Technical Advisory Group on Vaccine-preventable Diseases (TAG)
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TAG 2015
Technical Advisory Group on Vaccine-Preventable Diseases

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TAG Members

Dr. J Peter Figueroa **TAG Chair**
Professor Public Health, Epidemiology & HIV/AIDS
University of the West Indies
Kingston, Jamaica

Dr. Jon K. Andrus
Executive Vice-President
Vaccine Advocacy & Education
Sabin Vaccine Institute
Washington, DC, United States

Roger Glass
Director
Fogarty International Center & Associate Director for International Research, NIH/JEFIC-National Institutes of Health
Bethesda, MD, United States

Dr. Akira Homma
Chairman of Policy and Strategy Council
Bio-Manguinhos Institute
Rio de Janeiro, Brazil

Dr. Arlene King
Adjunct Professor
Dalla Lana School of Public Health
University of Toronto
Toronto, Ontario, Canada

Dr. José Ignacio Santos
Professor
Experimental Medicine Unit
Faculty of Medicine of the National Autonomous University of Mexico
Mexico City, Mexico

Dr. Anne Schuchat*
Director
National Center for Immunization and Respiratory Diseases
Centers for Disease Control and Prevention
Atlanta, GA, United States

Dr. Anushua Sinha
Associate Professor
Rutgers School of Public Health
Newark, NJ, United States

Dr. Jeanette Vega*
Director
Chile's National Health Fund
Santiago, Chile

Dr. Cuauhtemoc Ruiz Matus
Unit Chief, Comprehensive Family Immunization — *Ad hoc* Secretary
PAHO/WHO
Washington, DC, United States

*** Not present at TAG 2015**

Acronyms

AD	Auto-Disable Syringes
AFP	Acute Flaccid Paralysis
AMR	Region of the Americas (under World Health Organization)
BCG	Bacillus Calmette-Guérin (vaccine against severe forms of tuberculosis)
BP-BM	Bacterial Pneumonia-Bacterial Meningitis
BP	Bacterial Pneumonia
BM	Bacterial Meningitis
bOPV	Bivalent Oral Polio Vaccine
CAP	Community-Acquired Pneumonias
CDC	Centers for Disease Control and Prevention of the United States
CLAP	Latin American Center of Perinatology
CRS	Congenital Rubella Syndrome
cVDPV	Circulating Vaccine-derived Poliovirus
DPT	Diphtheria-Pertussis-Tetanus vaccine
DPT3	Third dose of the Diphtheria-Pertussis-Tetanus vaccine
EMTCT	Elimination of Mother to Child Transmission
EPI	Expanded Program on Immunization
ESAVI	Event Supposedly Attributable to Vaccination or Immunization
FLASOG	Latin American Federation of Obstetricians and Gynecologists
GHSS	Global Health Sector Strategy
GPEI	Global Polio Eradication Initiative
GVAP	Global Vaccine Action Plan
HBIG	Hepatitis B immune globulin
HBV	Hepatitis B Virus
HCC	Hepatocellular carcinoma
Hi	*Haemophilus influenzae*
Hib	*Haemophilus influenzae* type b
HIV	Human Immunodeficiency Virus
HPV	Human Papilloma Virus
ICG	International Coordination Group
IEC	International Expert Committee (for the documentation and verification of measles, rubella, and Congenital Rubella Syndrome elimination in the Americas)
IPV	Inactivated Polio Vaccine
ISO	International Organization for Standardization
JRF	PAHO-WHO/UNICEF Joint Reporting Form on Immunization
LAC	Latin America and the Caribbean
MCV1	First dose of the measles-containing vaccine
MIC	Middle Income Countries

MIG	Maternal Immunization Group
MNTE	Maternal and Neonatal Tetanus Elimination
MMR	Measles-Mumps-Rubella Vaccine
MOV	Missed Opportunities for Vaccination
M&E	Monitoring and Evaluation
NIP	National Immunization Program
NITAG	National Immunization Technical Advisory Group
NNT	Neonatal tetanus
NPCC	National Polio Containment Coordinator
OCV	Oral Cholera Vaccine
OPV	Oral Polio Vaccine
OPV2	Oral Polio Vaccine, 2nd dose
PAHO	Pan American Health Organization
PEESP	Polio Eradication and Endgame Strategic Plan
PCR	Polymerase Chain Reaction
PCV	Pneumococcal Conjugate Vaccine
RCC	Regional Certification Committee
RF	PAHO's Revolving Fund for the Purchase of Vaccines and Immunization Supplies
RIAP	Regional Immunization Action Plan
RIVS	Regional Immunization Vision and Strategy
RSV	Respiratory Syncytial Virus
RVA	Rotavirus group A
RV1	Rotavirus type 1
SAGE	Strategic Advisory Group of Experts on Immunization (for the World Health Organization)
SH	Southern Hemisphere
SIA	Supplemental Immunization Activity
Spn	*Streptococcus pneumoniae*
SUDS	Single Use Disposable Syringes
TAG	Technical Advisory Group on Vaccine-preventable Diseases
Td	Tetanus-diphtheria vaccine
Tdap	Tetanus Toxoid Acellular Pertussis Vaccine (for adolescents and adults)
tOPV	Trivalent Oral Polio Vaccine
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
V3P	Vaccine Product, Price and Procurement Platform
VAPP	Vaccine-Associated Paralytic Poliomyelitis
WASH	A nonprofit, nonpartisan initiative dedicated to helping solve the global safe drinking Water, Sanitation, and Hygiene challenge
WHA	World Health Assembly
WHO	World Health Organization
WPV	Wild Poliovirus

Introduction

The XXIII Meeting of the Technical Advisory Group (TAG) on Vaccine-preventable Diseases of the Pan American Health Organization (PAHO) was held in Varadero, Cuba on 1-3 July 2015.The slogan for the meeting was “Bye-bye rubella! Let’s go for more!” selected in recognition of the recent certification of the regional elimination of rubella and Congenital Rubella Syndrome (CRS). The objectives of this meeting were to present the Regional adaptation of the Global Vaccine Action Plan (GVAP), to review progress on several disease elimination and control initiatives and issue recommendations to address the many challenges faced by national immunization programs in the Americas.

PAHO’s Assistant Director, Dr. Francisco Becerra, welcomed everyone and gave introductory remarks. Following Dr. Becerra, Dr. Peter Figueroa, was introduced as the newly appointed TAG Chair, a role he served in interim during the XXII TAG meeting after the passing of the former chair Dr. Ciro de Quadros. Dr. Figueroa is a former member of the World Health Organization’s (WHO) Strategic Advisory Group of Experts on Immunization (SAGE) as well as a TAG member since 1991, and he will now preside as PAHO TAG Chair for the next four year term.

This XXIII Meeting of the TAG was different from past meetings in many ways. The first was that this year’s TAG was the first Regional immunization meeting of its size and magnitude to be hosted in Cuba. The second was that it was the first TAG to be presided by the newly elected TAG President, Dr. Figueroa. Last but not least, this XXIII TAG Meeting was the first time the Regional Immunization Action Plan (RIAP) was officially presented to the TAG and all PAHO Member States.

This plan has been approved by PAHO’s Executive Committee and will be presented to the Directing Council in September 2015. The RIAP provides an outline for the next five years, serving not only as the Regional adaptation of the GVAP but also as the official Regional Strategy and Plan of Action (2016 – 2020). The introduction of the RIAP arrives to reinforce the Expanded Program on Immunization’s (EPI) foundations and provide additional guidance for meeting the ever increasing challenges faced by programs in the Region. The RIAP has four strategic lines of action: a) sustain the achievements; b) complete the unfinished agenda in order to prevent and control vaccine-preventable diseases; c) tackle new challenges in the introduction of vaccines and assess their impact; and d) strengthen health services for the effective vaccine administration. Finally, the RIAP intends to successfully guide PAHO Member States through second half of the Decade of Vaccines.

Regional Immunization Action Plan

Since the inception of the Expanded Program on Immunization (EPI) 38 years ago, countries and territories in the Americas have made significant strides in protecting their populations against vaccine-preventable diseases. Many Member States consider immunization a public good and a political priority; national immunization programs have also contributed significantly to the progress towards reaching the Millennium Development Goals.

From 2005-2013, coverage with the third dose of DPT reached a sustained 90% or higher on average in the Region; however, coverage has stagnated in recent years. Provisional data for 2014, however, shows that regional DPT3 coverage dropped to 88%[1]. As of 2013, the Americas ranked third in DPT3 coverage, when compared to other regions of the World Health Organization. The Region has remained on the forefront in the sustainable introduction of new vaccines; to date, 24 countries and territories have introduced the pneumococcal conjugate vaccine, 18 countries and territories have introduced the rotavirus vaccine and 22 countries and territories have introduced the vaccine against human papilloma virus. In 2015, the elimination of rubella and Congenital Rubella Syndrome (CRS) was officially declared and – with the exception of Haiti – neonatal tetanus is no longer a public health problem in the Region.

The work of national immunization programs protects individuals across the life cycle from deadly diseases and related suffering and the success of a program is based on strong performance across a multitude of areas, activities and strategies, including country ownership and financial sustainability by securing the political priority of the program and a legal framework for immunization, careful planning and coordination, procurement of a safe and uninterrupted supply of vaccines and injection supplies, maintenance of the cold chain, training, supervision and monitoring, epidemiological surveillance and laboratory capacities, and communication and social mobilization. The efforts of national immunization programs also do not happen in isolation; they are instead an integral part of national health systems and contribute to the achievement of universal health coverage.

Upcoming immunization challenges facing the Region are numerous and include: certifying the elimination of the endemic transmission of measles; adding a dose of the injectable polio vaccine and switching from the use of tOPV to bOPV, in accordance with the Polio Eradication and Endgame Strategic Plan, 2013-2018; overcoming a limited global supply of certain biologicals, identifying better strategies to reach vulnerable populations at the local level and improve coverage and improving the quality of immunization data and its use for decision-making and strategic intervention.

In order to provide strategic guidance to confront these challenges and achieve technical excellence, an overarching regional framework for immunization is critical. Over the last eight years (2007-2015), PAHO's Regional Immunization Vision and Strategy (RIVS) – approved by the 50th annual Directing Council through Resolution CD50.R5 – has served this purpose, as the strategic roadmap for national immunization programs across the Region.

In 2010, the global health community began work on the Decade of Vaccines Collaboration, with the goal of establishing the global vision for national immunization programs through the year 2020. This participatory, multifaceted effort culminated in the development of the Global Vaccine Action Plan

[1] Provisional data as of 26 June 2015.

(GVAP), which was subsequently endorsed by the World Health Assembly in May 2012 through resolution WHA65.17. As part of this process, it was established that all regions of the World Health Organization would be responsible for adapting the GVAP to fit their own specific and unique contexts.

In October 2012, the contents of the GVAP were presented to the TAG and it was reaffirmed that the Region would move forward in tailoring the global goals and strategies to the fit the needs of Member States in the Americas; this new Regional Immunization Action Plan (RIAP) will extend the RIVS framework when it expires in 2015 as the strategic document for immunization in the Americas. During the TAG meeting in July 2013, an additional presentation was given on the GVAP framework for monitoring, evaluation and accountability; this framework set forth a global structure for regular monitoring of the GVAP at all levels of implementation, including global, regional and national levels.

In anticipation of the transition from the RIVS to the GVAP adaptation for the Americas, the PAHO Secretariat has developed a proposal for the Regional Immunization Action Plan (RIAP) that was presented during the 156th session of the PAHO Executive Committee in June 2015. The RIAP will now be presented at the 54th Directing Council in September 2015 for the consideration of all Member States. The draft proposal was the product of a wide consultation process over the past year. The proposed strategies, objectives and monitoring framework were developed considering PAHO's Strategic Plan 2014-2019, as well as other regional and global level action plans, including the Polio Endgame. Within the Region, EPI managers and PAHO immunization focal points have provided feedback to align the document with the current challenges faced at the national level to move the immunization agenda forward. Other key partners have provided additional comments on the targets and monitoring framework proposed.

Through its four strategic areas of work, the RIAP 2016-2020 aims to provide Member States with the justification, guiding principles, objectives, and monitoring and evaluation (M&E) frameworks to enable national immunization programs in the Region to align successfully with the GVAP and implement strategies to ensure that all citizens of the Americas will benefit from immunization, regardless of where they are born, who they are, or where they live, until 2020 and beyond. The RIAP also encourages countries to take a more active role to achieve universal health coverage and address inequities and social determinants of health to ensure the protection of all individuals against vaccine-preventable diseases.

Recommendations:

- TAG commends countries for the significant achievements and health gains of their immunization programs, in particular the certification as the first Region to have eliminated rubella and the Congenital Rubella Syndrome.
- At the same time, TAG notes with grave concern the decrease in DPT3, Polio3 and MCV1 coverage in the Americas at national, subnational and municipal levels in recent years. Therefore, TAG calls on countries and PAHO to recommit themselves to universal immunization coverage, based on the principles of equity and solidarity, in the context of achieving universal health coverage for all.
- The TAG endorses the Regional Immunization Action Plan as the overarching regional framework to realize the vision of well-integrated, comprehensive immunization programs in the countries of the Americas.
- TAG urges Member States and PAHO to sustain health gains, prevent the reintroduction of controlled or eliminated diseases, and successfully implement the RIAP.

