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A review of immunization legislation for children in English- and Dutch-speaking Caribbean countries

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ABSTRACT

Objective. To assess the legislative frameworks concerning childhood vaccination in the English- and Dutch-speaking Caribbean and propose a model legislative framework for Caribbean countries.

Methods. This study included a survey of 22 countries and territories in the Caribbean regarding legal vaccination mandates for school entry, budget allocations, sanctions, or exemptions. A legal consultant conducted a comprehensive search and analysis of legislation regarding vaccination among 13 Caribbean countries/territories. A comparative analysis of the legislation under five themes—legislative structure, mandatory vaccination, national immunization schedule, sanctions, and exemptions—formed the basis for the proposed model legislation.

Results. Among the 22 Caribbean countries/territories, 17 (77%) had legislation mandating vaccination, 16 (94%) mandated vaccination for school entry, 8 (47%) had a dedicated budget for immunization programs, and 13 (76%) had no legislated national schedules. The source of legislation includes six (35%) using the Education Act, eight (47%) the Public Health Act, and five (29%) a free-standing Vaccination Act. Three countries/territories—Jamaica, Montserrat, and Saint Lucia—had immunization regulations. In 12 (71%) of the 17 countries with legislation, sanctions were included, and 10 (59%) permitted exemptions for medical or religious/philosophical beliefs.

Conclusions. Several countries in the Caribbean have made failure to vaccinate a child an offense. By summarizing the existing legislative frameworks and approaches to immunization in the Caribbean, the analysis guides policymakers in making effective changes to immunization legislation in their own countries.

Keywords Immunization; legislation; evidence-informed policy; decision making; health policy; pediatrics; Caribbean region.

Mandatory pediatric immunization is relatively common globally (1, 2) and varies with the immunizations required, population groups, grounds for exemptions, and penalties for non-compliance (1–3). The most common mandates of national immunization programs are related to school entry for children to protect against childhood diseases. Among Global NITAG (National Immunization Technical Advisory Group) Network (GNN) countries, mandatory vaccine policies are found mainly among high-income and upper-middle-income countries compared with lower-middle-income and low-income countries. Moreover, they are most prevalent in the Americas compared with other World Health Organization (WHO) regions (1).

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In Latin America and the Caribbean, commencing in the 1980s and 1990s, public health laws played a role in successful national immunization programs in the region, contributing to polio and other disease eradication campaigns, but varied in their legal framework (4).

Historically, legislation and policies governing immunization in countries such as Australia, the United Kingdom, and the United States of America have contributed to achieving and sustaining high vaccination coverage rates and have greatly reduced disease outbreaks among school-aged children (5–6). Policies or legislation governing school entry requirements, complex administrative procedures required to obtain exemptions, and penalties have proved to be effective methods for improving vaccination coverage rates (6).

The English- and Dutch-speaking Caribbean successfully eliminated polio in 1982, measles in 1991, diphtheria in 1994, congenital rubella syndrome in 1999, neonatal tetanus in 2000, and rubella in 2001 (7). These achievements followed the establishment of the Expanded Program on Immunization (EPI) in 1977 and measures to strengthen the institutional structures of immunization and surveillance programs at national and regional levels as well as systematic activities and campaigns to eliminate these diseases. The Revolving Fund of the Pan American Health Organization (PAHO) ensured a ready supply of vaccines at reasonable cost. Countries took ownership of their EPI programs and provided 95% or more of their financing, with only Guyana receiving support from GAVI, The Vaccine Alliance. For sustainability, countries were encouraged to secure a budget line for the EPI program and national vaccine supplies. Vaccine laws provided a legal framework to ensure a specific budget allocation for vaccine purchases in Latin American and Caribbean countries (4, 7, 8). The expansion of legal frameworks concerning vaccination accompanied improvement in national immunization program performance and national immunization financing (4). Through legislation in public health and education, 80% of countries in the subregion have mandatory vaccination requirements for school entry (9).

