the indicators)
- 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 18 AFP cases in the <15 years population should be reported from at least 6-7 countries. In 2017, a total of 26 AFP cases were reported from six countries with 80% of the cases being reported from Jamaica, Guyana and Barbados. However, only six or 23% were in children aged 15 years old or less. 69% of cases were aged 15-59 years old. This resulted in a case detection rate of 0.34 per 100,000 population <15 years. This was the lowest rate reported in the past five years.

Fig. 3: AFP Cases Reported in the Caribbean Sub-region, 2012-2017

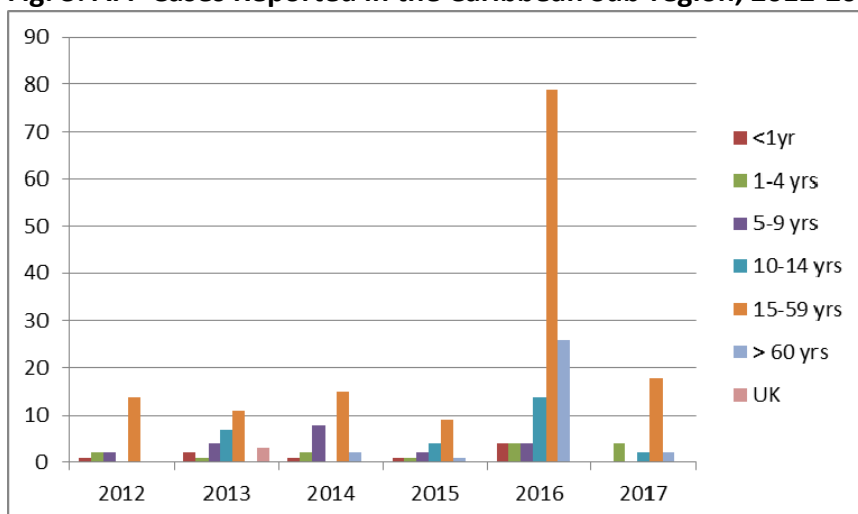
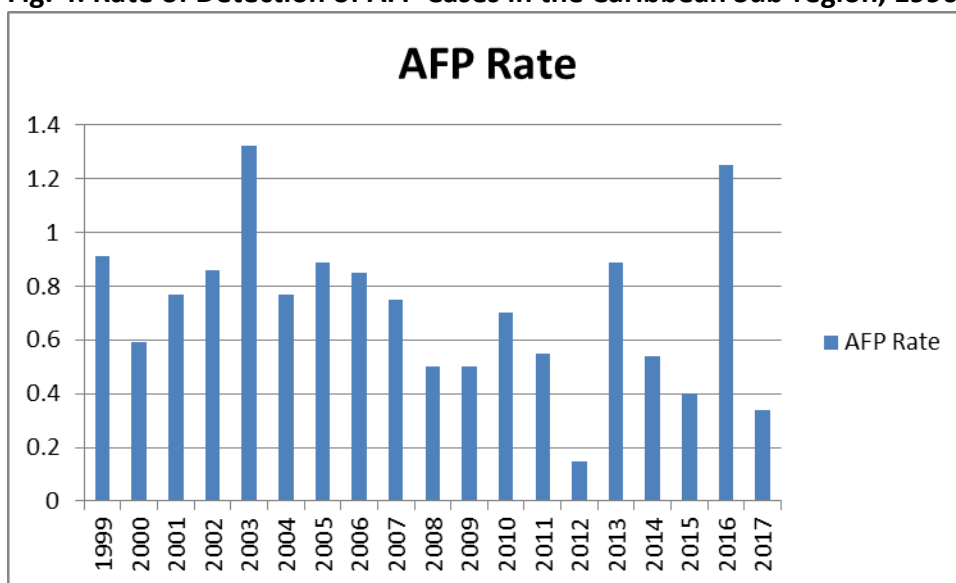
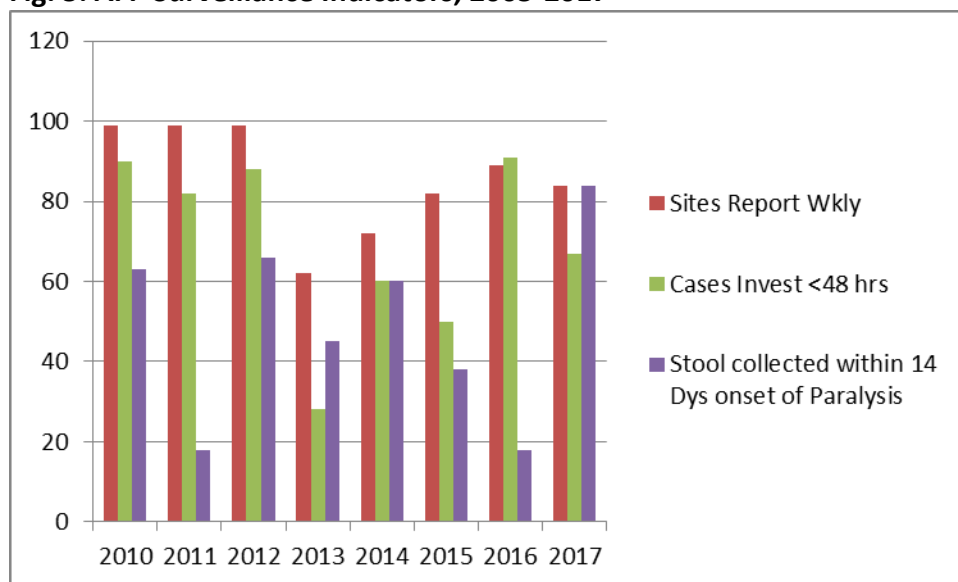


Fig. 4: Rate of Detection of AFP Cases in the Caribbean Sub-region, 1990-2017



The quality of surveillance for AFP cases decreased in 2017 compared to 2016. In 2017, 84% of the surveillance sites for AFP reported on time weekly, only 67% of the cases were investigated within 48 hours and 84% had stool samples submitted to CARPHA within 14 days of the onset of paralysis. 73% of cases were discarded by laboratory methods. The rest were discarded as Guillain-Barre Syndrome or other diagnoses such as Myasthenia Gravis and Transverse Myelitis. No case of polio was confirmed in 2017.

