



Short communication

The Caribbean Immunization Technical Advisory Group (CITAG); A unique NITAG [☆]

Tracy Evans-Gilbert ^{a,*}, Karen N. Lewis-Bell ^b, J. Peter Figueroa ^c

^a Department of Pediatrics, Cornwall Regional Hospital, Montego Bay, Jamaica

^b Pan American Health Organization, Mona, Kingston, Jamaica

^c Department of Community Health and Psychiatry, The University of the West Indies, Mona, Kingston, Jamaica



ARTICLE INFO

Article history:

Received 28 June 2019

Received in revised form 4 September 2019

Accepted 9 September 2019

Available online 16 September 2019

Keywords:

National Immunization Technical Advisory Group (NITAG)

Evidence-based policy

Decision-making

Health policy

Capacity building

Routine immunization

ABSTRACT

The Global Vaccine Action Plan 2011–2020 called for all countries to establish a National Immunization Technical Advisory Group (NITAG) by 2020. The Caribbean, with its unique geographical context of 22 countries/territories, had limited technical expertise to establish individual NITAGs in small countries. The Caribbean Immunization Technical Advisory Group (CITAG) was launched in 2018. This paper describes the Caribbean context for a common framework for policy and evidence-based decision-making for immunization. Challenges in immunization in the region are reviewed and potential solutions are outlined. A recent decline in immunization rates in the Caribbean, along with outbreaks of vaccine-preventable diseases globally, places the region, a premier tourist destination, in a vulnerable position. The CITAG aims to strengthen the policy and evidence-based decision-making process for immunization to enable the Caribbean to remain at the forefront of vaccine-preventable disease elimination.

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1. Introduction

Over the last two decades, developments in molecular genetics have influenced applications of immunology, microbiology, and genomics to vaccine development. Such developments have resulted in a broad spectrum of available vaccines with improved efficacy. As a result, global and national policymakers must make decisions concerning the approval of vaccines, expansion of the immunization schedule, and access to funding. Evidenced-based decisions are required amidst limited resources and multiple health priorities.

The World Health Organization (WHO) and its partners have supported and advocated for the development of National Immunization Technical Advisory Groups (NITAGs) to guide a country's

national immunization programs and policies [1]. A NITAG is a multidisciplinary group of national experts who provide independent, evidence-informed advice to policymakers and program managers on policy issues related to immunization and vaccines [1,2]. The Global Vaccine Action Plan 2011–2020 called for all countries to establish or have access to a NITAG by 2020 [3]. Most industrialized and some developing countries have formally established national technical advisory bodies to guide immunization policies, with 134 of 186 member states declaring a NITAG [4]. The main purpose of the NITAGs is to place the global and regional recommendations of the WHO, along with scientific evidence, into a local context with consideration of the differences in national budgets, disease epidemiology, and health priorities.

The English- and Dutch-speaking Caribbean includes 22 countries/territories with varying population densities, some of which are too small and have limited technical expertise to establish individual NITAGs. This paper outlines the establishment of the sub-regional Caribbean Immunization Technical Advisory Group (CITAG) against a historical background of collaborations in health in the Caribbean Community (CARICOM), which paved the way for a common framework for policy and evidence-based decision-making for immunization. The role of the CITAG in addressing contemporary challenges in the region was explored.

[☆] Members of the CITAG include Professor J Peter Figueroa (Chair and epidemiologist), Dr. Elizabeth Ferdinand (Public Health), Dr. Gabriel Gonzalez Escobar (microbiologist), Dr. Philippe Duclos (epidemiologist; University of Geneva, Director of the ADVAC and formerly SAGE Executive Secretary), Dr. Tracy Evans-Gilbert (pediatrics and tropical medicine) and *ex-officio* members Dr. Karen Lewis-Bell (Sub Regional Advisor on Immunization, PAHO) and Dr. Rudolph Cummings (Program Manager, Health Sector Development, CARICOM).

* Corresponding author.

E-mail addresses: tracy.gilbert@wrha.gov.jm (T. Evans-Gilbert), lewisbek@paho.org (K.N. Lewis-Bell), peter.figueroa10@gmail.com (J.P. Figueroa).

2. History of expanded program on immunization (EPI) and its framework

The Caribbean has been a global leader in vaccine-preventable disease elimination. The last cases of locally transmitted vaccine-preventable diseases were those of rubella in 2000, congenital rubella syndrome (CRS) in 1999, diphtheria in 1995, measles in 1991, and polio in 1982. This success was achieved largely through: establishment of the EPI in territories of the English- and Dutch-speaking Caribbean; the strong technical support of the Pan American Health Organization (PAHO) EPI team; and collaboration among countries, facilitated by the annual meeting of Caribbean EPI managers. Technical guidance from PAHO's Technical Advisory Group on Immunization and WHO's Strategic Advisory Group of Experts, along with the strategic vision for disease elimination through vaccination from the Council for Human and Social Development (COHSOD) of CARICOM, facilitated these achievements. Table 1 provides a historical timeline of EPI in the Caribbean [5]. For sustainability, the EPI proceeded at the pace of the country's resources. Apart from Guyana and Haiti, who receive Global Alliance for Vaccines and Immunization funding, 90–100% of the cost of countries' EPI was borne by governments. PAHO TAG and EPI meetings held annually were participatory with a shared vision which motivated the EPI managers and their national teams.