- TAG recommends that the health benefits, economic benefits, and cost-effectiveness of immunization in the Americas be clearly documented for policy makers, so that they fully appreciate the compelling case for investing in national immunization programs and how these benefits are linked to achieving GVAP goals.
- TAG urges PAHO to develop a communication strategy, in order to better educate the people in all sectors of society of the Americas regarding the value of immunization, to promote the demand for vaccination and its recognition as a social responsibility, and the consequences of not sustaining high coverage in terms of lives, disease, and costs.
- TAG urges Member States to identify unvaccinated populations and reach them through prioritizing the most vulnerable, including populations living in remote, peri-urban and/or border areas and belonging to special social groups (i.e. indigenous communities) in order to diminish inequities in health.
- TAG urges Member States to analyze their own data at the national, regional and local level in order to generate strategies to strengthen the routine immunization program and monitor the implementation of the RIAP/GVAP.
- TAG urges PAHO to identify ways to provide technical assistance and mobilize additional funding to support country efforts to implement the RIAP/GVAP, with an emphasis on improving coverage from the local to the national level and introduce new vaccines, where the evidence indicates. TAG urges Member States to assure adequate resources to strengthen the foundation of NIPs.

Global and Regional Initiative for Polio Eradication Update

In May 2012, the 65th World Health Assembly adopted a landmark resolution declaring the completion of poliovirus eradication a "programmatic emergency for global public health." In response, the WHO Executive Committee approved the *Polio Eradication and Endgame Strategic Plan 2013-2018 (PEESP),* which provides a detailed approach and concrete timeline for complete polio eradication.

There has been significant progress at the global and regional level in the implementation of the four key strategic objectives: 1) detect and interrupt all poliovirus transmission; 2) strengthen immunization systems, introduce the inactivated polio vaccine (IPV), and withdraw oral polio vaccines (OPV); 3) certify the eradication and containment of all polioviruses; and 4) assure that the polio investment will benefit other long term public health goals.

Progress made on the implementation of the PEESP objectives at the global level

In 2014, 359 cases of paralytic polio due to wild poliovirus (WPV) were reported, 95% occurred in the three endemic countries: Pakistan, Afghanistan and Nigeria. Pakistan notified 85% of the total confirmed cases. 19 cases occurred in 6 countries that were previously free of polio. Nigeria has not reported any wild poliovirus cases since 24 July 2014.

The South-East Asia Region, which includes India, was certified a polio-free Region on 27 March 2014. With this achievement, 80% of the world's population now lives in polio-free regions. However, the continued detection of cVDPV type 2 in environmental samples from Nigeria and Pakistan and polio cases caused by cVDPV type 2 have been detected in Pakistan in December 2014, and in Nigeria, with onset on 16 May 2015 are of concern.

The last case of WPV-type 3 was notified in Nigeria in November 2012. Since then, WPV-type 1 has caused all polio cases.

Strong progress towards polio eradication has been seen in 2015, with more and more children in the remaining endemic countries now fully protected from lifelong polio paralysis and in turn a declining number of global WPV cases. However, coverage levels are still not optimal, especially in insecure and politically unstable areas. As long as the disease remains anywhere, children everywhere are at risk.

On 5 May 2014, the WHO Director General declared the international spread of WPV a public health emergency of international concern and issued temporary recommendations on measures to reduce the risk of international WPV spread, like managing the event as a national public health emergency and vaccinating travelers from affected countries. The temporary recommendations were extended in August 2014, November 2014, February 2015, and April 2015. Currently, Pakistan is the only country exporting the virus, a significant improvement from 2014.

To comply with the guidelines of the PEESP, all countries in the world will need to introduce at least one dose of IPV in their routine immunization program by the end of 2015, in preparation for the switch. Currently, all countries have committed to do this, and introductions are underway, with almost 20% of all scheduled introductions already completed. The constrained IPV supply will be the major challenge in meeting this target.

The switch or the replacement of all trivalent oral polio vaccines (tOPV), which contain vaccine-poliovirus types 1, 2 and 3, to bivalent oral polio vaccines (bOPV), which contain vaccine-poliovirus types 1 and 3, is tentatively scheduled to occur in April 2016 during a two-week window that will be defined by SAGE in October 2015. SAGE recommended the switch because WPV type 2 has not been detected since 1999, and now tOPV generates more risks than benefits and undermines global polio eradication. Around 90% of polio cases due to cVDPV and a third of all vaccine-associated paralytic poliomyelitis (VAPP) cases are caused by poliovirus type 2.

As of 1 May 2015, 87 (45%) of the 194 WHO Member States already use IPV in their routine immunization schedules, 103 (54%) have formal commitment to introduce IPV in 2015, and 4 (2%) countries have informally indicated plans to introduce IPV in 2015.

All of the 156 countries and territories in the world that currently use tOPV should be preparing national plans for the switch following the WHO guidelines. A draft plan should be ready by the end of July and finalized by September 2015.

The WHO has a global action plan (GAPIII) to minimize poliovirus facility-associated risk after polio eradication that includes the containment of all polioviruses: wild, VDPV and Sabin. This containment plan is sequential and will begin with the containment of WPV-type 2 by December 2015, followed by the containment of Sabin poliovirus type 2 by July 2016. The final containment of all wild poliovirus is tentatively planned for 2019 before bOPV cessation. All Sabin polioviruses type 1 and 3 will be contained after the interruption of bOPV.

Countries are developing a plan to ensure that investments made during polio eradication will continue to benefit other development goals in the long term. Careful planning is essential to ensure that lessons learned during polio eradication, as well as the assets and infrastructure built in support of the effort, are transitioned responsibly to benefit other development goals and global health priorities.

Progress made on the implementation of the PEESP objectives at the regional level

The Region of the Americas reported the last case of polio in 1991 and was certified as a polio-free Region in 1994. In the last 20 years since the certification of eradication, the Region has had only one outbreak of circulating vaccine-derived poliovirus (cVDPV), which occurred in Haiti and the Dominican Republic, between 2000 and 2001.

To maintain polio eradication, countries should continue the surveillance of acute flaccid paralysis (AFP) cases in children under 15 years because AFP surveillance is considered the gold standard in polio surveillance. Additionally, countries should implement strategies to achieve and maintain high vaccination coverage against this disease. However, the Region of Americas is not achieving all of the surveillance quality indicators. Similarly, vaccination coverage varies among countries, only 15 countries reach 95% or more of polio coverage and regional coverage has been declining in recent years.

Environmental surveillance could complement AFP surveillance in high risk areas. The Region of the Americas is considering the feasibility and opportunity costs of implementing environmental surveillance in a couple of countries. However, due to the high resource demand of implementing these activities, a careful cost-benefit analysis should be carefully considered.

The notification rate of at least 1 case of AFP per 100,000 children under 15 years has been achieved every year since 1986; the percentage of cases with adequate stool samples obtained within 14 days of the onset of paralysis, which should reach at least 80%, has varied from 73% to 79% over the last 10

years; and the percentage of AFP cases investigated within 48 hours after notification, which should reach 80%, declined in 2013 (61%) and has increased again in 2014 (75%), although not reaching the recommended target. During 2014, only two countries in the Region met these three indicators: Mexico and Nicaragua.

Regional vaccination coverage against polio, which reached 94% in 2011, has declined over the past three years, falling to 87% in 2014. In 2013 and 2014, most countries did not reach polio vaccination coverage of 95% and several countries in the Region had coverage under 90%.

To fulfill the guidelines of the PEESP, and in preparation for the switch from tOPV to bOPV, the countries of the Region will be introducing at least one dose of IPV by the end of 2015 in their routine immunization program as part of a sequential schedule: IPV followed by OPV. To date, of the 46 countries and territories of the Americas, 15 are already using IPV in their routine immunization programs and 30 have official commitment to introduce IPV by the end of 2015. To date, only Curacao maintains the plan to introduce IPV in January 2016.

Following OPV2 cessation, there will be a relatively higher, but time-limited, risk of the emergence of cVDPV and for this reason, all countries must maintain sensitive surveillance systems in order to rapidly detect and interrupt any circulating poliovirus.

The countries of the Region have received guidelines to develop switch plans and should have already started working on their plan to ensure that all requirements for a safe switch will be met. Additionally, as another important step in preparation for the switch, countries must implement a containment plan for polioviruses, according to the guidelines that have been adapted for the Region.

To verify that requirements for the adequate containment of poliovirus and final destruction of the tOPV following the switch have been met, the countries of the Region should form National Certification Committees composed of independent experts in different areas of public health. PAHO has formed a new Regional Certification Committee (RCC), which met for the first time in June 2015.

Regional plan for poliovirus containment

The Americas Region (AMR) completed Phase I of containment of wild poliovirus infectious or potentially infectious materials in 2010. Phase I was conducted in 42 countries and territories, following WHO guidelines, under AMR RCC guidance, and with the support of PAHO as secretariat.

Of 59,898 laboratories/institutions surveyed, 4,673 (7.8%) were classified as high risk, 11,549 (19.3%) as medium risk, and 43,676 (72.9%) as low risk of a facility-associated reintroduction of poliovirus into the polio-free community. At the end, 12 countries reported to have infectious or potentially infectious material of wild poliovirus, 3 of them (Colombia, Cuba and Panama) destroyed their material and 9 countries (Argentina, Brazil, Canada, Chile, Costa Rica, United States, Guatemala, Mexico and Trinidad) notified the decision to retain these materials, expecting final WHO recommendations.

On 29 December 2014, the WHO global action plan to minimize poliovirus facility-associated risk after type-specific eradication of wild polioviruses and sequential cessation of OPV use was delivered. The 3rd edition of the Global Action Plan (GAPIII) aligns the safe handling and containment of poliovirus infectious and potentially infectious materials with the PEESP.

Achieving this goal requires implementation of safe handling and containment of polioviruses to minimize the risks of a facility-associated reintroduction of virus into the polio-free community.

The global strategy to minimize poliovirus facility-associated risks consists of risk elimination by destruction of poliovirus materials in all but certified essential poliovirus facilities and bio-risk management of such facilities by strict adherence to required safeguards.

Risk elimination in non-essential facilities is achieved through the destruction, or a transfer to essential poliovirus facilities, of infectious and potentially infectious WPV and OPV/Sabin virus-containing materials. Destruction applies to all materials potentially contaminated with any type or strain of WPV or OPV/Sabin poliovirus, or where the presence of polioviruses cannot be ruled out.

In April 2015, a small working group meeting was convened in Washington, DC to review and discuss the adaptation of the containment plan for the Americas. Two issues were extensively considered: 24 years without AFP cases caused by wild poliovirus and OPV use in most of the countries.

Aligned with the Global Action Plan, the Regional GAPIII is being implemented in three phases linked to national and international milestones in polio eradication.

Phase I: Regional and global readiness coordination

Phase I is ongoing until conditions for the global readiness of OPV2 withdrawal have been met.

Key activities to be done during this phase are:

- National laboratory survey, and inventory of polioviruses (wild, vaccine) and potentially infectious material;
- Destruction of unneeded wild poliovirus materials, that includes VDPV;
- Transfer of needed wild poliovirus materials to essential poliovirus facilities;
- Destruction of unneeded vaccine poliovirus type 2 materials;
- Transfer of needed vaccine poliovirus type 2 materials to essential poliovirus facilities;
- Destruction of unneeded samples potentially containing poliovirus materials;
- Transfer of needed samples potentially containing poliovirus materials to essential poliovirus facilities;
- Governments, institutions, and polio facilities are informed about the upcoming need for poliovirus containment; and
- Designated essential poliovirus facilities obtain certification for containment.

Phase II: Poliovirus type 2 containment period

Phase II commences as soon as the criteria for global readiness of OPV2 withdrawal are met, and continues until certification of global WPV eradication. The trigger for setting a definite date for global OPV2 withdrawal (tOPV-bOPV switch) will be the absence of all persistent cVDPV2 for at least six months.

This phase has two parts, addressing the containment of WPV or OPV2/Sabin2:

Phase IIa: Containment of all wild poliovirus (WPV)

- All WPV are contained in certified essential facilities.
- All samples potentially containing wild poliovirus materials are contained in certified essential facilities.

Phase IIb: Containment of OPV/Sabin type 2 (OPV2/Sabin2) polioviruses

- All OPV2/Sabin2 polioviruses are contained in certified essential poliovirus facilities.
- All samples potentially containing vaccine type 2 poliovirus materials are contained in certified essential facilities.
- Safe handling of new samples potentially containing poliovirus material in non-essential laboratories.

Phase IIb commences within three months of OPV2 withdrawal (tOPV-bOPV switch).

Phase III: Long-term poliovirus containment

Phase III commences when global WPV transmission has not been detected for three years and just prior to certification of global WPV eradication.

Phase IIIa: Containment of all wild polioviruses

- All WPV are contained long-term in certified essential poliovirus facilities, with enhanced primary safeguards.
- All samples potentially containing wild poliovirus materials are contained in certified essential facilities, with enhanced primary safeguards.

Phase IIIb: Containment of all OPV/Sabin (OPV/Sabin) polioviruses

- All OPV/Sabin polioviruses are contained long-term in certified essential poliovirus facilities.
- All samples potentially containing vaccine poliovirus materials are contained long-term in certified essential facilities.

Phase IIIb commences within three months of bOPV cessation (bOPV cessation is planned one year after certification of global WPV eradication).