Fig. 5: AFP Surveillance Indicators, 2005-2017



Polio vaccination coverage and surveillance has not met or sustained the required levels to ensure adequate protection of the population and assurance that surveillance is of the highest quality to detect possible cases. Internal evaluation and validation of the AFP surveillance system needs to be done in each country to improve the surveillance indicators and ensure sustainability of polio eradication.

Country Reports on AFP Surveillance and Achievement of Indicators

Belize and Guyana

Both countries shared their achievements and challenges with AFP surveillance. For Belize, polio surveillance has improved with the use of the Belize Health Information System, which provides alerts of AFP cases enabling the public health team to take quick action in investigating the cases. However, there is need to strengthen the surveillance at the community level for the timely identification and notification of cases by the community health workers. In Belize, polio vaccination coverage has declined slightly over the last 5 years and the trend continues to be downward.

Sampling for AFP has been challenging as hospital personnel are not aggressive enough with collecting stool samples for the Public Health Department to facilitate shipment to CARPHA. However, the strategy of leaving sample containers with the patient/family has improved the collection of specimen. Belize has been consistent with investigating all AFP cases and achieving AFP surveillance indicators.

In Guyana, for the period 2012 to 2017, immunization coverage for Polio3 was maintained above 95% until 2015, when it decreased to 92%, but later increased to 94% where it is maintained. Regarding AFP surveillance, the country has met all of the indicators except the

collection of samples (which was 18% in 2016 and 33% in 2017), as well as the interval between collection of samples and arrival at CARPHA. Challenges with AFP Surveillance in Guyana include sample collection from cases, timely shipment of samples to CARPHA, inadequate coordination between the hospital and the EPI, inadequate reporting sites and inadequate surveillance staff within the regions. Recommendations for improving AFP surveillance in Guyana include training for hospital staff both (public and private), designation of staff specifically for surveillance within the regions, partnering with communities and other agencies to assist with surveillance, better coordination for shipment of samples between the Ministry and Guyana Revenue Authority.

Strategies Used to Guarantee Laboratory Polio Containment

The steps and strategies followed and taken by CARPHA, under PAHO/WHO guidelines, towards the final destruction of respiratory and stool samples potentially bearing poliovirus 1, 2 or 3 was shared.

Recommendations

The Caribbean has been polio free since 1982 and has done very well with the implementation of the Global Polio Eradication and Endgame Strategic Plan including maintaining high polio coverage and compliance with polio containment requirements. In order to maintain its polio free status, countries are therefore urged to:

- Keep polio eradication as a political priority.
- Achieve and maintain coverage $\geq 95\%$ in every district.
- Maintain sensitive and quality surveillance systems for AFP.
- Revise National Polio Outbreak Response Plans and submit updated plans to PAHO by 30 March.
- Be prepared to complete annual reports on polio eradication activities once the template is finalized and shared with countries.
- All countries should ensure that they are aware of the laboratory containment requirements and contingency plans, in case of unexpected breaches, and that they are following the WHO recommendations for immunization against polio.

TOWARDS ELIMINATION OF VIRAL HEPATITIS

e-MTCT Plus and Goal of Hepatitis B Elimination in the Americas

According to a recent review, 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%. Most of the Region is considered of low prevalence of HBsAg (<2%), however some areas in Latin America and the Caribbean have intermediate prevalence (between 2% and 4%), and

highly endemic areas, can be found in the Amazon basin, where the prevalence of HBV infection can be over 8%.

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. The estimated regional three-dose series and HB vaccination coverage with the birth dose in 2015 was 89% and 75%, respectively. 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 programs 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 (within the first 24 hours of life).

Caribbean countries/territories have made progress with the birth dose introduction (British Virgin Islands, Belize, Dominica, St. Vincent and the Grenadines, Grenada and Montserrat) in 2017 and some are planning to introduce it soon (Guyana, Jamaica have planned the introduction for 2018-2019 and Haiti is considering its introduction).

The regional platform EMTCT Plus integrates targets and interventions for the EMTCT of HIV, syphilis, Chagas and Hep B. This initiative builds upon the experiences and lessons learned from the EMTCT of HIV and syphilis, already achieved by seven countries in the Caribbean (Anguilla, Antigua & Barbuda, Bermuda, Cayman Islands, Montserrat, St. Kitts & Nevis and Cuba). The EMTCT Plus incorporates immunization as a core intervention to prevent perinatal transmission of Hepatitis B, however, to achieve and sustain the elimination of hepatitis B, additional interventions are recommended and must be considered. This represents a good opportunity to continue and improve inter-programmatic work with focus on strengthening mother and child health systems.

Country Reports on Planning for the Introduction of the routine Hepatitis B Birth Dose

Grenada and Montserrat

Grenada and Montserrat shared their process on introducing the birth dose of Hepatitis B. Both developed introduction plans and ensured adequate supplies of the paediatric formulation of the vaccine. Grenada introduced the birth dose during the week of VWA 2017 administered within 24 hours of birth and up to two weeks for sick/unstable babies. Three refrigerators were sourced, two donated and one purchased for the three public hospitals. Six sensitization sessions were done with both the public and private health care providers and parents were

also sensitized. Special forms were developed to submit the reports and the EIR was updated to ensure data capture. In Montserrat, training for all levels of staff both at the hospital and community was conducted and sensitization of key personnel at the Ministry of Health was done. Training included supervision, cold chain, maintenance, immunization practices and procedures, surveillance of diseases as well as recording and reporting. Strengthening of the surveillance system is one of the expected outcomes of the training with support garnered from the Ministry of Health.