In 1984, the CARICOM Conference of Ministers Responsible for Health identified the need for a collaborative mechanism to promote technical cooperation and health development in Caribbean countries. The Caribbean Cooperation in Health (CCH) was instituted in 1986. This provided a mechanism through which member states of the CARICOM could focus action and resources collectively towards the achievement of agreed common priority objectives in health. In addition, the CCH would identify the approaches and activities for joint action and Technical Cooperation among Countries in support of capacity-building for achievement of the objectives. Seven priority areas were identified, among them was increasing the capacity to prevent and control communicable diseases, including vaccine-preventable diseases [6]. Through the CCH and COHSOD of CARICOM, resolutions were proposed to eliminate polio, measles, rubella, and CRS from the Caribbean. This

strategy resulted in the planning and implementation of coordinated mass vaccination catch-up and follow-up campaigns in various countries/territories.

Against this background, a concept note for establishment of the CITAG was developed with support from PAHO in 2016, and finalized in 2017. The idea was to develop a sub-regional body and to integrate its meeting with the annual meeting of EPI managers. In September 2017, the principle of the CITAG was presented formally to the COHSOD and established through a ministerial resolution. The CITAG was launched at its inaugural meeting during the 33rd Caribbean Immunization Managers' Meeting in February 2018. The group comprised experts in epidemiology, public health, microbiology, pediatrics, and tropical medicine. The Secretariat includes two *ex officio* members: the CARICOM Program Manager, Health Sector Development, and the PAHO Advisor on Immunization, Caribbean Sub-Region [7].

Selection of CITAG members was conducted by a committee, which included the CITAG chair, the CARICOM Program Manager of Health Sector Development, and the PAHO Advisor on Immunization, Caribbean Sub-Region, along with two distinguished independent experts. The selected members were independent and credible in their field of expertise; they did not represent any affiliated organization, national immunization program, or private-sector interest groups. Experts were selected from different countries within the region. The core members signed a written declaration of interest to ensure transparency with independent decision-making, which was free of outside influences and was guided by written terms of reference [8]. The term of office was designated as 3 years with the possibility of renewal for a maximum of two terms. Face-to-face meetings are held annually at the meeting of EPI managers. Due to the small number of core members and diversity among the 22 countries, CITAG would co-opt representatives from among the countries or territories to sit on sub-committees or technical working groups. Recommendations to National Immunization Programs would be presented in the form of position papers or summarized written recommendations from meetings transmitted officially to Ministries of Health.

3. Contemporary challenges in the region

Historically, the Caribbean has led the world in the achievement of immunization goals. However, immunization rates have fallen in recent years. Up to 2015, the immunization coverage for the sub-region had reached a high of 95% for polio (polio3), diphtheria-tetanus-pertussis (DTP3), *Hemophilus influenzae* B (Hib3), hepatitis-B virus (HepB3), and measles-mumps-rubella (MMR1), and 90% coverage for MMR2. Within countries, however, there was increased variability, with 20–26% of districts having coverage <90% for polio3, DTP3, Hib3, HepB3, and MMR1, and 43% of districts having coverage <90% for MMR2. In 2017, there was a decline in vaccination coverage for DTP3 from 94% in 2015 to 91%, with eight of the 22 countries/territories documenting districts with <80% coverage [9].

The causes of these declining immunization rates are multiple and complex. However, four main causes can be postulated. These include (1) population movement resulting from natural disasters; (2) challenges with data quality in terms of accurately defining the target population with births occurring overseas and movement of persons between the islands; (3) lack of targeted legislation supporting vaccination; and (4) the availability of vaccines due to financial constraints.

Hurricane Ivan may have contributed to a decline in immunization coverage in 2017, especially in the British Virgin Islands, where ~25% of people left the islands following the hurricane. In 2017, 15 of the 22 countries/territories reported stockouts of at

Table 1
Timeline of expanded programs in immunization (EPI) in the Caribbean.

1977	EPI in the Region of the Americas established by PAHO Immunization Officer for the Caribbean appointed by PAHO The Caribbean Epidemiology Centre (CAREC) located in Trinidad and Tobago provides administrative support for the Immunization Officer and laboratory analysis and surveillance of targeted diseases Caribbean Conference of Ministers for Health (CMH) alerted to the role of the EPI in disease control
1978	EPI manager designated by each country to manage National Programs Collaboration with the Immunization Officer and CAREC is established PAHO Revolving Fund established for vaccine purchases
1979	Training of Senior nurses and EPI managers USAID provide assistance in the purchase of cold chain equipment
1980	Annual PAHO TAG meetings instituted
1981	Annual EPI meetings instituted
1982	Elimination of polio in the English- and Dutch-speaking Caribbean
1986	The Caribbean Cooperation in Health instituted
1988	CARICOM Ministers of Health resolve to eliminate indigenous measles from the Caribbean by 1995
1991	Elimination of measles in the Caribbean sub-region
1995	Elimination of diphtheria in the Caribbean sub-region
1998	Council for Human and Social Development resolve to eliminate rubella and congenital rubella syndrome by the end of year 2000
1999	Elimination of CRS in Caribbean sub-region
2001	Elimination of rubella in Caribbean sub-region