Findings from studies on IPV-OPV sequential schedules in the Americas

Based on the WHO recommendation that all countries in the world introduce at least one dose of IPV in their routine immunization schedules by the end of 2015, in preparation for the switch from tOPV to bOPV, studies were conducted in Latin America to assess the immunological response to sequential vaccination schedules of IPV followed by bOPV. The main results of these studies indicate that:

1. One dose of IPV at 2 months of age or later provides seroconversion in 80% of children vaccinated with an additional 10% of children presenting immunological memory in case of exposure to wild or vaccine virus.
2. Two doses of IPV provide seroconversion in 100% of vaccinated children.
3. As for intestinal immunity, two doses of IPV decreased the peak and duration of poliovirus excretion, in response to the monovalent type 2 oral polio vaccine challenge.
4. bOPV is equivalent to tOPV in seroconversion to serotypes 1 and 3 with protection in >95% of children after 2 doses. The bOPV proved to be safe, with no evidence of serious or moderate adverse events supposedly attributable to the vaccine.

Recommendations:

- All countries should have a comprehensive national switch plan developed by July 2015 and should introduce at least a single dose of IPV by the end of 2015 in order to ensure a safe switch from tOPV to bOPV.
- Countries should achieve and maintain high vaccination coverage with IPV >95% in every district and municipality. They should strengthen AFP surveillance for the early detection of polio cases caused by cVDPV or WPV. The risk of polio outbreaks caused by cVDPV2 after discontinuing use of tOPV will remain for a limited time during the transition period. After the switch from tOPV to bOPV, countries should apply at least one dose of IPV followed by two doses of bOPV, to ensure full immunity.
- Countries that have not already formed a National Certification Committee should do so as soon as possible in order to fulfill the requirements and demands of the Global and Regional Certification Commissions.
- Countries should be prepared to follow TAG recommendations on the introduction of a second IPV dose as soon as the available IPV supply is sufficient.
- TAG reaffirms that the containment of poliovirus is needed in order to protect the achievement of poliovirus eradication. TAG endorses the Regional Action Plan for containment of poliovirus that is aligned with GAP-III.
- TAG invites all countries to designate a national polio containment coordinator (NPCC).
- TAG encourages countries to carefully document the national poliovirus inventory according to the recommendations outlined in the containment plan.
- TAG reaffirms that countries must define the poliovirus essential facilities that will satisfy the GAP-III requirements to be classified as certified essential facilities.

Monitoring Immunization Progress in the Americas with the PAHO/WHO-UNICEF Joint Reporting Form (JRF)

Background

PAHO/WHO and UNICEF jointly collect information on the structure, policies, performance and impact of national immunization programs every year. Since the 1980's, PAHO has collected immunization data using the EPI Tables, initially several times a year and then every six months. Historically, WHO and UNICEF have also collected immunization data. These organizations completed this data collection on separate timelines, despite the fact that each organization requested similar information from countries. Beginning in 1998, WHO and UNICEF merged their data collection and processing exercises through a Joint Reporting Form on Immunization (JRF) and in 2005, PAHO adapted the EPI tables to merge them with those of the WHO/UNICEF JRF. The structure and content of the JRF is now defined jointly by WHO headquarters and its regional offices (including PAHO), as well as by UNICEF, and is reviewed every 2 years; the last JRF review took place in September 2014.

The JRF is a tool used for a comprehensive data collection process. Ultimately, the objective of this process is to obtain accurate, up-to-date data on the progress of immunization programs from all WHO/UNICEF Member States globally and disseminate information to all immunization stakeholders. The data reported through the JRF is the official information source from countries and is available on the web at www.paho.org/immunization/data. It is also disseminated in at least three of PAHO's printed publications: the Immunization Newsletter, the annual brochure "Immunization in the Americas" and in immunization country profiles. Similarly, WHO and UNICEF use JRF data to produce six annual publications, articles and reports with worldwide distribution.

The process of completing the JRF also aids countries in standardizing, organizing and producing useful data for the management of their own immunization programs, as well as in evaluating the progress made. At the regional level, the data collected through the JRF helps PAHO identify the strengths and challenges faced by its Member States. This data also contributes to the formulation of regional immunization strategies, including prioritizing areas of technical cooperation with countries.

At the 2012 World Health Assembly, all WHO Member States endorsed the Global Vaccine Action Plan (GVAP) and its monitoring and accountability framework. During the 2015 Directing Council, PAHO Member States will be asked to consider the adoption of the Regional Immunization Action Plan (RIAP), which is the adaptation of the GVAP for the context of the Americas. The RIAP will provide a regional roadmap for achieving immunization goals at both the regional and global (GVAP) level. The JRF will be the official data source for monitoring the implementation of the RIAP and the progress towards achieving the targets set forth at both the regional and global level.

While the JRF offers a standardized structure and process for reporting against key indicators, this data is only useful in as far as the country-level reporting is complete, adhering to high-quality standards and submitted in accordance with the regional and global level deadlines. Late submissions and incomplete reporting result in significant data gaps and misinformation, which may impede informed policymaking and development of regional and global strategies. In the Americas, only 20 countries and territories submitted their 2015 JRFs by April, the official cutoff for submissions. An additional 20 countries and territories completed the submission process for JRFs during the months of May and June (as of 25

June); however, two countries still have not submitted their reports for this period. These delays affect the regional and global deadlines for reporting. Beginning in 2015, PAHO has made efforts to produce automated country reports from the JRF data to provide a feedback loop to countries as a means of validation.

Other challenges related to reporting inconsistencies and missing data can also have repercussions, including more delays in the publication of official data at the regional and global level, incorrect conclusions from the data and, in general, the dissemination of misinformation. In the worst case scenario, analysis of some indicators becomes impossible due to poor quality and/or missing data points. Examples that illustrate some of these challenges in terms of JRF data are presented in the following sections, related specifically to vaccination financing data and overall vaccination coverage.

Monitoring sustainable financing for immunization in the Americas

For nearly two decades, PAHO Member States have routinely reported their expenditures on vaccines and vaccination supplies. More recently, countries have reported on the operational budget and execution for immunization services, including recurrent costs such as salaries, maintenance of vehicles and cold chains, social mobilization activities, to name a few. Historically, Member States have matched expenditures against the same planning categories used for the annual plans of action and draw from official budget execution reports. Since 2006, the WHO-UNICEF JRF has included six immunization expenditure indicators.

Four indicators are expressed in absolute values (US$ or local currency):

- Total expenditure on routine immunization, including vaccines
- Government expenditure on routine immunization, including vaccines
- Total expenditure on vaccines - used for routine immunization
- Government expenditure on vaccines only - used for routine immunization

Two indicators expressed in percentages (%):

- Percentage of routine immunization expenditure financed by government
- Percentage of vaccine only expenditure used for routine immunization - financed by government

The overall objective of these indicators is to indicate the extent to which countries are moving towards financial sustainability and greater country ownership, while introducing new vaccines and increasing universal access to immunizations. While countries in the Region and elsewhere have consistently reported against these six indicators, analysis reveals that the operational definition of the indicators and understanding of their use has changed over the years, resulting in challenges both for the countries reporting and the regional and global levels using the data to monitor trends. The WHO and PAHO are committed to supporting countries in their understanding, estimation, and use of immunization expenditure data, in order to track progress towards sustainable financing. PAHO has developed guidance for categorizing expenditures in the annual plans of action, which should ideally facilitate how expenditures are reported. Also, some countries have received support from PAHO to estimate the cost of immunization services, including the health systems shared costs – though, these expenditures should not be included in the official JRF expenditure indicators.

The GVAP has given high priority to country ownership and financial sustainability of immunization programs. In its accountability and monitoring framework, “domestic expenditures for immunization per

person targeted" is one of the key indicators to monitor progress toward government commitment to NIPs. These indicators are becoming more strategic and increasingly used to evaluate and to inform immunization policy at the global, regional and country levels. Interest in improving the quality and completeness of fiscal data has increased since 2000 as governments in the Americas and elsewhere have substantially increased their investment in expanding immunization services, both in terms of the populations targeted and the vaccines offered. For example, the proportion of total available financing from government sources has on average reached 90% or more, and in most years surpassed 99% during the period between 2009 and 2013. The increase in total financing with origin from domestic (do we mean national government?) revenue sources indicates a strong push in the Region towards sustainability for the program. Despite the absolute large incremental hike in resource needs, governments have consistently been able to source their programs with national funds.

However, the current quality, timeliness and accuracy of immunization and vaccine expenditure data for the full range of countries in the Region are weak and vary considerably among countries and reporting year. Errors, inconsistencies, and missing data are frequently identified when compiling and analyzing the data in time series. There are a number of issues that have contributed to reporting problems, including the limited clarity and understanding of the indicators and instructions; difficulty in accessing actual expenditure data; and lack of capacity, skills and incentives to collect, estimate, validate, and report the correct data. These limitations are hindering efforts to assess progress towards sustainable financing objectives and to make financing and strategic decisions based on strong evidence at the global, regional and country levels.

Immunization coverage trends in the Americas

With the approval of the GVAP's M&E framework, the World Health Assembly established a series of four immunization coverage indicators on which progress should be reported annually. These indicators were adapted for the Region and incorporated into the RIAP. Based on preliminary JRF data received for 2014 (from 40 out of 42 countries and territories), regional results for these indicators are listed below:

1) Number of countries reporting national average coverage of at least 95% with DPT3 in children less than 1 year of age.
    - Preliminary reported regional DPT3 coverage for 2014 was 88%, compared with 90% in 2013. Looking at overall trends, reported regional DPT3 coverage has steadily decreased over the last four years. In 2014, 15 out of 40 countries and territories reported national DPT3 coverage greater than 95%; 20 countries and territories reported coverage between 80% and 94%; and three reported coverage between 50 and 79%.

2) Number of countries reporting coverage of at least 95% in each district or equivalent with DPT3 in children less than 1 year old.
    - When examining equity in coverage at the subnational level, 42% of all municipalities in the Region reported coverage of at least 95% for DPT3 in 2014; this was a decrease in comparison to 2013 (46% of all municipalities).

3) Number of countries and territories that have a dropout rate below 5% between the first and the third dose of DPT.
    - Across the Region, in 2014 the DPT dropout rate was below 5% in 22 countries and territories. Seven countries reported negative dropout rates, or having administered more third doses than first doses of DPT.

4) Number of countries and territories with coverage of at least 95% for DPT3 sustained for three or more consecutive years.
    - Twelve countries or territories reported coverage of at least 95% over the last 3 or more years (2012 – 2014); in contrast, over the last three years, 23 countries and territories have never reported national DPT3 coverage greater than 95%. Additionally, three countries reported a drop in DPT3 coverage greater than 5%, when comparing 2013 to 2014.

The combination of the decreasing trend in reported regional DPT3 coverage, with decreases in the percentage of municipalities reporting coverage over 95% is of great concern. Given that viruses such as measles, rubella, and polio continue to circulate in other regions of the world, stagnant or decreasing coverage in the Americas places the immunization achievements of the entire Region at risk and requires collective action in order to confront.

Recommendations:

- PAHO should work with countries to identify obstacles encountered in the proper completion of the JRF and to streamline the reporting and data collection processes.
- In turn, TAG calls on countries to improve the quality, completeness and timeliness of JRF reporting, as the JRF is the official tool for reporting against global and regional immunization program targets in the GVAP and RIAP.
- TAG encourages countries to routinely assess the financial sustainability of their programs, using the tools in the JRF and other tools from PAHO, such as COSTVAC and the expenditure tracking tool in the quarterly Plans of Action Reporting of Expenditures.
- PAHO should develop training materials and distribute specific guidance on the data sources and methods required for correctly collecting data used in the JRF, using new technologies where applicable.
- PAHO should further the dissemination of JRF data and systematize the production of immunization country profiles.

Update of the PAHO Revolving Fund in the Global Context

Improving Member States' understanding of the challenges of vaccine markets is important to maintain the focus of PAHO and Member States towards actions that can ensure access to sufficient quantities of vaccines on a timely basis and at lower prices. In addition, understanding the rationale of global efforts and initiatives related to vaccine access will help Member States comprehend the importance and recognize the value and uniqueness of the PAHO Revolving Fund.

Timely and sufficient availability

Vaccine markets are unique and unlike other pharmaceuticals. Vaccines are more prone to manufacturing failure, and thus require high quality manufacturing standards with resulting regulatory oversight and costs. Production timelines are often lengthy and require considerable and careful advance planning. The limited number of manufacturers restricts the global supply base of some vaccines, which also does not promote competition to reduce prices.

Despite challenges in the vaccine market, the PAHO Revolving Fund has successfully ensured the sufficient availability of the majority of vaccines procured in the last 2 years. However, there are still some significant challenges. For example, for some vaccines, there is a very limited global supply base with no more than 3 or 4 suppliers, with no new entrants in the market expected. Such is the case with the BCG, DPT and Yellow Fever vaccines. For others, such as vaccines containing acellular pertussis, the supply base is not robust and there have been production problems from the manufacturers.

To address these challenges, PAHO has taken different approaches, depending on the issue. PAHO has moved its bid solicitation process to earlier in the year, so that manufacturers can be notified and plan production months in advance to the first deliveries. PAHO has been working with Member States to encourage them to consider different supply base conditions in their decisions on whether to include particular vaccines in their immunization programs. In addition, for vaccines such as BCG and DPT, based on market insight, the Revolving Fund implemented a different procurement approach and issued a three-year tender in order to increase market attractiveness for manufacturers and ensure long term commitment to fulfill the needs of PAHO's Region. With a vision to enhance the regional supply base of strategic vaccines, the PAHO Revolving Fund has expanded eligibility for some vaccines with marketing authorization and lots released by some regional National Regulatory Agencies. PAHO will continue encouraging developing country vaccine manufacturers in order to enhance supply of WHO pre-qualified vaccines that meet PAHO Revolving Fund quality standards for the Region.