Traditionally high immunization coverage in the Caribbean has declined from 2015–2020, with many districts reporting coverage of childhood vaccines below 80%. The decline in immunization coverage has been exacerbated by the COVID-19 pandemic. Additionally, a decline in the surveillance of suspected measles, rubella, and polio cases occurred in the Caribbean in 2020 (10). Vaccine misinformation, manipulated information, and conflicting information promoted on digital platforms during the COVID-19 pandemic potentially reduced confidence in vaccines. Prior to the COVID-19 pandemic, a social movement opposing public health vaccinations resulted in the increased allowance of nonmedical exemptions (NMEs) and the re-emergence of vaccine-preventable diseases (VPD) (11). This changing view regarding vaccination threatens to erode existing public health achievements toward VPD elimination.

The influx of tourists (12) far exceeds the combined population of 7 million persons in the English- and Dutch-speaking Caribbean (13). Considering the emerging public health threat of the reintroduction of VPDs in the Caribbean and the global public health crisis of under-immunization of children, an urgent review of current vaccine policies and legislation is necessary. It should accompany other strategies to ensure accessibility to vaccines and interventions to improve uptake of vaccines and reduce disease outbreaks (6). Mass communication campaigns integral to the success of measles and rubella elimination, lessons learned, and best practices should be reinforced (14).

This review aligns with one of the objectives of the second strategic priority of the Immunization Agenda 2030 (IA 2030), to build and sustain a strong political and financial commitment to immunization at all levels (15). It also aims to assess the legislative frameworks concerning childhood vaccination in the English- and Dutch-speaking Caribbean and propose a model legislative framework for Caribbean countries.

MATERIALS AND METHODS

This was a descriptive study of the legislation and regulations concerning vaccination in children among English- and Dutch-speaking countries and territories in the Caribbean, which include Anguilla, Antigua and Barbuda, Aruba, The Bahamas, Barbados, Belize, Bermuda, British Virgin Islands, Cayman Islands, Curaçao, Dominica, Grenada, Guyana, Jamaica, Montserrat, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Sint Maarten, Suriname, Trinidad and Tobago, and Turks and Caicos Islands.

An Act of Parliament is defined as a law or statute passed by the Parliament after debate in both Houses. Under the Act, a regulation is passed that details how an Act should be implemented, and this is also known as "subsidiary legislation." Acts such as the Public Health Act, Vaccination Act, and Education Act give the general framework from which health regulations concerning vaccination are drafted. Policies are statements of intent that guide government decisions and actions in what it can achieve for society. Policies are documents not laws, but can lead to the formation of new laws. Vaccination policies that were not laws or regulations were not reviewed.

The study was conducted in two phases. During the first phase, an online survey was conducted among EPI managers of 22 English- and Dutch-speaking countries and territories in the Caribbean. The survey, distributed by email, consisted of a structured questionnaire on five broad themes: the presence of legislation mandating vaccination, legal vaccination mandates for school entry, and the presence or absence of sanctions, exemptions, and a dedicated budget line for EPI. In addition, there were open-ended questions on the year of legislation, source of legislation, and the description of sanctions if present. To minimize nonresponse, the survey was kept short and emailed reminders were sent. The information was summarized and tabulated.