least one vaccine. Eight of those countries indicated debt to the Revolving Fund for Vaccines (RFV) or delayed payments as the reason. Nine of the 22 countries/territories have a dedicated budget line for immunization to ensure sustained supplies; however, this primarily covers the cost of vaccines and not all components of the vaccination program. Several Caribbean countries are facing serious economic challenges, resulting in outstanding debts (>60 days) to the PAHO RFV. The Caribbean had set a goal of eliminating mother-to-child transmission of the hepatitis-B virus by introducing a dose of the hepatitis-B vaccine at birth. However, this process, along with the introduction of pneumococcal and human papillomavirus (HPV) vaccines, has been slow.

Sixteen of 22 countries/territories have legislation requiring the vaccination of children, mainly for admission to schools. The legislation does not specify the need for vaccination, in keeping with the immunization schedule, during the first 2 years of life. Only two countries restrict exemptions from vaccination for medical reasons only, whereas eight countries allow exemptions for religious or philosophical beliefs. Six countries have no immunization legislation.

The recent decline in immunization rates places the Caribbean in a vulnerable position because it is a premier tourist destination that receives visitors from all over the world. A decline in coverage for vaccines globally, resulting in outbreaks of measles, rubella, diphtheria, and whooping cough, increases the risk of exposure to unimmunized and underimmunized populations in the Caribbean. In addition, neighboring countries in the Americas with outbreaks of measles, diphtheria, and yellow fever pose a threat to pockets of unvaccinated populations. The increasing global trend of vaccine hesitancy has also impacted the Caribbean, and revised strategies are needed to improve the acceptance of vaccines.

4. CITAG Plan of Action

With newer vaccines targeting the life course, the immunization program has transitioned from a child focus to that of the family. Based on the challenges experienced in the Caribbean, immunization gains must be sustained to pave the way for routine introduction of these newer vaccines using a strong evidence-based approach and economic analyses. The CITAG proposed an expanded concept of the traditional NITAG to address these challenges and empower national authorities to make evidence-based decisions. This includes advocacy for planning, preparedness and policy mitigation for natural disasters; improved data quality for decision-making through use of electronic immunization registers; model legislation on immunization that would be adapted in each country/territory; policies that would ‘ringfence’ budgetary allocations for vaccination programs. Improvements in existing legislation would state the public-health basis for vaccination and address exemptions for medical reasons only. In addition to promoting the value of vaccines and engendering vaccine confidence by sharing information with key stakeholders, the CITAG would update the Caribbean Health Ministers, through COHSOD, on the status of immunization in the Caribbean and make recommendations on identified gaps. In conjunction with other regional or international organizations working in immunization or related areas, scientific updates would be reviewed and applied in the context of the Caribbean. Currently, 15 vaccines are recommended by PAHO EPI to target diseases such as *Hemophilus influenzae* type b, hepatitis-B virus infection, mumps, rubella, influenza, yellow fever, pneumococcus, rotavirus, and HPV. Specific areas of focus are to accelerate introduction of the birth dose of the hepatitis-B vaccine, pneumococcal vaccine and the sixth booster dose of tetanus toxoid and improve uptake of the HPV vaccine.

5. The way forward

The Caribbean has long served as a model for small countries or regions for developing immunization strategies and practices. The region’s newly developed CITAG, which is in keeping with the recommendations of the Global Vaccine Action Plan and PAHO’s Regional Immunization Action Plan for the Americas, plays a pivotal part in continuing with this creative leadership. It will strengthen existing linkages, consolidate and prioritize technical guidance from external experts into a Caribbean context, and provide an objective, strategic direction, and expert guidance for the governments through scientifically rigorous analyses.

The WHO supports a Global NITAG Network that facilitates cross-country exchange and peer-learning, [10] which could aid in strengthening the functionality of the CITAG [11]. However, the CITAG faces significant practical hurdles to realizing its potential. Data on the cost of operating a NITAG effectively are limited [12], but most NITAGs from low- and middle-income countries need support for sustainability [13]. To overcome this challenge, CITAG proposes the gathering of country-specific data during EPI meetings, as well as recruiting additional Caribbean specialists who reside locally and overseas in a wider range of areas (including communication, immunization law, and health economics) and identifying funding to support the Secretariat. Utilizing published vaccine analyses from established NITAGs would reduce duplication of efforts, and involving academic and postgraduate students in research activities could offset the limitations in skilled staff.

The CITAG is building on an existing framework of health collaboration in the CARICOM, with a record of success in the EPI. Creative solutions and global partnerships for funding and expertise to support data collection/analyses, training, country-specific studies, or other initiatives will assist in addressing operational challenges.

Authorship

All authors attest they meet the ICMJE criteria for authorship.

Funding source

This research did not receive a specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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