Careful preparation and anticipation of demand forecasts from countries and territories is necessary to support PAHO's procurement strategy. PAHO has made missions to Member States to jointly review demand forecast processes and to identify improvement opportunities for the tools used.

Vaccine prices

Vaccine prices represent significant financial challenges for Member States, as the total vaccine cost to fully immunize a child against 12 vaccine-preventable diseases is US$63.80[2]. Most of this cost represents new vaccines – particularly pneumococcal conjugate (PCV) and rotavirus vaccines. The PCV vaccine alone is US$47.40, which accounts for 75% of the total vaccine cost of immunizing a child; and the rotavirus vaccine is US$13.00, which represents 20%. The introduction of the HPV vaccine adds an additional financial challenge.

Unfortunately, there is little to no real competition in the new vaccine markets for PCV, rotavirus, or HPV vaccines. There are no more than two WHO prequalified manufacturers for any of these products, and no new entrants expected in the short term; and market competition is a key driver to lower prices. For example, the pentavalent (DTP-HepB-Hib) vaccine is available at significantly lower prices than it was six years ago as a result of an increased number of WHO prequalified manufacturers, currently seven. This competition has led to a sharp drop in prices.

The PAHO Secretariat continuously seeks opportunities to access vaccines at lower prices in order to support the sustainability of Member State immunization programs, and its opportunity to keep expanding the protection against other preventable diseases for the populations.

Counting on the commitment of solidarity and support from PAHO Member States during a long negotiation process, the PAHO Secretariat, with support of partners, reached agreements with both HPV vaccine manufacturers to secure lower prices for the participating countries and territories in the Revolving Fund. PAHO is encouraged that, as a result of these agreements, the use of this vaccine should be brought to scale in the Region. Dialogue, partnership, and commitment of solidarity from PAHO Member States have made this success possible.

Global initiatives in regards to vaccine access

Countries beyond our Region are exposed to the same challenges of the vaccine markets as the countries in our Region. The difference is that countries in our Region have access to the Revolving Fund and have solved different financial, procurement and regulatory challenges, which the countries in other regions still face. Pooled vaccine procurement initiatives in other regions have been considered or implemented but without achieving the expected results so far.

In May 2015, the World Health Assembly (WHA) agreed to a resolution that urges Member States to increase transparency around vaccine pricing, explore pooling the procurement of vaccines, among other aspects. This endorsement will support the ongoing and future global efforts to increase access to affordable vaccines for middle income countries.

Currently there are two global efforts led by the WHO including PAHO, with the support of partners. These efforts are "The Vaccine Product, Price and Procurement (V3P) system[3]" to increase vaccine price transparency. So far PAHO RF, UNICEF and 34 countries, most from the European region, are sharing

[2] Based on 2014 PAHO Revolving Fund Prices and considering the following vaccines: BCG, polio, penta (DPT-Hib-HepB), MMR, PCV, and Rotavirus.
[3] http://www.who.int/immunization/programmes_systems/procurement/v3p/platform/en/

vaccine prices. Despite the limited number of countries participating, the impact of the PAHO Revolving Fund with regards to access to lower prices can be seen in the V3P.

The second effort, endorsed by SAGE in April 2015, is known as the Middle Income Countries (MIC) Strategy. The Strategy focuses on enhancing political will and appropriate domestic financing; strengthening evidence-based decision-making; access to timely and affordable supply; and, enhancing systems and delivery capacity. Within the framework of the MIC Strategy, PAHO will explore opportunities to synergize procurement approaches with developing countries in other WHO Regions.

At the end of 2014, 41 countries and territories had acquired vaccines, syringes, and supplies through the Revolving Fund. The Fund offers 45 vaccines and 19 types of vaccination supplies. Total purchases over the past year have been in the order of US$573.3 million. Given the global vaccine market dynamics, global efforts mentioned, and the relevance of the pooled vaccine procurement approach in the Americas, the Revolving Fund has emerged as an example of a successful mechanism for several international organizations and other WHO regions.

Recommendations:

- TAG recognizes the PAHO Revolving Fund as a unique contribution to the success of the immunization programs in the Americas, and that it represents a model for consideration by other Regions.
- TAG lauds the collective effort of countries participating in the Revolving Fund to ensure access to an affordable and sustainable supply of vaccines for the people of the Americas.
- TAG encourages PAHO to update countries on vaccine markets and implement proactive responses to specific vaccine issues.
- Successful negotiation of affordable prices requires, among other aspects, that all countries provide accurate forecasting of vaccine needs. Therefore, TAG strongly recommends that countries ensure the development of increasingly accurate demand forecasts and the prompt payment against the orders. PAHO should support countries in the process of demand planning and monitoring.
- TAG encourages PAHO to support global efforts to improve access to affordable vaccines, including regional pooled procurement initiatives.

Update on Maternal Immunization

Maternal immunization refers to immunization prior to pregnancy, during pregnancy, and in the post-partum period (for both the mother and the newborn), in order to provide protection to the mother-child binomial. Maternal immunization has the potential to impact early childhood morbidity, and in some cases, mortality. Infections such as respiratory syncytial virus (RSV), influenza, and pertussis are associated with adverse outcomes in young infants – i.e. prior to commencement or completion of primary infant immunization series. Gains in reducing global childhood mortality have mostly been outside the neonatal period. Approximately 40% of global childhood deaths occur in the neonatal period. Many of these deaths are due to infections that can be prevented through existing or potential maternal vaccines.

One reason maternal immunization has gained attention in recent years is the potential to leverage the antenatal care platform. It is a core component of the new immunization model, which transitioned from child immunization to immunization of the whole family. The establishment of a routine maternal immunization platform represents a new paradigm that includes the universal use of influenza, tetanus and pertussis vaccines and consideration of the use of other relevant vaccines in the near future.

To date, in all LAC countries, the tetanus-diphtheria-containing vaccine is recommended for all women of childbearing age; in 27 LAC countries influenza immunization is indicated for pregnant women; and, the pertussis-containing vaccine is indicated for pregnant women in 11 LAC countries in outbreak situations

PAHO Maternal Immunization Working Group (PAHO MIG)
In February of 2015, PAHO convened a PAHO Maternal Immunization Working Group (PAHO MIG) in Washington, DC with key maternal immunization and infectious disease experts from multiple institutions, with the aim of developing a PAHO field guide on Maternal Immunization and to provide ongoing technical guidance on maternal immunization to the PAHO Technical Advisory Group (TAG).

The PAHO MIG includes representatives from WHO, CDC, Emory University, CLAP, FLASOG, the Expanded Program on Immunization (EPI) – Honduras, EPI – Argentina, Cincinnati Children's Hospital and the Universidade Santa Casa de Sao Pablo.

The PAHO MIG is currently reviewing the content to be included in the guide, which will provide information on the integration of immunization and prenatal care services, vaccine safety and effectiveness, decisions on implementation or expansion of coverage of existing available vaccines (such as seasonal influenza, tetanus and pertussis), M&E, and communication strategies and tools for different target audiences.

Vaccine safety
Maternal immunization is critical for the health of both mothers and babies. The demonstrated safety of maternal vaccines, as well as the management and communication of adverse events constitutes a critical strategy for the success of the maternal immunization platform in the PAHO Region. The PAHO Maternal Immunization Guide will address this important issue and provide countries with practical

communication tools and guidance for different audiences (obstetricians, pregnant women, general population, and media).

Integration of immunization and antenatal care services

A key aspect highlighted throughout the guide is the integration of health services. An integrated and comprehensive service delivery has the potential to generate demand, strengthen routine immunization services, and improve the coverage of integrated activities. NIP's and other reproductive, maternal, neonatal and child health (RMNCH) interventions will benefit integration at the service delivery level, since it make the most efficient use of scarce resources, such as health workers, and respects the burden on families associated with travelling to health facilities. It also implies that more mothers and children will receive these integrated health services.

As part of these integration efforts, PAHO's Immunization Unit is working closely with the Latin American Center of Perinatology (CLAP) to expand their Clinical Perinatal Record to include more maternal immunization-related variables that will allow for regional analysis, progress follow-up, and eventual adverse events.

Maternal immunization schedule

The PAHO field guide contains a revision of maternal immunization, covering all SAGE and TAG-recommended vaccines (preconception, during pregnancy and postpartum), and the vaccines that could be given to pregnant women in special situations, including travel to endemic areas of diseases preventable by maternal immunization, exposure, and outbreaks. It also includes newborn immunization during the first 24 hours of life (BCG and hepatitis B).

Recommendations:

- TAG congratulates PAHO for taking the lead in the development of an integrated maternal immunization platform, including guidelines and a maternal immunization schedule.
- TAG encourages PAHO to finalize this line of work to provide guidance to countries on maternal immunization, including information on vaccine safety and risk communication necessary to its successful implementation. PAHO should foster a model where immunization is part of an integrated platform of care for pregnant women and newborns.
- TAG reaffirms existing recommendations for the universal use of influenza vaccine among pregnant women and the use of Tdap among pregnant women where indicated by pertussis outbreak among young infants.

Update on the Status of Measles, Rubella, and Congenital Rubella Syndrome Elimination

On the 22nd and 23rd of April, 2015, the International Expert Committee (IEC) for Measles and Rubella Elimination in the Americas reviewed epidemiological evidence presented by PAHO/WHO Member States and determined that the Region had eliminated the endemic transmission of rubella and Congenital Rubella Syndrome (CRS). The last confirmed endemic rubella case was reported in February of 2009 in Argentina, while the date of birth of the last confirmed CRS case was August 26, 2009 in Brazil.

To accomplish this goal, PAHO developed a rubella and CRS elimination strategy, aligned with the measles elimination strategies. This strategy calls for the (1) introduction of a rubella-containing vaccine into routine vaccination programs for children aged 12 months, reaching ≥95% coverage in all municipalities; (2) implementation of a one-time mass vaccination campaign among adolescents and adults, in an estimated range of 15-49 years of age ("acceleration campaigns) and periodic follow-up campaigns among children aged 5 years; and (3) the integration of rubella surveillance with measles surveillance and the implementation of CRS surveillance.

Since 2010, 57 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 the United States (29). Regarding CRS, 4 imported cases have been reported in Canada (1 in 2011) and United States (3 in 2012). In 2015, no imported cases of rubella or CRS have been reported.

The IEC also noted that, in the near future, it hopes to be able to declare the Region free of measles. Endemic measles transmission had been interrupted in the Region in November 2002. Nevertheless, in recent years, imported cases from other regions of the world have produced significant measles outbreaks in several countries. The total count across the Americas of imported cases from 2003 to 2014 reached 5,086 cases, most of which occurred in 2011 (n=1,369) and 2014 (n=1,824). In 2015, a total of 543 cases have been reported[4] mainly in Brazil (n=161), Canada (n=195), Chile (n=7), Mexico (n=1), Peru (n=4) and the United States (n=175).

During the April meeting with the IEC, Brazil presented the current epidemiological situation of the sustained measles outbreak affecting the states of Ceara and Pernambuco. After updating the figures through the weekly measles bulletins, the number of confirmed cases reached 1,109[5] for the period 2013-2015. The outbreak remains active in the state of Ceara (n=855), specifically in the municipalities of Fortaleza (n=395) and Caucaia (n=87). Adolescents and adults remain the most affected group by this outbreak (44.4%), followed by children aged 6-11 months (24.8%). For this reason, Brazil started vaccinating children aged >6 months in 2014 (dose zero) and continued administering the first and second doses at 12 months and 15 months. The genotype identified was D8. Slow but continuous transmission ("drop by drop" transmission) showcased failure to implement an aggressive and quick outbreak response, as well as the presence of several unvaccinated individuals dispersed in areas with reported high vaccinated coverage.

[4] Data as of epidemiological week 26, 2015 (ending on 4 July 2015).
[5] Data as of epidemiological week 25, 2015 (ending on 27 June 2015).

In late February 2015, Ceara implemented a mop-up vaccination campaign targeting individuals aged 5-29 years in Fortaleza and Caucaia. The campaign may be extended to additional municipalities (n=20) in order to get ahead of the virus. Strong political commitment is being demonstrated at all levels (federal/state/municipality) to halt the current epidemic within the next 60 days, as strongly recommended by the IEC in April 2015. However, despite improvements, the outbreak continues, with rash onset of the last confirmed case on 2 June 2015.

Today, endemic measles virus transmission has been re-established in Brazil, as virus circulation has persisted for over 24 months in the country, and there are still cases under investigation (n=35)[6].

Regional framework for sustaining elimination

Following the Resolution CSP28.R14 issued at the 28th Pan American Sanitary Conference in September 2012, the IEC tasked PAHO at its last meeting to provide guidance on how to monitor the progress towards the sustainability of measles, rubella and CRS elimination. To this end, PAHO is developing a framework to monitor the sustainability, to ensure alignment between the activities that will be implemented among PAHO's Member States. This framework will build on the vast experience gained in all countries and therefore will propose complementary surveillance and vaccination activities (i.e. active case finding) to add to existing evidence in the documentation of the absence of measles and rubella cases in the Region. The sustainability of measles and rubella elimination should be annually monitored in each country, following a standardized process.

Several technical consultations were held for defining the surveillance indicators, including a working group meeting with renowned country experts and PAHO's immunization focal points, which took place in Bogota, Colombia on June 2-3, 2015. The working group underscored the need of having complete, reliable, timely and consistent surveillance data. To this end, it was proposed to replace the indicator that collects information on the number of surveillance sites reporting weekly with, indicators to monitor the number of municipalities reporting suspected measles and rubella cases as well as the number of countries reporting measles-rubella weekly data to PAHO. Finally, the working group recommended that countries adopt and use PAHO's confirmed case definition for measles and rubella, and the CRS suspected case definition.