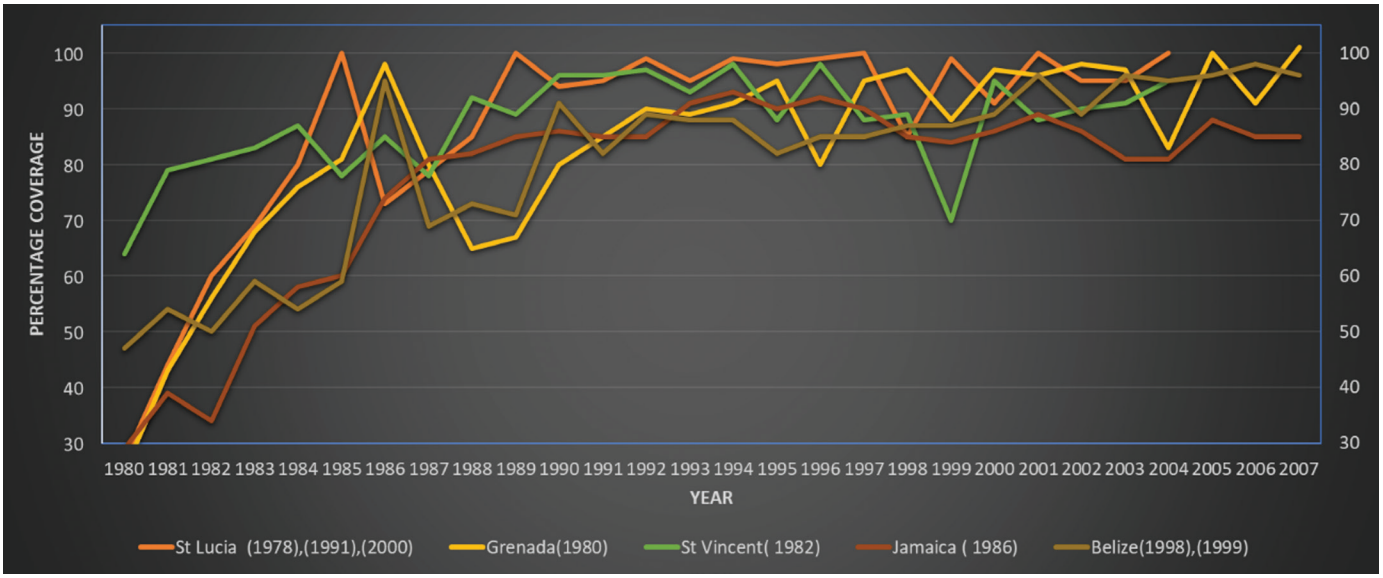
During the second phase, a legal consultant conducted a comprehensive search and analysis of all laws and regulations regarding vaccination among the 13 countries and territories. A comparative study of the frameworks applied in each country/territory was conducted by the research team, which was comprised of the authors and two legal consultants. The analysis was categorized according to five domains: legislative structure, mandatory vaccination, presence of a national immunization schedule, exemptions, and sanctions.

A model legislative framework was then derived from these analyses and a review of the literature.

RESULTS

Among the 22 English- and Dutch-speaking Caribbean countries and territories examined, 17 (77%) had currently active

FIGURE 1. DTP3 coverage by year in five Caribbean countries with legislation between 1978 and 1998*



Note: *Year of legislation and amendment in parentheses.
Source: Figure prepared by the authors based on 1980–2007 data from the WHO/UNICEF Estimates of National Immunization Coverage (WUENIC) database. Available from: https://immunizationdata.who.int.

legislation mandating vaccination. Table 1 provides a background of immunization legislation in the Caribbean against the timeline of the EPI program and VPD elimination. Seven countries enacted immunization laws prior to the formation of the EPI in 1977, four between 1986 and 1998 and six from 2004 to 2013. Figure 1 shows diphtheria–tetanus–pertussis third dose (DTP3) coverage between 1980 and 2007 in five Caribbean countries with legislation between 1978 and 1998. The figure suggests an increase in vaccination coverage in all five countries following vaccination legislation and institutionalization of vaccination activities. In Belize, the Public Health Act was instituted in 1946 and DTP3 coverage was below 50% in 1980. After the EPI and other regional immunization activities were instituted, coverage rates increased to 82%–89% for about a decade. The Family and Children's Act was passed with the adoption of the Convention on the Rights of the Child in 1998, followed by a revision of the Public Health Act in 1999. Immunization coverage rates increased to greater than 95% from 2001 to 2007, peaking at 98% in 2006. In Saint Lucia, immunization coverage rates were 27% in 1980, increased to 89% in 1987 and to 95%–99% between 1989 and 2005. Regulations under the Public Health Act in 1991 stipulated a legal requirement for vaccination prior to school entry. Table 2 summarizes countries with existing legislation. The five countries and territories without legislation were Aruba, Cayman Islands, Curaçao, Sint Maarten, and Turks and Caicos Islands. Most English-speaking Caribbean countries have not revised their legislation governing immunization. Barbados, Belize, Jamaica, Saint Lucia, and Saint Vincent and the Grenadines have amended their immunization legislation in 2018, 2010, 2013, 1991, and 2009, respectively (Table 1 and 2). Most countries (16, 94%) mandated vaccination for school entry. The source of legislation varied, with six (35%) using the Education Act, eight (47%) the Public Health Act, and five (29%) a free-standing Vaccination Act. Three countries and territories—Jamaica, Montserrat, and Saint Lucia—had immunization regulations under the Public Health Act. In 12 (71%) of the 17 countries with legislation, sanctions were included, and 10 (59%) permitted exemptions for medical or religious/philosophical beliefs. Among the countries with an existing legislative framework, 8 (47%) included a dedicated budget for the EPI.