Recommendations

The Region has set an elimination goal for 2020 of MTCT of Hepatitis B. To achieve this goal:

- Countries must introduce the birth dose of Hep B into their routine immunization program, given within 24 hours of birth and achieve and maintain high coverage of >95%.
- Countries where institutional deliveries are not high should complement the institutional birth dose of Hep B by developing strategies for outreach vaccination to newborns.
- Countries must adapt their information systems to capture the timeliness of the birth dose.
- Countries must reach and maintain at least 95% vaccination coverage levels for the three-dose series of hepatitis B vaccine among infants aged <1 year. This three-dose series is in addition to the birth dose.
- Countries must work in an inter-programmatic manner among immunization, maternal and child programs, as well as health services and systems to strengthen maternal and child health and achieve the goals and objectives of eMTCT Plus.

HPV VACCINE

Lessons Learnt from HPV Vaccine Introduction in the Americas

By the end of 2017 in the Region of the Americas, 33 countries and territories had introduced the HPV vaccine (of which 17 are in the Caribbean sub-region) in their national immunization programs and eight countries are using a gender-neutral strategy. The HPV coverage level reported in 2016 varied between 10% and 96% with a median coverage level of 50%-55% (JRF, 2016). The main problems identified in data reports were: not reporting the doses administered or the target population; considering only those enrolled for vaccination or only those vaccinated with the first dose as the target population; not considering cohorts and reporting more adolescents vaccinated with the second dose than with the first.

There are two commonly used strategies for delivering the vaccine: vaccination at health care facilities and school-based vaccination which is considered a special strategy to reach the target population. Nevertheless, this strategy must be complemented by another strategy aimed at reaching those who are not enrolled in school in order to achieve equitable access to the vaccine.

Prior to the introduction of the vaccine, the country should develop a plan to introduce new vaccines, with special emphasis on a communication plan and a crisis plan. Collective sociogenic events have occurred in the Region, and a country's rapid response is essential to maintain the vaccine's credibility. Rumors such as, "HPV vaccine causes serious health problems, infertility and will stimulate girls' sexual activity" may affect the acceptance of the HPV vaccine if not strongly responded to.

Based on these main issues identified, PAHO's TAG in July 2017 recommended some specific actions for HPV vaccination: "TAG reiterates the importance of prioritizing high coverage in adolescent girl cohorts aged 9–14 years to ensure full protection against HPV and induce herd immunity among adolescent boy populations. Currently available vaccines have comparable safety profiles and provide similar protection against cervical cancer. TAG urges PAHO Member States to carefully consider their approaches to communication around the HPV vaccine, making sure to generate audience-specific messages."

Country Reports on HPV Vaccination Introduction

Jamaica and St. Vincent and the Grenadines

Jamaica introduced the bivalent HPV vaccine into the routine immunization schedule in October 2017 via a school-based vaccination program. The target was the cohort of girls aged 11-12 years, starting grade seven in the 2017/2018 academic year (approximately 22,500 girls). A multi-sectoral steering committee and technical working group were established to oversee and coordinate the implementation of activities. Several communication activities were conducted before, during and after the commencement of vaccination sessions. These included national and local sensitization sessions with key stakeholders, development of printed materials and testimonials videos, communication training of healthcare workers (including school nurses), a media forum, radio and television interviews, and social media networking.

The estimated coverage for the first dose administered between October and December 2017 was 22%, with an "opt out" rate of only 11% of girls engaged during the period. The main challenges at the local level were the low response rate for return of vaccination forms and reluctance or refusal of some schools to facilitate the vaccination sessions. At the national level, engagement of a communication consultant dedicated to planning and developing public relations material and events had been challenging. Inertia and push-back from the Ministry of Education, negative public perceptions about the vaccine, and low vaccine acceptance were significant barriers to achieving high coverage. The launch of a robust three-month media campaign planned for March 2018 is the main strategy going forward to ramp up public awareness prior to commencement of vaccination sessions for the second dose in April 2018.

In St. Vincent and the Grenadines, the decision was taken to introduce the HPV vaccine based on the findings and recommendations from the HPV prevalence study done in 2014 and based on the WHO recommendation of a comprehensive approach to cervical cancer prevention and control (community education, social mobilization, vaccination, screening, treatment). It was

decided that girls aged 10-11 years (cohort of girls in grade 6) would be immunized with the bivalent vaccine using a two-dose schedule and the point of administration would be at schools utilizing the established school health program.

Prior to introducing the vaccine, collaboration with relevant stake holders and sensitization sessions with Faith Based Organizations, medical and nursing personnel, Ministry of Education, Senior Management Team of the MOH, parents and teachers at primary schools (February 2017) were done. An HPV marketing campaign to promote the vaccine as a strategy for cervical cancer prevention was also conducted using various media. The media campaign with the message “Save Vincy Girls” was endorsed by gynecologists and the cancer support group. A testimonial from a cervical cancer survivor was also used and a Facebook page was developed. Training of nurses and sensitization sessions in schools and with parents was done in September 2017. Data collection forms and information leaflets were distributed to districts and HPV vaccine administration began on 11 October 2017. A number of challenges were faced – an anti-vaccination group hosted a television program titled “HPV killing Vincy girls.” Social media users and some health professionals also had negative attitudes towards the vaccine. The vaccination strategy was revised and a small team comprised of the health promotion officer, PHN, EPI Manager, gynecologist and a medical doctor was convened to more actively collaborate with the Ministry of Social Mobilization. Town hall meetings were held in almost all communities and messages focused on the theme of “HPV vaccination prevents cervical cancer, is safe and will not harm future fertility.” Results to date are 80 girls vaccinated with 9.5% coverage.