Following recommendations from TAG in 2014 requesting that PAHO carefully study the transmission patterns and age-distribution of cases in the recent measles outbreaks, PAHO presented this data, in particular evidence from recent outbreaks in Brazil, Ecuador and the United States, to the June 2015 technical consultation working group members. Based on this evidence, the working group agreed to continue recommending vaccination against measles (one or two doses depending on the age) for all individuals over 6 months of age living in areas with documented measles virus circulation.

Recommendations:

- TAG recognizes the efforts of Brazil in the face of the ongoing outbreak of measles. Nonetheless, TAG urgently calls on the Government to take decisive measures to end the outbreak of measles in Ceara. Following the last confirmed measles case in Ceara, the government will need to document the interruption of measles virus circulation in the affected areas, in accordance with the verification criteria established by PAHO.

[6] Data as of epidemiological week 24, 2015 (ending on 20 June 2015).

- TAG urges countries to fully implement the currently recommended surveillance indicators, in order to have a sensitive and timely surveillance system, which produces reliable and consistent data.
- TAG recommends vaccinating infants 6-11 months of age in outbreak situations. (This dose will be considered to be a “zero dose”). These infants should then receive the first dose of measles-rubella-mumps (MMR) containing vaccine when they reach 1 year of age, and a second dose according to the country’s national schedule, preferably at 18 months of age.
- TAG strongly recommends that WHO-Geneva raise progress towards the global elimination of measles as a resolution at the next World Health Assembly (WHA), to strengthen the commitment of the other regions in achieving the goals of the Global Vaccine Action Plan (GVAP).

Update on HPV Vaccination in the Americas

As of June 2015, 23 countries and territories in the Americas have introduced the vaccine against human papillomavirus (HPV) in their publicly funded immunization programs. An estimated 85% of a typical birth cohort of adolescent girls (6.5 million girls) has access, by policy, to HPV immunization in the Americas. Data on the actual vaccination coverage is not available for all countries that have introduced the HPV vaccine. Where available, these data show that coverage is at best 85% for the first dose and lower for the subsequent doses.

The pace of countries introducing the HPV vaccine appears to have decreased in the Americas. Although seven countries introduced the HPV vaccine in 2013, only three countries did so in 2014. Six additional countries had intended to introduce it in 2014, but, but did not. Compared to the subregions of North America, the Southern Cone and the Andes, fewer countries in Central America and the Caribbean have introduced the HPV vaccine. Concern about whether the country can afford HPV vaccination is the main reason why national authorities have postponed new introductions. Nonetheless, PAHO, with support of partners, reached agreements with both HPV vaccine manufacturers to secure lower prices for the participating countries and territories in the Revolving Fund. This agreement — together with the implementation of a 2-dose extended immunization schedule for adolescents aged <14 years (recommended by both TAG and SAGE) — should, in the next few semesters, ease concerns about the affordability of HPV vaccination. Economic analyses unequivocally show that HPV vaccination is a cost-effective intervention.

Evidence from active surveillance and large epidemiological studies demonstrate that the HPV vaccine is safe. Regrettably, large strata of the public, the media, and even health professionals have an opposite, incorrect perception. This situation came to a dramatic manifestation in August 2014 in a town of the Caribbean coast of Colombia, where an outbreak of mass psychogenic illness occurred. HPV vaccination was expanded in Colombia in 2013 to include all girls aged 9–18 years; in the affected town, a significant number of girls received their second dose in March–April 2014. Between May 28 (outbreak onset) and mid-September, 2014, 457 patients presented at the town's hospital with two or more of the following signs/symptoms: headache, paresthesia of the lower or upper limbs, respiratory distress, chest pain and fainting. Of those patients, 444 (97%) were girls aged 9–19 years. Although some girls went to the hospital several times, all case-patients recovered quickly without sequelae. The epidemic curve shows several clusters of cases over the 3.5-month period. The community initially attributed the illness to an alimentary intoxication and later to pesticide fogging. However, the largest cluster of cases occurred between August 18 and 28, 2014, when the community eventually attributed the illness to HPV vaccination and national media quickly covered the story. In the town, there are 21 schools; 60% of the cases related to 6 schools. Highest attack rates were observed for girls living in urban neighborhoods and attending public school. The outbreak may have started in a school, due to a psychologist who had labor complaints; an aspiring local politician, a group of lawyers interested in collectively representing the patients against both the state and the vaccine manufacturer, and representatives of the Spanish association of the "HPV vaccine victims" converged in August to fuel the outbreak. A similar, albeit much more limited outbreak occurred on September 4, 2014, in a school in Brazil. After the administration of the second dose of HPV vaccine, 11 girls fell ill and were taken to emergency rooms; all recovered quickly and were discharged. The Colombian and Brazilian outbreaks of mass psychogenic highlight the importance for health professionals and authorities to be aware of the possibility of mass psychogenic illness related to HPV vaccination or the administration of any other vaccines. In addition to a quick

recognition of these events, the response needs to be deliberate and carefully balanced because both dismissing and overreacting will fuel the potential outbreak.

HPV vaccine is safe and efficacious. Mounting evidence also shows that HPV immunization programs are effective in reducing HPV infections and precancerous cervical lesions among young women. HPV immunization programs can curb the burden of cervical cancer and possibly other HPV-related cancers within a generation in the Americas. Availability of the vaccine through publicly-funded programs, unambiguous programmatic efforts to achieve and maintain high vaccination coverage, and acceptance of the HPV vaccine by the public and media will be key ingredients to achieving such potential.

Recommendations:

- TAG applauds the efforts of the PAHO Revolving Fund to negotiate lower HPV vaccine prices for Member States to accelerate regional uptake of this vaccine.
- TAG urges countries that have not introduced the HPV vaccine as part of their vaccine preventable disease and cervical cancer prevention platforms to accelerate their decision-making process and to take full advantage of two-dose extended immunization schedules and the favorable HPV vaccine price offered through the PAHO Revolving Fund.
- Countries that have already introduced an HPV vaccine should strengthen their efforts to determine vaccination coverage at the subnational and national levels, and to use these data to solve barriers to and misperceptions related to HPV vaccination.
- TAG requests that PAHO document the experiences and lessons of countries that have introduced the vaccine and make them available to other countries.
- TAG notes the findings from the Global Advisory Committee on Vaccine Safety (GAVCS) that affirm the safety of the HPV vaccine. PAHO should disseminate these findings and work with countries to develop easily understandable information on the safety and effectiveness of this vaccine in the prevention of cervical cancer.

New Vaccines Surveillance Update

Sentinel surveillance of bacterial pneumonia and meningitis (BP-BM), and rotavirus was implemented in Latin America and the Caribbean (LAC) in 2005. There are 12 countries (Bolivia, Brazil, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Nicaragua, Panama, Paraguay, Peru, Venezuela) and 37 sentinel sites for BP-BM, and there are 18 countries (same countries as BP-BM, but also Chile, Colombia, Dominican Republic, Guyana, Saint Vincent and Grenadines, Suriname) and 79 sentinel sites for rotavirus surveillance. Since 2009, the World Health Organization (WHO) has implemented the global sentinel surveillance network for invasive bacterial diseases and rotavirus and LAC is part of this network.

The objectives of the sentinel surveillance are to:

1. Describe the epidemiology of the diseases monitored.
2. Estimate the burden of disease to support the introduction of new vaccines.
3. Monitor the impact of vaccination on the epidemiology of these diseases.

Regarding the epidemiology of these diseases, the information gathered from surveillance has been important for the development of studies and data analysis that show how the distribution of the disease has changed after the introduction of vaccines, especially in the countries that had data before vaccine introduction.

The basic criteria for a sentinel site to be considered a consistently performing site include: the enrollment of cases for all 12 months of the year, the enrollment of at least 100 suspected cases per year for meningitis and rotavirus, and at least 500 for pneumonia.

The percentage of positivity for *Streptococcus pneumoniae (Spn)* in BP has shown a downward trend since the beginning of the surveillance in 2007. However, of the identified positive cases, the highest percentage still corresponds to *Spn*, representing over 70% of isolates from investigated cases in all of the years of surveillance. The surveillance of BP has enabled the reporting and investigation of 127,000 hospitalized pneumonias, 75,000 pneumonias with a radiological pattern that were most likely bacterial, and 56,000 blood samples which included 852 *Spn* or Hi positives for approximately one million hospitalized children.

In addition, the sentinel surveillance of BM has enabled to capture a total of 5,000 meningitis cases, of which 2,000 (49.2%) were classified as most likely to be bacterial and 285 were confirmed either as *Hib* (58; 20.4%), *Hi* not b (20; 7.0%), *Neisseria meningitidis* (39; 13.7%) or *Spn* (168; 58.9%).

However, the sentinel surveillance of BP-BM has a number of challenges that are important to consider. First, the identification of the total of hospitalized Community-Acquired Pneumonias (CAP); the accurate reading of chest X-rays, which classify the cases as probable for BP or not; obtaining blood samples or pleural fluid; and the culture and identification of these organisms.

Proper identification of hospitalized CAP, training in chest X-ray readings, the monitoring of sampling, culture, and identification procedures are key aspects in the proper functioning of this surveillance system.

Today, with regards to surveillance, the implementation and the use of molecular techniques, such as the Polymerase Chain Reaction (PCR), will be important for the proper identification of these pathogens.

Regarding rotavirus surveillance between 2005 and 2013, there have been a total of 256,643 hospitalizations for diarrhea reported and investigated, 136,040 suspected cases for rotavirus diarrhea, 104,068 stool samples collected, and 30,984 positive rotavirus cases. A downward trend in the percentage of identified cases of rotavirus diarrhea has been shown (percentage <0.001), with a reduction of 40% between these years. Some major challenges that have yet to be met with regards to rotavirus surveillance include the need to standardize sample selection for genotyping and linking case-based data to genotype data.

Recommendations:

- TAG recognizes that the success of sentinel surveillance depends upon the timely and complete reporting of data, and as such, countries should assure that the performance criteria defined by WHO/PAHO are met.
- TAG thanks countries for their participation in the Regional network and for the progress in monitoring the epidemiology of rotavirus and pneumococcal disease in the Region. Countries that have not implemented sentinel surveillance should consider doing so, using global and regional guidance on quality.

Missed Vaccination Opportunities

Strategic Objective 3 of the Global Vaccine Action Plan (GVAP) calls for the benefits of immunization to be distributed equitably to all people. PAHO, in its Regional Immunization Action Plan, shares this goal. PAHO and other partners have helped LAC countries implement plans of action to raise immunization coverage in vulnerable municipalities. Countries are encouraged to determine local causes of under-vaccination and to implement interventions to overcome barriers in achieving high vaccination coverage.

In response to recent country requests for assistance in conducting Missed Opportunities for Vaccination (MOV) studies with the goal of increasing immunization coverage in vulnerable municipalities, PAHO is publishing a standardized methodology to evaluate MOVs in children aged <5 years in primary and secondary health facilities and to evaluate the vaccine-related attitudes and knowledge of health workers. The methodology was adapted from the original WHO methodology published in 1988 and other immunization studies implemented in the Region, and takes into account the best practices in immunization surveys from LAC.

Based on a review of available data, PAHO developed the study methodology and two questionnaires: one to measure MOVs in children aged <5 years and one to evaluate the knowledge, practices, and attitudes of health workers. A guiding principle for the inclusion of information to be collected was its usefulness in the field and its potential for identifying corrective measures. The method was designed such that both questionnaires would be implemented on the same day at the same health facility, with the first being administered by interviewers to caregivers of children aged <5 years and the second being anonymously completed by individual health workers. The methodology seeks information from a broad range of participants and is designed to evaluate health practices in visits intended for vaccination and in those sought for other reasons (i.e. well child check-ups). Caregivers of children aged <5 years are eligible to participate following a visit to a health center for any reason. Healthcare professionals who do not routinely administer vaccines, including those who work in nutrition and well child clinics, may also be included in the health worker surveys.

The methodology allows for a cross-sectional evaluation of MOVs. Because the evaluation serves as an operational tool for the identification of MOVs in municipalities that do not meet target coverage levels, quota sampling rather than probability sampling is recommended. Geographical areas (municipalities) are first selected based on coverage rates, indices of unmet basic needs, and other indicators. Health facilities are then selected, taking into account the proportion of the population residing in rural versus urban areas and the proportion of patients who use hospitals versus primary care centers

In October 2012, the Dominican Republic piloted the updated methodology using the methodology and questionnaires written in Spanish. In 99 health centers in low-coverage municipalities, 1500 parents and guardians of a child aged <5 years were interviewed and 398 healthcare professionals completed the health worker survey. Of 782 opportunities for 527 eligible children to receive needed vaccines, a total of 262 MOVs were observed. To evaluate the completeness, implementation and understanding of the methodology, PAHO professionals participated in all stages of the evaluation. Implementation was considered successful: the assessment was feasible to implement in two weeks, target sample sizes were obtained, and a large proportion of health workers participated, recognized the findings as problems in their health facilities, and proposed solutions to these problems.

To implement the assessment, a country must adapt the questionnaires and MOV algorithm to its vaccination schedule. The methodology provides guidelines to aid investigators in determining eligibility, timely doses, and windows of opportunity. The country should then select an implementation team. Implementation teams should consist of a general coordinator, supervisors, interviewers, and data entry personnel (if data are collected using paper forms), and the inclusion of a statistician in the study team is recommended. The team may be composed of non-immunization health professionals, or the country may hire an independent polling company or an academic institution to conduct the assessment. Training sessions for team members, a pilot test, and procedures to ensure data quality are required. Before implementing the study, investigators must ensure that it will be conducted according to national regulations for the use of health data. Investigators are encouraged to conduct univariate and stratified analyses to identify factors associated with MOVs and under-vaccination in the surveyed population, with the understanding that the results are not generalizable to the entire country as sampling is non-probabilistic.