A comparative analysis of the legislation is summarized in Table 3. The legislative frameworks varied among countries. Legislative structures without an Act of Parliament specifically dealing with vaccination tend to have regulations under their Public Health or Education Acts. All vaccination legislation in the countries reviewed, whether expressed or implied, provide the right for every parent or person having custody of a child to vaccinate the child. The time frame to commence vaccination varied, ranging from no age stipulation to before 3, 6, or 12 months.

While some acts and regulations, such as the Immunization of Children Act for Saint Vincent and the Grenadines and the Public Health Regulations (Communicable and Notifiable Disease) of Saint Lucia, are silent on the specific time frame that vaccination should be done, most legislations provide a requirement that the vaccination should be done before registering a child in a school. Vaccination as a public good was not explicitly stated. However, most countries provide vaccinations for free as a public good.

A national vaccination schedule was not stipulated in 13 (76%) countries or was limited in coverage among the schedules that were included. Newer vaccines such as pneumococcal or human papillomavirus (HPV) vaccines were not mentioned. Historically, all countries and territories were conducting routine immunization with the DTP, polio, measles, and bacillus Calmette–Guérin (BCG) vaccines in 1980 (16). In 2002–2006, all countries/territories in the subregion introduced the childhood vaccines for hepatitis B and *Haemophilus influenzae* type b as well as the routine second dose of the measles, mumps, and rubella (MMR) vaccine (MMR2) (7). Certificates for medical exemptions included different times for renewal ranging from

TABLE 1. Timeline of the Expanded Program on Immunization, vaccine-preventable disease elimination, and immunization legislation by Caribbean country/territory

Year	Timeline of the Expanded Program on Immunization, vaccine-preventable disease elimination, and immunization legislation	
1860	Bahamas	Vaccination Act
1943	Belize	Public Health Act
1960	Suriname	Education Act
1969	Barbados	Health Services Act
1973	Trinidad and Tobago	Public Health (Nursery Schools and Primary Schools) Immunization Act
	Antigua and Barbuda	Education Act
1974	Guyana	Public Health (School Children) Immunization Act
1977	EPI in the Region of the Americas established by PAHO	
1978	PAHO Revolving Fund established for vaccine purchases	
	Saint Lucia	Public Health Act
1980	All countries and territories were conducting routine immunization with the diphtheria-pertussis-tetanus (DPT), polio, measles, and bacillus Calmette–Guérin (BCG) vaccines	
1982	Elimination of polio in the English- and Dutch-speaking Caribbean	
	Saint Vincent and the Grenadines	Immunization of Children Act
1986	Jamaica	Public Health (Immunization) Regulations
1988	CARICOM Ministers of Health resolve to eliminate indigenous measles from the Caribbean by 1995	
1991	Elimination of measles in the Caribbean subregion	
	Saint Lucia	Public Health (Communicable and Notifiable Diseases) Regulations Amendment
1992	Dominica	The Compulsory Vaccination Act
1995	Elimination of diphtheria in the Caribbean subregion	
1998	Council for Human and Social Development resolve to eliminate rubella and congenital rubella syndrome by the end of year 2000	
	Belize	Families and Children's Act
1999	Elimination of congenital rubella syndrome in the Caribbean subregion	
	Belize	Public Health Act Amendment
2001	Elimination of rubella in the Caribbean subregion	
2002–2006	All countries/territories in the subregion introduced the childhood vaccines for hepatitis B and *Haemophilus influenzae* type b, as well as the routine second dose of the measles, mumps, and rubella vaccine (MMR2)	
2004	British Virgin Islands	Education Act
	Bermuda	Education Act
2005	Saint Kitts and Nevis	Education Act
2009	Saint Vincent and the Grenadines	Immunization of Children Act Amendment
2010	Belize	Health Services Act Amendment
2011	Anguilla	Education Act
2013	Jamaica	Public Health regulations Amendment