The lessons learnt are that effective community mobilization activities should be implemented at least three months prior to vaccination using multiple channels; face-to-face communication among credible influencers (e.g. teachers, health workers and community leaders), parents, students and communities to enhance support and mitigate rumors; early collaboration with partners/key stakeholders (e.g. cancer society) is important for success; the focus of HPV vaccination must be on cancer prevention and safety of the vaccine. High-level political commitment will contribute to program effectiveness. Early inter-ministerial collaboration is also crucial between the health and education sectors. Attitude actions and beliefs of health care professionals can also determine success. Not responding to anti-vaccination groups with anger, but staying focused and presenting facts is important.

Recommendations

- HPV vaccination is of significant public health importance to the sub-region and countries that have not yet done so, must introduce the HPV vaccine as part of the comprehensive program for the prevention and control of cervical cancer.
- Countries should ensure high political commitment prior to the introduction of the HPV vaccine.
- Early and detailed preparation for introduction is important to address the specific challenges related to HPV vaccination and as such, effective communication with healthcare providers and the general population is needed to ensure vaccine acceptance and high coverage. Countries should consider at least 4-6 months of active communication at the national and field levels with support from communication specialists prior to vaccine introduction.
- Countries should conduct frequent face-to-face trainings on risk communication for healthcare professionals in order to sensitize them to the benefits of HPV vaccination, arm them with the skills to effectively recommend the vaccine to target populations and to prepare them to face any issues that may arise.
- Countries should focus their promotion messages for HPV vaccine on cancer prevention, and effectiveness and safety of the vaccine.

UPDATE ON DIPHTHERIA AND TETANUS VACCINATION

According to the SAGE position paper on tetanus vaccines (February 2017), a three-dose primary series induces protective immunity among almost 100% of vaccinated infants. Although tetanus antibody levels are high after three primary tetanus toxoid containing vaccine (TTCV) doses in infancy, they decline over time. Data from serological studies suggest that a primary series of three TTCV doses in infancy plus a booster during the second year of life will provide 3–5 years of protection. A further booster dose (e.g. in early childhood) will provide protection into adolescence, and another booster during adolescence will induce immunity that lasts through much of adulthood, thus protecting women through their childbearing years. Thus, WHO recommends a three-dose primary series followed by three booster doses as follows:

- The first dose of TTCV should be administered as early as 6 weeks of age.
- Subsequent doses should be given with a minimum interval of 4 weeks between doses.
- The third dose of the primary series should ideally be completed by 6 months of age. Booster doses should ideally be given during the second year of life then at a minimum interval of 4 years as follows:
 - 12–23 months of age;
 - 4–7 years of age;
 - 9–15 years of age.

PROGRAM ACTIVITIES AND EXPERIENCES

Overview of Vaccination Week in the Americas

The 16th Vaccination Week in the Americas (VWA) will be observed from 21 to 28 April 2018, in conjunction with the seventh celebration of World Immunization Week (WIW). Inspired by the 2018 FIFA World Cup Russia™, the regional slogan for this year's campaign will be "Strengthen your defense! #GetVax #VaccinesWork" This slogan is a metaphor that links strengthening one's defense against VPDs through vaccination as a football team would strengthen their defense.

Over the past 16 years, Member States in the Region of the Americas have celebrated VWA, an initiative that has supported and strengthened country immunization programs, and has contributed to the vaccination of more than 720 million individuals of all ages in the Region.

Countries use VWA as an approach to integrate other health promotion and disease prevention interventions with vaccination, as well as a platform to highlight the importance of sustaining the achievements gained through vaccination, including the elimination of five VPDs; the control of pertussis and diphtheria and the introduction of new vaccines.

There is strong commitment from the countries of the Caribbean to carry out VWA activities each year, and tremendous creativity and effort to promote immunization through a variety of public events and social mobilization activities.

Country Reports on Vaccination Week in the Americas

Anguilla, Bahamas and St. Maarten

The fifteenth Anniversary of VWA was celebrated in Anguilla and Bahamas during 22-29 April 2017 using the theme of a birthday party. The regional slogan was "#GetVax to celebrate a healthy tomorrow!"

VWA objectives:

- Promote equity and access to immunization
- Maintain immunization on the political agenda
- Promote transition from child to family immunization
- Serve as a platform for integrated public health activities
- Promote cooperation between countries.

With this mandate, activities were planned and conducted with emphasis placed on social communication. In Anguilla, at one of the health centers a wall was set up to promote the vaccines offered in the immunization program. Staff participated in radio talks, newspaper

articles were printed, and brochures, flyers, t-shirts, bags, wrist bands and hats were distributed in celebration of the 15th anniversary of VWA.

VWA commenced with a church service and this created an opportunity for the general public to be made aware of the planned week of activities. Mop-up vaccination was conducted for incompletely immunized children. Diabetic, hypertensive and foot care services were also offered to the public. The highlight of the week was an immunization parade with a birthday party theme, celebrating 15 years of immunization achievements. This was well supported by the Ministry of Education, Ministry of Health, the children, parents, the general public and the private sector.

Activities to celebrate VWA in the Bahamas took place between March and April 2017. Workshops for healthcare workers were held in some family islands. Immunization for uniformed officers (immigration officers, correctional services and defense force) and sanitation workers was conducted and promotion and administration of the HPV vaccine was done. Additional child health/immunization sessions were conducted during March and April 2017 at the Flamingo Gardens Clinic and public education was enhanced. However, activities were limited due to the general elections which took place in the country at the same time.

St. Maarten planned and executed several activities to celebrate VWA 2017. The initiatives included:

- Several social media communication activities
- A “draw & write short essay” competition
- Two vaccination outreach activities
- Health information sessions for parents and students

Media promotion ranged from radio interviews and flyers to newspaper articles. The draw and essay competition on why vaccinations are important was implemented for primary students grades four and five to promote awareness of the importance of vaccinations and allow students to reflect and gain an understanding as to why vaccinations are of great significance and what can happen if persons in our community are not vaccinated. In May and June 2017, vaccination outreaches were held to target children aged 0-17 years who were not up to date with their vaccinations. Health information sessions were included at these outreaches. An atmosphere of a birthday celebration was used with the hanging of balloons throughout the building and a VWA birthday cake. The participation of the Secretary General and Minister of Health, as well as a good turnout from the public made VWA 2017 a success for St. Maarten.