The final step is the preparation of reports that facilitate the design of specific strategies to reduce MOVs. The first report should be brief and highlight major findings for national health authorities and partners where applicable; and another more detailed report to be presented to the subnational and national EPI managers, and to those in charge at the local level.

As the results were presented in the Dominican Republic to both national and subnational EPI managers, and subnational officials, many of whom are responsible for immunization services in evaluated health centers, they suggested interventions and helped ascertain underlying factors related to identified barriers. Moreover, the inclusion of local-level immunization officials in the MOV assessment increases the involvement and commitment of the officials who are ultimately responsible for implementing interventions.

Lastly, countries should document studies they conduct on MOVs and under-vaccination. The limited number of published studies in developing countries, particularly in LAC, that evaluate immunization programs, validate coverage data, or assess the effectiveness of interventions is well known. Among other benefits, increased documentation of operational studies on immunization will help countries establish a baseline for progress, advocate for increased political commitment and external funding, promote evidence-based decision-making, and share experiences with the rest of the immunization community.

Recommendations:

- TAG commends the work of countries to identify and remove barriers, to vaccination with the aim of achieving high vaccination coverage at all levels.
- PAHO, in conjunction with other partners, will continue to review studies regarding the regional causes of under-vaccination.
- PAHO should make information available on the best practices to reduce missed opportunities for vaccination, describing how successful interventions are developed, cost-effectively implemented, monitored, and evaluated.
- Countries should document interventions and repeat this type of study, ideally with a costing component, in three to five years, to evaluate whether the interventions implemented were successful in reducing MOVs and contributed to more equitable immunization coverage rates.

Progress toward Regional Neonatal Tetanus Elimination

Background

In 1989, the World Health Assembly adopted a resolution calling for the elimination of neonatal tetanus (NNT) throughout the world by 1995 and the resolution was endorsed by the PAHO Directing Council. Ministers of Health of PAHO Member States initiated specific program activities to eliminate neonatal tetanus with support from PAHO and a variety of international agencies.

To achieve maternal and neonatal tetanus elimination (MNTE), the WHO recommends that countries reinforce the reliable surveillance of NNT cases, promotion of clean delivery services, routine immunization of pregnant women, and conduct supplemental immunization activities (SIAs) for women of childbearing age. The WHO defines global elimination as an annual rate of <1 case of NNT per 1000 live births at the district level.

Haiti is the only country in the Region of the Americas that has not yet achieved maternal neonatal tetanus elimination. In 2015, Haiti has estimated 11,447,951 inhabitants with 10 health departments and 140 health communes.

Progress toward Neonatal Tetanus Elimination in Haiti

Haiti has made substantial progress towards neonatal tetanus elimination and has implemented specific activities in order to achieve this goal by the end of 2015. In 2012, Haiti did a thorough data review of all communes and identified that all 140 communes were considered high-risk for NNT. In addition to vaccinating pregnant women during routine immunization activities, three rounds of Td-SIAs were conducted in the 140 communes to immunize all women of reproductive age, irrespective of their previous vaccination status in 2013, 2014 and 2015. These SIAs resulted in at least 80% of Td2+ vaccination coverage in 131 of the 140 communes.

Haiti also integrated NNT surveillance into AFP, measles/rubella, diphtheria and pertussis case-based surveillance in 2013. Thirteen cases of NNT were detected in 2013 with 3 communes reporting > 1 case per 1000 live births; in 2014 and to-date in 2015 only 3 and 4 cases, respectively, of NNT were detected, and every district is reporting < 1 case of NNT per 1000 live births.

Strong technical, logistical and financial support from partners (UNICEF, CDC, Brazilian Cooperation and PAHO) and high vaccination coverage during the Td-SIAs have been key factors in the progress towards NNT elimination.

However, despite the progress made, some challenges remain. There is a lack of human and financial resources to implement the necessary activities and percentage of clean deliveries, and Td routine immunization coverage is low. In 2014, the percentage of clean deliveries averaged 29%, ranging from 12% to 60% in the 10 health departments; and 54% of communes achieved less than 50% routine immunization coverage.

All maternal and neonatal tetanus elimination activities in Haiti depend on funding from partners. The main challenge is to mobilize funds in order to reach at least 80% of Td2+ vaccination coverage for pregnant women during routine immunization, integrate NNT community-based surveillance into NNT surveillance, and improve clean deliveries and practice proper umbilical care.

Recommendations:

- Elimination of NNT in Haiti is critical to achieving regional vaccine-preventable disease elimination targets. TAG urges the country to pursue the measures proposed towards NNT elimination, with support of the partners and special attention to the sustainability of these actions as an integrated approach. These proposed measures include:
    - Implement mop-up immunization activities for communes with <80% of Td2+ vaccine coverage during Supplemental Immunization Activities.
    - Review performance of maternal and neonatal tetanus elimination activities for each commune for specific actions.
    - Integrate neonatal tetanus community-based surveillance in order to reinforce NNT surveillance.
    - Set up survey of vaccine coverage for Td-SIA.
    - Invite the external assessment team in 2016 for validation of Maternal Neonatal Tetanus Elimination.

Dengue Vaccine Development Update

Over the last three decades, the burden of dengue has steadily increased in the Americas. In 2014, 1,178,506 cases of dengue were reported in 47 countries and territories in the Region. Of these, 16,044 cases (1.4%) were serious and 677 (0.06%) patients died. Reported cases are estimated to represent only one tenth of all clinically apparent dengue virus infections of the Region. In addition to the relevant human suffering that these figures represent, they are also a clear indication of the burden that dengue puts on national health care services and economies. Dengue virus transmission has occurred in all countries of the Americas, except for Canada, continental Chile and Uruguay.

A dengue vaccine is viewed as a valuable additional tool for integrated dengue prevention and control. Five candidate vaccines are currently in clinical development and they are all tetravalent, i.e. intended to protect against the four dengue viruses (DENV1–4). Table 1 summarizes the characteristics and development phase of these candidate vaccines.

Table 1: Dengue Candidate Vaccines in Clinical Development, July 2015

Sponsor (Candidate Vaccine Name)	Candidate Vaccine Principle	Clinical Development Phase	Number of Doses (Schedule in Months)
Sanofi Pasteur (CYD-TDV)	Live-attenuated viruses (chimeric yellow fever virus vaccine 17D strain expressing pre-membrane and envelope proteins of DENV1–4) [CYD-TDV]	III (in follow-up, Asia and Latin America)	3 (0,6,12)
Takeda (DENVax)	Live-attenuated viruses (chimeric attenuated DENV2)	II (Colombia, Puerto Rico, Singapore, Thailand); III (planned for 2015)	2 (0,3)
US NIAID/ Butantan (TV003)	Live-attenuated viruses (full-length DENV 1, 3, 4 plus mutagenesis-directed chimeric DENV2)	II (stepwise, Brazil; Thailand), III (planned for 2015, Brazil)	1 (N/A)
GSK/ Biomanguinhos/ Walter Reed Hospital (DPIV)	Inactivated purified whole viruses	I (two trials in USA and Puerto Rico, respectively)	2 (0,1)
Merck (DEN-80E)	Sub-unit envelope protein expressed in an insect cell system	I (Australia)	3 (0,1,2)

In 2014, the results of two phase III trials of a live attenuated chimeric tetravalent dengue vaccine (CYD-TDV) carried out in Asia and Latin America were published. These results are the first ever published efficacy data for any dengue vaccine. The two trials include 10,278 children and adolescents aged 2–14 years of five countries of Asia and 20,875 adolescents aged 9–16 years of five countries in Latin America. Outcomes are consistent between the two trials. The overall efficacy for dengue was 57% in Asia and

61% in Latin America; efficacies for severe dengue and dengue hospitalizations were higher. While the CYD-TDV candidate vaccine is immunogenic for all four dengue virus serotypes, efficacy varies by serotype (lowest for DENV2, intermediate for DENV1, and highest for DNEV3–4). Also, efficacy was lower for younger participants and for participants without measurable antibody titers before the first vaccine dose was administered. The trials in Asia and the Americas are ongoing with an overall follow-up of 6 years, which is important to validate the results of the first 25 months of the trials.

As the clinical development of dengue vaccines advances, the strengthening of dengue surveillance is critical. Between November 2013 and June 2015, PAHO jointly with eight countries and supported by the Sabin Vaccine Institute developed a generic surveillance protocol intended for implementation in all countries of the Region. This protocol achieves three significant advances in particular:

- First, it translates the inherently clinical case classifications of the 2009 WHO "Dengue Guidelines for Diagnosis, Treatment, Prevention and Control" (dengue and severe dengue) into operative definitions that can be used in an epidemiological surveillance system. The agreed upon definitions now focus on probable (clinically compatible cases with a laboratory result suggestive of a dengue infection) and confirmed cases; the generic protocol standardizes in details, like definitions.
- Second, sentinel surveillance comes to complement country-wide passive surveillance. As opposed to systems developed so far for other vaccine-preventable diseases, the sentinel surveillance would not be based on a single institution—typically a hospital of the second or third level. Specifically, it is proposed to set up a "sentinel area" within each country, a well-defined locality within which the spectrum of dengue manifestations is recorded in detail in a hospital and in the health centers that refer patients to that hospital. Within a sentinel area, data from epidemiological, entomological and environmental surveillance are also to be integrated to guide overall prevention and control measures.
- Third, seven performance indicators have been defined to monitor the performance of the epidemiological surveillance. These indicators will contribute to a harmonized implementation of dengue surveillance in Latin America and the Caribbean. The indicators are: timeliness of the periodic report from the lower administrative level; virus typing in areas with ongoing transmission; information quality for the reported cases (minimum set of case data complete); lethality; incidence; proportion of severe dengue; predominant dengue virus serotype; infested household and Breteau indexes. Each indicator is defined in a format that standardizes it based on 10 attributes.

The generic protocol for dengue surveillance is being adapted to the national conditions and is implemented without major constraints in the majority of the eight countries that contributed to its development, including large countries like Brazil and Mexico. This fact indicates that the implementation of the protocol is feasible and that it should be acceptable to all the countries of the Americas. In addition to contributing to dengue prevention and control, the implementation of the protocol will also provide evidence for the decision-making related to dengue vaccine introduction and for the impact evaluation of dengue vaccination activities**.**

Recommendations:

- TAG recommends that the countries swiftly implement an integrated approach to reduce dengue transmission, providing training on diagnosis and clinical case management, emphasizing vector control, and improving awareness so that people know how to protect themselves and their communities from mosquitoes as stated in the World Health Assembly Resolution (2015).

- While the burden of dengue in the Americas is significant, TAG notes there is insufficient evidence to make a recommendation on vaccine introduction at this time. TAG is committed to evaluating timely new evidence as it becomes available and countries should do the same over the coming months in their own national decision-making processes.
- In coordination with other initiatives, PAHO's ProVac Initiative should support national level decision-making regarding dengue prevention and control, through the use of economic evaluations grounded in local data.

Update on National Immunization Technical Advisory Groups (NITAGs)

In the early years of the Expanded Program on Immunization (EPI), the World Health Organization (WHO) recommended a set of inexpensive vaccines that provided direct protection against six diseases. Global and regional recommendations on the routine use of these traditional vaccines quickly led to their adoption at country-level. Today, vaccines available to prevent pneumococcal disease, rotavirus diarrhea and cervical cancer as well as other second generation and new vaccines in the pipeline have promised to save even more lives. However, many country-specific factors influence how these vaccines are valued relative to other competing priorities in the immunization program and broader health sector. Therefore, the World Health Organization (WHO) has recommended that countries establish National Immunization Technical Advisory Groups (NITAGs) to provide objective and scientific advisory guidance to ministries of health regarding their national immunization policy decisions. NITAGs have an important role in developing recommendations regarding national vaccination schedules, introduction of new vaccines and immunization strategies (i.e. boosters, school based vs., health facility based delivery, etc.).

WHO developed guidance for the establishment and the strengthening of NITAGs in 2008. This guidance was adapted to the Region and published in 2010 for countries the Americas. The XX TAG recommended that immunization programs in the Americas accelerate the strengthening of NITAGs in countries with functional committees, including the development and adoption of standard operating procedures and increased investment in evidence generation at country-level. The TAG also encouraged countries to rapidly establish NITAGs where they currently did not exist. Since 2010, a set of common indicators to track the progress of NITAG establishment and strengthening has been incorporated into the WHO-UNICEF Joint Reporting Form (JRF). A functional NITAG has been defined as one that meets all of the six following process indicators:

1. Legislative or administrative basis for the advisory group
2. Formal written terms of reference
3. At least five different areas of expertise represented among core members
4. At least one meeting per year
5. Circulation of the agenda and background documents at least one week prior to meetings
6. Mandatory disclosure of any conflict of interest

The Global Vaccine Action Plan (GVAP) and the proposed PAHO Regional Immunization Action Plan (RIAP) has set a goal of all countries having an active and functional NITAG by 2020. Member States of PAHO have made steady progress in establishing NITAGs and strengthening these advisory bodies to fully support a transparent and credible decision-making process for vaccine policy. By 2014, 23 countries in the Latin America and Caribbean Region had established NITAGs, which cover 93% of the regional population. Most recently, countries such as Guatemala and Peru have reestablished committees that were non-active for some years. However, only 17 of the 23 countries meet all six criteria for a well-functioning committee proposed by WHO/PAHO. Also, there are still a few large-population countries that have yet to establish committees.

PAHO has provided technical assistance in the form of trainings and facilitation of technical exchanges between committees since the 1990s. In the past five years, 12 countries have worked with PAHO to revise their terms of reference (TOR) and standard operating procedures (SOP). Argentina published

their revised TORs in *Vaccine* as a brief report last year in an effort to share with other countries. As of 2014, 22 of the 23 countries that report an active NITAG have formal terms of reference. Though, the systematic declaration of conflicts of interests by core members is still absent in some countries. Four of the 23 countries with NITAGs do not meet all six indicators for a well-functioning NITAG because these committees have not introduced these procedures. Still, the number of national-level decisions backed by NITAG recommendations in the Region indicates that governments generally recognize the value of NITAGs in ensuring a credible, transparent and evidence-based process for decision-making.

This process is only possible with the presence of a strong executive/NITAG secretariat within the national immunization programs. The executive/NITAG secretariat is responsible for the preparation of the technical content and evidence inputs required for the committees' deliberations. In this sense, since 2004, PAHO ProVac Initiative has assisted countries in the development of evidence inputs for vaccine policymaking, primarily vaccine cost-effectiveness and impact data. These studies have been an important input into decision-making for new vaccine introduction. 14 countries have completed analyses and presented results from them to their national authorities and in May of this year much of this data was published in a special issue of the journal *Vaccine*.

Important advances in strengthening the process for evidence-based immunization policy at the country-level in the Region have been made. To sustain this progress and achieve the goals set forth for this decade, countries will need to continue their commitment to strengthening their committees and establishing them where they do not yet exist. The English-speaking Caribbean is a special case where countries in this sub-region have generally worked as a sub-regional block towards harmonized policies for immunization. This model is unique in the world and the governments in this sub-region may consider strengthening the formality of this model.

Recommendations:

- TAG reiterates the independent advisory role of NITAGs and encourages all countries in the Americas to formally establish these committees, considering the guidance developed by PAHO.
- Where NITAGs already exist, they need to be guided by independent experts using the scientific evidence available to make recommendations with a transparent and structured process.
- In the English-speaking Caribbean, there are existing sub-regional collaborations on immunization policy development. PAHO should support countries in a coordinated effort to formalize this technical advisory structure.

Update on Cholera and the Oral Cholera Vaccine Stockpile

Reversing a gradual decrease observed from year to year, the number of cholera cases reported in Haiti during January—May 2015 was greater than the numbers for the same periods of 2014, and was similar to that of 2012 and 2013. Between January 1 and May 31, 2015, 17,107 cholera cases, 13,312 hospitalizations (78% hospitalization rate), and 139 deaths (0.8% case-fatality rate) were notified: these figures are, respectively, 3, 4 and 5 times greater than 2014. During the same period, the Haitian Ministry of Public Health and Population registered outbreak alerts in 8 of 10 country departments, an indication of an intense and widespread circulation of *Vibrio cholerae* O1 at the community level. The increase in cumulative incidence from 2014 to 2015 is observed for both the age group of children aged <5 years and that of people aged ≥5 years; however, the cumulative incidence in children is now twice higher than that of the older age group, whilst it was equal at the beginning of the epidemic.

During January–May 2015, 273 suspected cholera cases and 10 cholera-related deaths were reported in the Dominican Republic. Similarly to Haiti, the number of suspect cases represents a 76% increase compared to the same period of 2014, likely as a consequence of the cholera dynamics occurring in the neighboring country. In January 2015, the Canada International Health Regulations National Focal Point communicated the confirmation of cholera in an individual with history of travel to Cuba; no other cholera cases have otherwise been reported in 2015 related to Cuba. Fourteen cholera infections were registered in 2014 in Mexico (13 infections in the State of Hidalgo, and one in the State of Querétaro); no new cholera infection has been reported in Mexico since January 2015.

To address the possibility of cholera becoming endemic in the island of Hispaniola, attempts are being made to elucidate whether the causative agent of cholera has established an environmental reservoir in the surface waters of Haiti. Comparing the period from April 2013 to March 2014 to the previous 12-month period, researchers who use 15 sentinel sites in one Haitian Department found a four-fold increase in the number of water samples containing culturable *V. cholerae* O1 (9% vs. 2%); the number of sites with ≥1 positive sample rose to 58% from 20%. The authors suggested that seasonal water temperatures and precipitation likely drove those increases. The burden of diarrheal disease in Haiti is also being better documented, at least among children. In a prospective cohort of 1,245 school-children of a locality, gastrointestinal illness caused 278 visits per 1,000 children. The most common diarrheal pathogen was enteroaggregative *Escherichia coli* (17% of children with diarrhea), followed by *Vibrio cholerae* O1 and norovirus (both 7%).

TAG discussed the use of the oral cholera vaccine (OCV) in October 2012 with a focus on the island of Hispaniola. As part of a regional initiative towards the elimination of cholera transmission on the Island, TAG recommended deployment of the OCV in Haiti to mitigate the cholera burden in the short and medium term, until significant and sustainable advances are achieved in infrastructure for drinking water supply and sanitation. TAG's recommendations were adopted in the "National Plan for the Elimination of Cholera in Haiti, 2013–2020," which the Haitian Government issued in February 2013. TAG reviewed again the situation in July 2014 and reinforced previous recommendations to maintain WASH as a fundamental pillar to the comprehensive approach towards an overarching goal to eliminate cholera transmission. TAG also reaffirmed that vaccination is one of possible short-term actions toward the achievement of the long-term elimination goal.

In the past few years, reactive deployments of the oral cholera vaccine have been documented for both feasibility and effectiveness. The feasibility and administrative coverage of the first round of vaccination

in Haiti done by two non-governmental organizations in 2012 at a rural and urban site were reviewed at the previous TAG meeting. In 2013, the Haitian Ministry of Public Health and Population, with support from PAHO and UNICEF, implemented a second round of vaccination for 120,000 people of two towns. A survey of 925 households found that two-dose coverage was 63% and 77%, respectively. Coverage was 68% and 82% in children aged 1–4 years, 78% and 84% in children and adolescents aged 5–14 years, and 56% and 71% in persons aged ≥15 years. Dropout between first and second dose was smallest among younger children and somewhat higher in adults. Among adults, the coverage was higher among female participants than male participants. The main reason for not being vaccinated was the absence during the daytime hours, when the vaccine was offered. In August-September 2014, a third vaccination round occurred; 300,000 additional people were vaccinated.

The effectiveness of OCV deployments has now been assessed. Within 6 months of the reactive vaccination in two prefectures of Guinea (June–October 2012), a matched case-control study found 87% effectiveness (95% CI: 57–96%). Incomplete vaccination had 43% effectiveness (not significant, −84–82%). A similar study carried out between October 2012 and March 2014 evaluated the effectiveness of the cholera vaccine campaign that a non-governmental organization had carried out in April–June 2012 in the rural area of Haiti. Effectiveness was 58% (13–80%) based on certified vaccination and 63% (8–85%) based on self-reported vaccination. The results are compatible to those of a large cluster-randomized trial in an endemic area of Calcutta, India, which showed 65% effectiveness for five years after vaccination. Evaluations are ongoing to assess the effectiveness of a single dose (preferable especially in a reactive deployment) and its cost-effectiveness compared to two-dose series. As a counterpart to effectiveness, one needs to consider that the impact of vaccination eventually depends on the level of cholera incidence when vaccinated —impact will be higher when vaccinated at higher incidence, such as in the case of reactive vaccination.

The global OCV stockpile was launched in late 2013. It is managed as a rotating fund by the International Coordinating Group (ICG), of which WHO is a member and functions as Secretariat. Until June 2015, 17 requests from 10 countries (including one request from Haiti) were accepted and 1.8 million doses were deployed. In spite of the increased use, global OCV production has not kept pace with the demand, essentially because of lower than expected yields in the production of most used vaccine. Hence, OCV availability in the global market remains limited.

Recommendations:

- TAG reiterates its previous recommendations to maintain WASH as a fundamental pillar to the comprehensive approach toward the overarching goal of eliminating cholera transmission in the Island of the Hispaniola.
- Haiti should follow previous TAG recommendations that were included in the "National Plan for the Elimination of Cholera in Haiti, 2013–2020." As part of this implementation, Haiti may continue to require cholera vaccination.
- As information on the impact of cholera vaccination in Haiti remains limited, TAG recommends studying the effectiveness of future OCV deployments.

Impact of Rotavirus Vaccination in the Americas

The rotavirus disease is caused by rotavirus group A (RVA). It is an important public health problem, associated with severe diarrheas in children aged <5 years at the global level. It affects mostly children aged 3 to 36 months. The clinical spectrum is wide, going from asymptomatic infection to severe dehydration, choc and death. The disease is characterized by sudden diarrhea, vomit and fever. The disease is typically more severe than other diarrheas and is associated with dehydration and hospitalization.

An estimated 95% of children aged between 3 and 5 years will be affected by rotavirus. Incidence peaks during the fall and winter months in countries with temperate climates. According to WHO, rotavirus diarrhea leads to 453,000 deaths annually in children aged <5 years. In Latin American and Caribbean countries (LAC), before the introduction of the vaccine, there were 75,000 hospitalizations, one million medical visits and 10 million rotavirus diarrhea cases.

As of June 2015, 17 countries (Argentina, Brazil, Bolivia, Colombia, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Nicaragua, Mexico, Panama, Peru, Paraguay, and Venezuela) and one territory (Cayman Islands) in LAC have introduced the rotavirus vaccine, meaning that 92% of the birth cohort live in countries with vaccination schedules that include the rotavirus vaccine. There are two vaccines available: the monovalent human rotavirus vaccine G1[P8] (RV1 Rotarix®, GSK), and the pentavalent bovine-human, reassortant vaccine G1-G4[P8] (Rotateq®, Merck). The monovalent vaccine requires two doses (at 2 and 4 months) and the pentavalent three doses (at 2, 4 and 6 months). The PAHO's TAG recommends completing the schedule and vaccination by the first year of age; however countries should continue making efforts to administer rotavirus vaccines on their routine immunization schedules, at the recommended ages.

Regarding vaccine effectiveness, a meta-analysis (De Oliveira et al, 2015) found that RV1 varied, depending on the control group, between 63.5% and 72.2%. The effectiveness was higher in children <12 months ranging from 75.4% to 81.8%. In children aged >12 months it ranged from 56.5% to 66.4%. In Brazil, there was an estimated reduction of 130,000 hospitalizations and 1,500 deaths from diarrhea in a period of three years following vaccine introduction (Do Carmo et al). Other impact studies in El Salvador, Nicaragua and Panama showed a reduction of 48% (Yen et al, 2011), 23% (Orozco et al, 2009) and 37% (Molto et al, 2011) respectively in hospitalizations for diarrhea. There are many rotavirus vaccine effectiveness and impact studies in Latin America and all have consistently shown that the vaccine significantly reduces hospitalizations and death from diarrhea. It is estimated that approximately 8,600 deaths due to rotavirus were avoided in 2013 in the 15 countries that have introduced RVA in LAC.

Recommendations:

- TAG encourages all countries to introduce the rotavirus vaccine, in accordance with their epidemiological contexts, considering the current evidence demonstrating high vaccine effectiveness, cost-effectiveness and enormous impact in reducing morbidity and mortality from diarrhea in general and rotavirus diarrhea, specifically in the Americas.
- Countries should continue to assess the impact of RVA in order to adequately monitor the prevalence of circulating strains and changes in the epidemiological profile of the disease.

Influenza Vaccination in Tropical Areas

Background

Influenza virus illnesses and their complications contribute significantly to morbidity and mortality in the Americas. It is estimated that 40,880–160,270 influenza-associated deaths occur annually in this region. Timely and effective vaccination remains the best available measure to prevent severe influenza illness. Contrarily to countries from temperate zones in the Americas for which influenza seasons are well-defined, and thus allow for an optimal planning of vaccination, countries from the American Tropics, situated between the Tropic of Cancer and Tropic of Capricorn, that concentrate the great majority of Latin American and Caribbean countries have had difficulties characterizing the seasonality of influenza viruses circulation.

Progress in influenza vaccine use

There is considerable use of seasonal influenza vaccines in the Americas. As of 2014, 40 out of 44 countries/territories in Latin America and the Caribbean (LAC) have policies for influenza vaccination that reflect the most recent World Health Organization and TAG recommendations. Vaccination policies target most frequently healthcare workers and the elderly (in 38 countries), followed by individuals with chronic conditions (in 35 countries), pregnant women (in 27 countries) and healthy children (in 25 countries) or children suffering chronic conditions (in 5 countries). It is worth noting that vaccination of pregnant women has substantially increased, with seven countries targeting this group in 2008 to 27 in 2014. Vaccination coverage estimates reported in the region vary widely reflecting difficulties related to data quality and completeness, absence of precise denominators for vaccine coverage estimation and other operational challenges to completing vaccination schemes among vaccine-naïve children <9 years.