Recommendations

The meeting Chair commended the Caribbean sub-region for their strong commitment to carry out VWA activities and recommended that all countries and territories:

- Finalize VWA 2018 plans and share with PAHO no later than 15 March 2018.
- Use VWA as an opportunity to garner political involvement and maintain immunization as a political priority and mobilize resources for the immunization program.
- Use VWA as an opportunity to promote positive messages on vaccination, and use communication strategies to counteract the negative effect of anti-vaccination groups.

DATA QUALITY, COLD CHAIN AND PROGRAM MANAGEMENT

EPI Plan of Action – Strategies and Considerations for Planning

Of the 17 Sustainable Development Goals adopted in 2015, goal number three is linked to health; indicator number eight of this goal is to “achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all.” Countries should therefore take advantage of this goal to use immunization coverage as a tracer for achieving universal health coverage. Additionally, the GVAP and the RIAP should be used as a framework for the EPI annual Plan of Action (PoA).

The EPI PoA is a managerial tool for programming and monitoring that helps facilitate the prioritization of activities, while supporting the efficient and timely achievement of objectives and goals. First and foremost, an EPI PoA should be a tool that is useful for national immunization programs and EPI managers, but is also essential to guide PAHO’s provision of technical cooperation to each country and to negotiate with other partners, among other uses.

The process of EPI planning is cyclical and includes the phases of situation analysis, priority setting, formulation of goals and objectives, creation of the plan of action, implementation of the plan, monitoring and supervision and evaluation. PAHO developed an excel matrix as a tool to formulate the plan. The matrix has activities, expected results, time tables and includes more detailed EPI cost information (for those EPI managers that have it at their disposal) and automatically generates multiple graphs to facilitate visualizing costs and tracking expenditures. Analyzing the costs of an EPI PoA is important for numerous reasons, including: resource mobilization (making accurate budget requests that can be defended), understanding the drivers of costs (finding opportunities for greater efficiency), identifying areas of the program with insufficient funds (finding investment opportunities) and planning for expansion (improving the precision of costs estimates for vaccine introduction).

Some challenges have been encountered:

- Inconsistency across the different planning steps;

- Not comprehensive (separate plans for separate EPI components);
 - Prepared by the EPI Manager without participation of other stakeholders
 - Not costed: “wish list” without financial or political backing
- Rapidly becomes irrelevant to the program – becomes a shelf document without consequence;
- Harmonization of data still problematic;
 - Multiple sources with different data
 - Target populations are unknown or keep changing
- Budgeting – unclear or overestimated budget requirements and requests. Difficult to assess real need and prioritize in a climate of limited resources;
- Monitoring and evaluation – the plan should be monitored as a basic function to ensure activities are carried out as planned with quality requirements, and should provide for corrective measures and support timely decision-making to solve problems.

Update on PAHO Revolving Fund and Demand Forecasting for 2018

The PAHO Revolving Fund for Vaccine Procurement for the EPI continues to be a pillar for the achievement of regional immunization goals in the Americas. Through the Revolving Fund, the 41 participant countries and territories in Latin America and the Caribbean access low-priced quality vaccines for their national immunization programs. Annual immunization plans, accurate national-level vaccine demand forecasts, and prompt payments to the Revolving Fund were emphasized as key components to ensure timely supplies.

Country demand forecasting workshops were carried out in South America, Central America and the Caribbean; the PAHO-173 tool has been improved following recommendations from EPI managers. With regards to securing national financing and promptly payments, it was recognized that Anguilla, Bahamas, Belize, Bermuda, Cayman Islands, Curacao, Guyana, St. Vincent and Turks and Caicos, are maintaining or have consistently increased good standing with their Revolving Fund obligations (<60 days). Remarks on applicable policies for country payments to PAHO were discussed. Additionally, countries were informed of PAHO’s decisions to report country statements of account and send invoices electronically, ceasing hard copy deliveries that had previously been the norm.

The Revolving Fund provided an update on the actions being taken to minimize the cold chain excursions occurring through the international transportation process, as well as efforts to reduce the time to provide recommendations on the use of vaccines following excursions.

PAHO is conducting an assessment to identify the priority areas for operational improvements to better serve Member States and to design a blueprint for future services that the Revolving Fund could offer in the future. Progress on the assessment of the Revolving Fund was shared and the Revolving Fund team thanked EPI managers for providing feedback through questionnaires as part of the assessment.

Investigating Cases of VPDs

Pertussis – Belize

Belize shared information on the investigation of a couple of pertussis cases in a Mennonite community. Pertussis continues to surface in Belize from time to time especially in religious communities where vaccination is not widely accepted. Additionally, anti-vaccination groups are increasingly convincing locals to refuse vaccination. The investigation of pertussis cases facilitated reinforcement of the need for vaccination. During outbreaks, vaccine social mobilization is more effective in convincing parents/guardians as is evidenced by these communities that did not accept vaccines now gradually accepting them.

Sampling during the investigation process was not without its challenges as the correct swabs were not readily available and the importance of having the correct materials and supplies available to work with was underscored, as well as the importance of timeliness and precision with the investigation.