Progress in assessing influenza vaccine performance

With such widespread and high uptake of influenza vaccines in the LAC region, it is important to assess its performance in real-life settings. To date, there have been very few reports of vaccine effectiveness and impact from the region. This gap in knowledge makes it difficult for countries currently using the vaccine to sustain or expand investments to recommended target groups. Influenza vaccine effectiveness can vary widely between seasons, due to numerous factors including the match between the vaccine strains and circulating viruses, the adequacy of vaccine availability and timing, and host factors such as prior exposure to influenza viruses and to the vaccine, and the health status of the vaccine recipient. Thus, it is necessary to evaluate vaccine performance systematically and annually. Moreover, considering these yearly fluctuations in vaccine effectiveness, a valid evaluation of the impact of an influenza vaccination program would require information from various influenza seasons. In order to maximize the effect of vaccines, vaccination efforts should be concentrated prior to the highest concentration of influenza cases in the country. Late vaccination may only have limited benefits considering possible waning immunity and decreasing vaccine effectiveness as influenza viruses undergo antigenic changes.

Progress in defining seasonality of influenza virus circulation in the American Tropics

In recent years, countries in the American Tropics especially Central America such as El Salvador, Colombia, Cuba and Costa Rica, have made adjustments to their vaccination policies based on recent seasonality analyses. Using influenza surveillance data, secondary data, and varying methods, these analyses have led to changes in the vaccine formulation from the Northern Hemisphere to the Southern Hemisphere (SH) formulation and in vaccination timing from November to April-May. A review of

antigenic characterization data from Central America also suggested that the SH formulation corresponded to the most updated formulation available before the start of influenza seasons. Of 33 predominant antigenic virus strains identified in Central America during 2002–2014, 21 (64%, 95% CI 47%–80%) matched the SH recommendations and 24 (73%, 95% CI 58%–88%) matched the Northern Hemisphere recommendations.

Recommendations:

- TAG recognizes the progress of countries in strengthening influenza surveillance and expanding vaccine use across the region.
- TAG also congratulates countries on making evidence-based changes to their vaccination policies, including changes regarding timing of influenza vaccination programs and most appropriate vaccine formulation.
- TAG urges countries to continue generating evidence on disease burden, seasonality of influenza virus circulation, vaccine effectiveness and impact, using national data sources and appropriate methods.
- TAG also recommends continuing the current strategies in place, vaccinating intensively prior to the peak of highest burden of influenza illness, optimally reaching very high vaccination coverage through a single campaign. Influenza vaccine should then continue to be offered to the unvaccinated through the routine health services throughout the influenza season.
- TAG recommends that large countries carry out sub-regional seasonality analyses or stratify analyses by microclimates in order to inform vaccine use as needed.

Transitioning to the Use of Auto-Disable (AD) Syringes

Background

Injections are one of the most common health care procedures. Sixteen billion injections are administered annually worldwide and only five to 10 percent of these injections are provided by health care workers for the administration of a vaccine.

Safe injection practices, in the field of immunization, prevent the possibility of diseases like hepatitis B, hepatitis C, HIV from being transmitted, and the occurrence of events supposedly attributable to vaccination or immunization (ESAVI). In addition to promoting occupational health to workers in the health services, safe injection practices reduce the environmental risk to communities. Another aspect to consider is that the practice of safe injection, one of the key components of vaccine safety, is a measure that guarantees the progress being made by immunization programs and therefore has a significant impact on global vaccination coverage.

In 1999, the WHO, United Nations Children's Fund (UNICEF) and United Nations Population Fund (UNFPA) issued a joint policy declaration[7] on the use of self-deactivating syringes (AD) in immunization services. This declaration recommended that all countries adopt this document and implement the use of self-deactivated syringes in immunizations by the end of 2003.

According to this policy, this recommendation was based on the possible reuse of single-use syringes and needles, a practice that poses a high risk to public health. The community at large is also at risk when used injection equipment is not safely discarded. Self-deactivating syringes lower the risk of disease transmission from person to person because they cannot be reused, since they have a mechanism that disables the syringe from further use.

The WHO policy is focused on the use of self-deactivating syringes, which are pre-qualified after a review process of the dossiers. The WHO and the International Organization for Standardization (ISO) have developed quality standards[8].

The countries of LAC continue utilizing single use disposable syringes (SUDS), purchased through the PAHO Revolving Fund (RF), for their immunization programs. The quality of syringes and needles provided by the PAHO RF are verified through laboratory tests. In addition, PAHO also supports countries in building the testing capacity of the countries to carry out their own quality testing and verification.

[7] This joint policy revises and replaces the document WHO-UNICEF policy statement for mass immunization campaigns, WHO/EPI/LHIS/97.04Rev.1.It is issued by the World Health Organization, Geneva, Switzerland (Department of Vaccines and Biologicals), the United Nations Children's Fund (UNICEF) Programme Division, New York, USA and UNICEF Supply Division, Copenhagen, Denmark) and the United Nations Population Fund, New York. This policy is also the adopted practice of the international Federation of Red Cross and Red Crescent Societies in their operations.

[8] Standards for auto-disable syringes (ISO 7886-3; 7886-4), Performance specifications E8/DS1 and DS2 – OMS.

The current recommendations regarding safe injections from PAHO's Technical Advisory Group (TAG) XIII meeting, held in Canada in April 1999[9], are:

- The only way to ensure that used injection equipment is not reused is solely through the use of auto-disable syringes.
- All health workers should be informed on the danger posed by recapping a used needle.
- All countries using or introducing single use disposable syringes for vaccine administration should secure the funds to purchase: sufficient syringes, sufficient safety boxes for disposing used syringes and needles, supervision to document safe syringe disposal, and for the adequate collection/incineration of used injection equipment.
- PAHO should support studies to develop new technologies in the administration of safe injections.

In line with WHO policy, PAHO has begun promoting the use of self-deactivating syringes. The acquisition and use of these AD has been taking place in a progressive manner according to the ability of countries. Prior to introducing ADs, each country has to train health care workers in the handling and proper use of the new syringe designs. PAHO has informed all managers involved in the vaccination process on the benefits gained by the safety of the patient and the health professionals. Based on the training in the proper use of AD syringes and good safe injection practices, countries have partially begun introducing AD syringes into their programs. By 2005, only 5 countries had incorporated the use of ADs into their program. By 2015, 14 countries were using ADs for certain injections. Currently, 2 countries are using only AD syringes. Other countries have purchased a mix of AD syringes and conventional SUDS.

The benefits of using AD syringes are:

1. Reduction in the risk of re-use, thereby improving the safety of the patient, the health workers, as well as safety of the community.
2. The AD syringes come with a single scale, according to the administered dose for each vaccine, thereby reducing the risk of administering more or less dose-specific dosage of the vaccine.
3. There is less dead space in the hub of the needle, resulting in less vaccine remaining in the hub; therefore there is less vaccine wastage.

PAHO has strengthened the mechanisms for procurement syringes, not only in the review of documents and verification of compliance with the established requirements by the providers, but PAHO also performs quality verification through testing under specific standards of manufacturing, design and quality.

PAHO's priorities are:

- To promote the practice of safe injections as a component of vaccine safety.
- Introduction of new technologies, like self-deactivating syringes.
- Ensure syringe quality.
- Develop capacity in countries for verifying quality assurance.
- Training in risk management, management of new technology, waste disposal of sharps.

[9] TAG Recommendations, Meeting XIIII in Canada, April 1999

- Provide technical cooperation in following-up good safe injection practices in disposing of sharps.
- Provide technical assistance to countries to assess syringe quality, as well as develop and implement a national policy for safe injection.

PAHO, through the EPI and the RF, acquires an average of 188,224,000 syringes annually. 69% are single use disposable syringes and 31% are self-deactivating syringes for EPI programs in the Region. To ensure the quality, effectiveness, and safety of syringes and other products used in the immunization programs, PAHO's Comprehensive Family Immunization Unit (FGL/IM) conducted an analysis of the processes for planning, procurement and distribution, the use of injection equipment and disposal for both types of syringes. The resulting analysis shows the need to establish an action plan to validate compliance with the international standards of quality, safety, and the WHO guidelines for these products, as well as develop the institutional capacity in developing countries for testing and verifying product quality.

Recommendations:

- TAG recommends that, by the end of 2020, all countries should only use auto-disable (AD) syringes for immunization.
- Training must be conducted before introducing new AD syringe technology.
- Countries should plan the training, supervision and sensitization activities with assistance from PAHO.
- All countries should follow and strengthen good injection safety practices and the management of safe waste disposal operations.
- All countries using standard syringes or introducing AD syringes for vaccine administration should seek funding for:
  - The purchasing of sufficient syringes and safety boxes to safely dispose of syringes and sharp materials.
  - The documentation of safe syringe disposal.
  - The proper collection/incineration of used injection equipment.

Control /Elimination of Hepatitis B in the Americas

Hepatitis B virus (HBV) infection is a leading cause of infectious disease mortality worldwide with an estimated 4 million new HBV infections and 780,000 deaths annually. It is preventable with vaccination. The World Health Organization (WHO) estimates that worldwide more than 2 billion people are infected with HBV, of whom 240 million have a chronic infection. Most HBV-related morbidity and mortality result from complications of chronic infection: cirrhosis and hepatocellular carcinoma (HCC). It is estimated that 15-25% of people with chronic HBV infection will die prematurely from HBV-related cirrhosis or HCC.

The risk of chronic infection is inversely related to the age at infection. Chronic infection develops in up to 90% of infants infected during the perinatal period, 20-60% of young children infected in the post-perinatal period through five years of age, and in <5% of children, adolescents, and adults with infections acquired after five years of age. Globally, two-thirds of HBV-related deaths result from infection acquired in the perinatal and early childhood period, underscoring the need routine infant hepatitis B immunization, with the first dose administered at birth, as the cornerstone of a hepatitis B prevention strategy.

Regionally, HBV infection is not distributed homogeneously. The prevalence of chronic infection as measured by the seroprevalence of the hepatitis B surface antigen (HBsAg) among 5-9 year old children in the Americas varies from low (<2%) in Brazil, Canada and the USA to low-intermediate (2-4%) in Argentina, Chile, Colombia, and Mexico to high-intermediate (5-7%) in Bolivia, Ecuador, and Peru. Within a country there may be ethnic, geographic, and socioeconomic, and differences in the prevalence of the infection.

The WHO is currently developing a 2016-2021 Global Health Sector Strategy (GHSS) on viral hepatitis, with the plan to submit it to the 69th World Health Assembly in 2016. The GHSS responds to specific requests included in resolution WHA67.6 of 2014, asking WHO to assess the feasibility of elimination of HBV infections as public health problems.

The WHO is promoting the elimination of HBV infection by the year 2030. The feasibility of HBV elimination was determined through modeling studies. The results of these studies were used to set the targets that include eliminating HBV by 2030 through a combination of high routine 3-dose infant vaccination coverage, high birth dose coverage, and the scale up of treatment services for persons with chronic HBV infection. Elimination of mother to child transmission (EMTCT) of HBV infection is considered a milestone on the road to HBV elimination. Of note, the Region of the Americas is committed to a Dual Elimination Initiative for mother to child transmission of HIV and syphilis.

Three doses of the hepatitis B vaccine, with the first dose administered within 24 hours of birth and the remaining doses given per the recommended schedule, can prevent approximately 95% of cases. Currently, WHO and SAGE recommendations to reduce perinatal and early childhood transmission emphasize the importance of a birth dose of hepatitis B vaccine administered within 24 hours of birth, followed by two or three doses to complete the series. Hepatitis B immune globulin (HBIG) prophylaxis in conjunction with HBV vaccination may offer minimal additional benefit to newborn infants whose mothers are HBsAg positive, particularly if they are also hepatitis B “e” antigen (HBeAg) positive.

However, the use of HBIG is not feasible in most countries due to program logistics (lab-based screening program to identify HBsAg-positive mothers) and due to the supply and cost of HBIG.

In the Guidelines for the Prevention, Care and Treatment of Persons with Chronic Hepatitis B Infection, launched in 2015, the WHO recommended treatment of pregnant women with tenofovir, but no recommendation was made for the routine use of antiviral therapy to prevent mother-to-child-transmission of HBV.

In the Americas in 2014, regional coverage with three doses of the hepatitis B vaccine among children less than one year of age was 90%. However, only 18 of 44 countries and territories in the Region currently include a birth dose of the hepatitis B vaccine in the national infant immunization schedule (source: WHO/UNICEF Joint Reporting Forms).

Given that the WHO is considering the elimination of HBV as a goal for 2030, the Americas should consider regional and country level control strategies, with an overall strategy of high 3-dose vaccine coverage, the implementation of birth dose vaccination and treatment of chronic HBV infection, and leading to the elimination of HBV mother-to-child transmission as a milestone towards HBV elimination.

Recommendations:

- **Coordination**
  - PAHO should continue the inter-programmatic work that brings together the maternal and child health services units, the Latin American Center for Perinatology (CLAP), the Comprehensive Family Immunization Unit, HIV/AIDS/STI/TB and Hepatitis Unit, Occupational Health Unit, Legal Office, among others, in order to support Member States in their evaluation of the feasibility of HBV elimination as a public health problem. PAHO should also support developing strategies, and identifying gaps that need to be addressed in order to achieve this goal by 2030.

- **Vaccination and monitoring**
  - TAG reminds countries to introduce the birth dose of the hepatitis B vaccine, i.e., the first dose within 24 hours after birth, in countries that have not already introduced it.
  - Countries should monitor the administration of the birth dose within 24 hours of birth and reach at least 80% coverage, in all countries.
  - Countries should document prevalence of hepatitis B infection among pregnant women and strengthen hepatitis surveillance.
  - TAG reiterates previous recommendations on hepatitis B vaccination for children, healthcare workers, and other high-risk groups.
  - PAHO and countries should evaluate the current status of hepatitis B control and the feasibility of hepatitis B elimination, so that TAG can assess their progress and the feasibility of eliminating hepatitis B at the regional level.