Yellow Fever – Suriname

Suriname had not had confirmed cases of yellow fever since 1970. However, in 2016 there was a confirmed case in a Dutch tourist who had visited Suriname, as well as a confirmed case in a Brazilian woman on the border with French Guiana, resulting in death. In 2017, there was also a suspected case in Lelydorp/Wanica but the laboratory result was negative. The cases were notified to or through the International Health Regulations and rapid response teams were convened to conduct investigations. Risk assessments were done in the areas where the cases occurred and forest workers advised regarding their protection and surveillance for dead monkeys. A three-day vaccination campaign for over 3,000 susceptible persons in the eastern part of Suriname was done and doctors and other health personnel were sensitized to the signs and symptoms of the disease and the requirement of reporting on suspicion. The Tourism Association and a popular nature reserve in the interior were advised to alert clients destined for the interior to be adequately vaccinated against yellow fever. Village chiefs and communities were also alerted about the disease. The central laboratory now has the capacity to test for yellow fever and plans are in place to continue mop-up yellow fever vaccination campaigns in high risk areas including in southern Suriname with the border of Brazil.

Maternal Pertussis Vaccination and Newborn Protection in the Netherlands

The Representative from the RIVM in the Netherlands shared information on maternal vaccination to protect newborns against pertussis. In the Netherlands, epidemic peaks of pertussis are observed every two years. The young babies are especially at risk for serious disease. To protect the young babies from pertussis, the Health Council recommended the introduction of maternal pertussis vaccination. This advice was given in December 2015 but the Minister of Health is yet to make the decision. In England, maternal pertussis vaccination was

introduced in 2012 as an outbreak control measure and the results from studies show that vaccine effectiveness was high.

Country Reports on Implementing Recommendations to Strengthen Program Management

Cayman Islands

In 2014/15, the EPI saw major changes in program management with the retirement of both the EPI Manager and the Medical Officer of Health. Both had been spearheading the program for many years. To mitigate potential gaps in EPI delivery and management, technical assistance was requested from PAHO. This was facilitated by an initial visit in 2015 by the Caribbean sub-regional EPI advisor with a follow-up assessment/evaluation visit in November 2017. Following both visits, recommendations were made in the areas of immunization data quality and service delivery, cold chain, VPD surveillance, supervision, monitoring and evaluation. Among the recommendations carried out or in progress are:

- Development of a National EPI Manual (in progress)
- Enhanced immunization monitoring and coverage calculation
- Increased vaccine cold chain capacity
- Addition of selected private sector surveillance sites
- Survey on vaccine hesitancy and missed opportunity (in progress)
- Introduction of web-based national immunization registry.

The Cayman Islands were appreciative of the assessments and commit to implementing the recommendations made to improve the quality of the program.

Cold Chain Assessment and Training in Bermuda

In 2016, Bermuda experienced three cold chain excursions at their central store. Additionally, there were challenges with storage capacity, restricting bulk ordering of vaccines and increased annual shipping costs due to frequent shipments. The increasing demand for additional vaccines also placed a burden on cold chain capacity. This necessitated an assessment of the cold chain in the country, as well as training in the management of the cold chain. The opportunity was also used to install and train persons in the use of the VSSM software for stock management.

Visits were made to 14 public and private health care facilities, including the central vaccine store, and the airport to assess the cold chain facilities and determine adequacy and management. The findings were shared, as well as the recommendation for a dedicated walk-in vaccine cold room of 24 cu meters with 24-hour continuous monitoring and an alarm system, a stand-alone freezer and a new 25KW generator. In the interim, twice daily temperature monitoring, the use of water bottles in refrigerators and the use of vaccine carriers during vaccination sessions were also recommended.

Stock counts and inventory of vaccine and immunization supplies were done to facilitate data entry in the VSSM and training in the use of the VSSM and cold chain management conducted for 14 and 32 participants, respectively from both the public and private sectors. Procurement of vaccine carriers and a continuous temperature monitoring device for the central store are in progress and it is hoped that the cold room will be installed by the end of 2020.

Update on the Progress towards Strengthening Immunization Data Quality and Electronic Immunization Registries (EIRs) in the Americas

The GVAP and RIAP highlight the importance of collecting and collating reliable data to guide operational, managerial and strategic decisions related to immunization. Reliable data is also important to monitor EPI performance and to fulfill the objectives of the GVAP, RIAP and country action plans.

Member States have made great strides in strengthening their vaccination information systems. With support from PAHO, they have worked to improve data quality, availability and utilization.

PAHO's TAG has advised countries regarding data quality and data use since 2014. For operationalizing these recommendations, PAHO considers as main factors: 1) working with countries to facilitate shared experiences and peer-to-peer learning; 2) taking advantage of the sub-regional and regional agreements and definitions.

PAHO has worked closely with countries to develop a document of practical considerations to guide countries in the consideration and implementation of EIRs. Three regional meetings—held in Colombia (2011), Brazil (2013) and Costa Rica (2016)—resulted in the development of this document, which also benefitted from the input of countries from PAHO and other WHO regions with experience in establishing EIRs.

Despite country efforts, problems persist regarding the availability, quality and use of vaccination data to monitor EPI performance indicators. Countries face the challenges of ensuring the availability of systematic, complete and consistent data that respond to the EPI's needs for evaluations (e.g. need to consider all sectors administering vaccines—private, non-governmental organizations, etc.) and to strengthen the collection, analysis and use of data at all levels of responsibility, starting by ensuring that the information systems and tools used (both paper and electronic) are efficient and adaptable to different types of users.

Status of Countries Introducing EIRs

St. Kitts and Nevis and Turks and Caicos

St. Kitts and Nevis and Turks and Caicos both expressed their interest in developing an EIR to strengthen their data quality and by extension, immunization program management. Support was sought from PAHO to assist with development and both countries were subsequently

selected as recipients of the CDC small grant in 2017 as a part of the project to implement an EIR.

This EIR was developed by WHO and adapted and implemented in Grenada in 2015-2016 with funding from a CDC small grant and the country's Ministry of Health. It was anticipated that the EIR in Grenada would be adapted for use in up to three other Caribbean Islands – St. Kitts and Nevis, Montserrat and Turks and Caicos. There is evidence that EIRs can be cost effective tools for increasing coverage, improving the timing of vaccination, and providing reliable data for decision-making. Moreover, an EIR facilitates monitoring the vaccination process in order to optimize related activities. The timeframe for completing the activity was slated for April-November 2017.

Many activities were implemented in preparation for EIR introduction. These included technical support from PAHO and a consultant information technology (IT) officer from Grenada for country visits to discuss the needs and customize the database, training for EPI managers and IT officers and training of 40 end-users in St. Kitts and Nevis in the EIR software and the installation of the adapted EIR in St. Kitts and Nevis. St. Kitts and Nevis completed back data entry of child vaccination records from 2014-2016 and procured 18 computers for the clinics. Activities in Turks and Caicos were delayed due to the passage of hurricanes which affected electricity and the availability of the server. Back data entry has however commenced.

Lessons learnt from this exercise have proven beneficial in ensuring standardization, capacity building in basic computer skills for healthcare workers and the inclusion of the private sector. A formal national launch of the EIR in St. Kitts and Nevis is slated for VWA 2018. Training of end users and implementation in Turks and Caicos will take place in 2018.

Recommendations

- Countries should generate quality data for immunization and encourage data analysis and use at all levels of the immunization program to guide the efforts to maintain high coverage levels and reach the unvaccinated to improve equity.
- Countries should increase efforts towards promoting greater integration of immunization with national health plans and programs in order to place the program in the context of national health priorities.
- To sustain the gains made in immunization, greater focus must be placed on human resource capacity building and programmatic management both at the national and the service delivery levels.
- Countries are urged to improve completeness and quality of data and use the data collected annually for the Joint Reporting Form (JRF) on immunization for reviews and analysis of the program. Monitoring and evaluation should be institutionalized and strengthened.
- With support from PAHO, countries should encourage data analysis and use it at all levels of immunization programs. Data quality may be strengthened by training health workers in the analysis of vaccination coverage, monitoring vaccine administration and supply, following up on target populations, identifying inequalities in vaccination access, and performing complementary analyses linking EPI data to other data sources such as household surveys.
- Countries should reinforce use of the basic tools available, such as clinic index cards, tracking registries and take-home vaccination cards, ensuring the latter are adequately completed, as well as work towards the effective implementation of the use of more complex tools like EIRs with full participation from the private sector.
- Countries and PAHO should share experiences and best practices for improving data quality and use.
- Countries should use the annual planning process to expand the scope of advocacy and communications for immunization.
- Countries are encouraged to remain committed to the PAHO Revolving Fund and improve their demand planning process using the standardized tool (PAHO 173).
- Countries with continuous arrears exceeding 60 days are undermining timely access to vaccines and supplies and the sustainability of their immunization programs. The financial performance of countries with the Revolving Fund will be reviewed at the Caribbean states meeting prior to the Directing Council in September 2018.

IMMUNIZATION IN EMERGENCY SITUATIONS

EPI Preparedness and Response in Emergency Situations in the Caribbean Region

The Caribbean is historically known to be at risk for natural disasters, especially hurricanes. Proper planning and preparedness policies are important for risk management and mitigation. Preparedness should aim to preserve the cold chain, secure vaccine stocks, equipment and records and staff must be adequately trained or sensitized to their roles/responsibilities for

preparedness and response. Countries are reminded that the best way to prevent VPD outbreaks during emergencies is to maintain high population immunity through routine immunization.

Framework for Decision-Making on Immunization in Emergency Situations

Countries can refer to the existing guidelines on humanitarian responses for guidance and use the framework for decision-making on vaccination in situations of humanitarian emergencies, endorsed by SAGE in 2012. Countries should seek to prevent VPD outbreaks with high morbidity/mortality rates and minimize the risk of reintroduction of VPDs eliminated in the Region. Thus, these considerations are particularly important for measles, rubella, polio and tetanus (and yellow fever in enzootic zones). Vaccination of the humanitarian assistance teams should also be prioritized. It is crucial to restore routine vaccination as soon as possible during responses to emergencies.

Cold Chain, Supply Chain and other Logistical Considerations in Emergency Situations

Different options to maintain an effective cold chain in an emergency to protect vaccines in the Caribbean Region of the Americas were explored. Because of the differing natures of emergencies that the countries of the Caribbean may encounter in any given year, there are different plans that a country can consider. Each approach will require fewer or more investments including training costs and recurrent costs if the emergency plan is to maintain the cold chain under any condition that constitutes an emergency. The only exception could be a severe hurricane (category 5) or a severe earthquake.

The success in operationalizing one's plan for mitigating the effects of an emergency on the cold chain will depend on how well authorities have improved the existing and/or surge capacity abilities to receive, store and distribute vaccines and ancillary items, as well as the interoperability of communication systems across all agencies to allow the free flow of data and information up and down from the command and control center to the lowest service levels and execution of regular training events given new technologies and turnover of staff.

Whenever cold chain equipment is out of order for less than three days in any health service facility, health workers can temporarily store the vaccines in vaccine cold boxes, vaccine carriers (with properly conditioned of water icepacks); they can also store the vaccines in other facilities that have good refrigeration equipment. If the health authorities determine that cold chain equipment at any health service will require more time to repair or replace, then consideration must be given to moving the vaccine stock to a more central health facility with sufficient space to temporarily store the vaccines.

Health authorities should have previously pre-determined the health facilities that can serve as vaccine depots or build a regional vaccine depot. In both cases these depots must have gas-driven generators that can provide back-up energy to assure that it can power the equipment for safe storage of the vaccines. Most countries in Latin America have established both national

and sub-regional vaccine stores with back-up generators to receive, store and distribute vaccines. The storage capacities vary from three months of vaccines or more.

Some Caribbean countries have national stores with back-up generators; some countries have sub-regional stores, depending on the size of the country; but more importantly, if the national store receives its entire annual order at one time early in the year, it is recommended that these countries install back-up gasoline generators to ensure long term safe vaccine storage. This will permit the authorities to safely store vaccines for long periods of time in almost any emergency.

During an emergency that causes catastrophic damage to an entire island or a catastrophic earthquake that impacts an entire region/country where the buildings and roads are destroyed and/or the electrical grid is totally brought down, there is little that can be put into place previously to safely continue to store vaccines.

One approach to mitigating the effects of an emergency due to a catastrophic event is to establish a vaccine depot in another country, outside the Caribbean region. But this is very complicated because of operational costs, contractual agreements with all parties and the country where this is located. PAHO considered this many years ago for other reasons, but dismissed this possibility for the reasons mentioned above.

Role of PAHO's Revolving Fund in Emergency Situations

Under emergency situations such as stock-outs, VPD outbreaks or natural disasters, PAHO's Revolving Fund has supported affected countries with rapid supply of needed vaccines and supplies. The Revolving Fund facilitates borrowing vaccines from one country to another; however, this process might not always be the most rapid response, due to the required communications and approvals required between countries.

Most of the time, purchasing through the Revolving Fund is the faster way to obtain the required vaccines and/or syringes. The Revolving Fund supply agreements and the capital fund (credit line) are some of the features facilitating prompt order placement and delivery.

Routes for the vaccine and syringe delivery by air from suppliers to most of the destinations in the Caribbean are well-established; nonetheless, when airports are inaccessible or out of use during emergencies or times of disasters, there are difficulties in guaranteeing the cold chain during transportation by sea from neighboring islands and in transporting small quantities of vaccines from suppliers. To address these difficulties, establishing alternative delivery points from where the final consignee can collect the product might be considered.

Current Challenges and Needs of Affected Countries and Plans for Future Preparedness

British Virgin Islands and Dominica

Both countries shared their experiences regarding the impact of the recent hurricanes on their health systems and the implementation of vaccination after the hurricanes. In both countries, damage to the primary health care facilities was moderate and in Dominica, 29 (59%) of health facilities were minimally damaged, 7 (14%) were moderately damaged and 13 (27%) were severely damaged. The hospital in British Virgin Islands (BVI) was not affected, but in Dominica the hospital was severely damaged reducing the bed capacity from 220 to 90. There was no vaccine loss in BVI but Dominica lost all their vaccine stock as the central cold store at the hospital was compromised.

Dominica was more severely impacted by the hurricane, as it lost 20 vaccine refrigerators and suffered a shortage of nurses. There was also an increase in gastroenteritis caused by Shigella and Norovirus as well as respiratory infections. Sample collection was affected due to challenges with transportation and poor road conditions. The sewage system was damaged and the abundance of municipal waste is a growing concern.

In both countries, electricity and water supplies in rural and peri-urban areas remain disconnected and telephone communication and internet services remain problematic, thus impacting surveillance. Several homes and government buildings remain in a state of disrepair and some health centers are still not in operation.

In Dominica, there has been an increased demand for management of injuries and orthopedic surgeries and non-communicable diseases are uncontrolled with increased hospital admissions due to complications. In both countries, the need for DT vaccines increased immediately after the hurricane. Psychosocial support needs have also increased.

Both countries expressed the need for solar-powered refrigerators, especially at the central level and in some districts. Dominica also expressed the need for HAM radios in all health districts and staff trained to use same, as well as 4x4 vehicles.

Recommendations

- To mitigate against vaccine loss during times of disaster, countries are urged to ensure policies are in place to centralize vaccines and supplies in secure facilities with an alternate source of power.
- Countries should ensure high vaccination coverage in every district, as well as vaccination of humanitarian assistance teams, as necessary, to prevent VPD outbreaks in the aftermath of disasters.
- To ensure continuity of the immunization program after disasters, country preparedness activities should aim to preserve the cold chain, secure vaccine stocks, equipment and records and staff must be adequately trained or sensitized to their roles/responsibilities.
- Storage facilities with alternate sources of power should be previously identified and should be strategically placed throughout the country to ensure timely distribution of vaccines and supplies after disasters.
- Countries should consider the PAHO Revolving Fund for the rapid supply of needed vaccines and supplies under emergency situations such as stock-outs, VPD outbreaks or natural disasters; special attention should be paid to the lead times for ordering supplies.

PRESENTATION OF COUNTRY PLANS OF ACTION AND VWA WORKBOOKS FOR 2018

The five working groups shared summaries of the 2018 country PoAs for the EPIs, as well as the activities planned for VWA 2018. Many countries indicated the desire to implement EIRs, plans to introduce the birth dose of Hep B and HPV vaccines, strengthen VPD surveillance and mop-up MMR vaccination among other activities.

PRESENTATIONS OF AWARDS

Surveillance Shield

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

- Timeliness of reporting
- Percentage of sites reporting
- Number of fever and rash cases reported compared to the expected
- Rate of fever and rash cases
- Adequacy of investigation of reported cases
 - Percentage with blood samples
 - Percentage with adequate investigation
 - Level of completeness of investigation forms
- 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 2017, the surveillance award was presented to Anguilla. Awards for the second and third places went to St. Kitts and Nevis and St. Vincent and the Grenadines, respectively.

The Henry Smith Cup

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 whose EPI has made the most improvements in the past year. This award was presented to St. Kitts and Nevis based on their 2016 coverage.

CLOSURE OF MEETING

Participants at the 33rd Caribbean EPI Managers' Meeting sincerely congratulated the countries for being recipients of awards and extended their compliments to all their health workers for their continued dedicated and outstanding performance during the past year. The meeting chair and PAHO representatives acknowledged once again the unstinting dedication of EPI staff across the Caribbean, with special recognition for EPI managers of countries affected by the hurricanes for their extraordinary commitment to the program. Certificates of appreciation were sent to past EPI managers with the country representatives.

Fig.6: Participants at the 33rd Caribbean EPI Managers' Meeting, Trinidad and Tobago