***Source*:** Prepared by the authors; information on the Expanded Program on Immunization based on reference (7).

2 to 3 months. Among countries with sanctions, the fees were outdated and insufficient to be considered useful deterrents with few exceptions. The fines ranged from the equivalent of US$ 0.09–92 in Belize, Bahamas, Dominica, Grenada, Montserrat, and Saint Lucia, whereas Jamaica imposed a penalty of J$ 1 million, equivalent to approximately US$ 6 500. Sanctions in most legislation focused on the parents of unvaccinated children, while legislation such as the Immunization of Children Act for Saint Vincent and the Grenadines is comprehensive in its approach. It incorporates parents, persons who willfully sign false certificates, and health officers or medical practitioners who knowingly administer expired vaccines.

DISCUSSION

In the Caribbean, immunization legislation was enacted before, during, and after the establishment of the EPI in the region. Most countries and territories have adopted legislation requiring vaccination, with a mandate for school entry, and these varied within the legal framework. The five countries and territories without legislation are Aruba, Cayman Islands, Curaçao, Sint Maarten, and Turks and Caicos, which are dependent territories subject to legislation of either the United Kingdom or the Netherlands. Some United Kingdom Overseas Territories such as the British Virgin Islands, Montserrat, and Bermuda have

TABLE 2. Legislation and regulations in 22 Caribbean countries and territories

Country	Legislation* (Regulation)	Provisions, exemptions, and penalties	Sanctions	Exemptions
Anguilla	Education Act	Requirement for school entry Sanctions	Denied school entry	None stated
Antigua and Barbuda	Education Act	Requirement for school entry Sanctions	Denied school entry in public schools	None stated
Aruba	No legislation			
Bahamas	The Vaccination Act	Require vaccination within 6 months after birth	Monetary fine of US$ 4	Medical exemption
Barbados	Health Services Act	Regulations include periods at which children are to be vaccinated	Monetary fine of up to $5 000 (approx. US$ 2 500) or imprisonment not exceeding 12 months	Medical and religious beliefs
Belize	Families and Children's Act; The Public Health Act	Require vaccination within 3 months of birth Requirement for school entry but not mandated by law	Monetary fine: $5 for each offense not exceeding $25 (US$ 12.50) or imprisonment for a period not exceeding 6 months Public vaccinators are liable	Medical, religious, or moral beliefs
Bermuda	Education Act	Requirement for school entry	Monetary fine or imprisonment	Medical reasons related to BCG and HIV
British Virgin Islands	Education	Requirement for school entry	No sanctions	Religious beliefs
Cayman Islands	No legislation			
Curaçao	No legislation			
Dominica	The Compulsory Vaccination Act	Require vaccination within 3 months of birth Requirement for school entry	Monetary fine of $50 (US$ 0.92) every calendar month until the child is vaccinated	Provision for medical exemption
Grenada	The Vaccination Act	Vaccination within 6 months after birth Requirement for school entry	Monetary fine of $50 (US$ 18.50)	Medical and religious beliefs
Guyana	Public Health (School Children) Immunization Act	Requirement for school entry		Religious beliefs
Jamaica	Public Health Act (Regulation under the Public Health Act – The Public Health Immunization Regulations)	Vaccinate within one year of birth Requirement for school entry May be fined up to $1 million (US$ 6 500) or face up to 1 year imprisonment	Parents/guardians, principals and heads of educational institutions, and health officials are liable, monetary fine of $1 million (US$ 6 500) or 1 year in prison	Medical only
Montserrat	Vaccination Act Public Health Act (Regulations – Infectious Diseases Prevention Regulations)	Vaccination within 3 months of birth Requirement for school entry	Monetary fine of $0.24 (US$ 0.09)	None stated, but rights of the child and religious beliefs allowed
Saint Kitts and Nevis	The Education Act	Requirement for school entry	Suspension for non-compliance	Medical only
Saint Lucia	Public Health Act (Regulations under the Public Health Act – Public Health Communicable and Notifiable Diseases Regulations)	Requirement for school entry	Monetary fine of $250 (US$ 92) or imprisonment not exceeding 3 months	Medical and religious beliefs
Saint Vincent and the Grenadines	The Immunization of Children Act	Requirement for school entry	Monetary fine or imprisonment	
Sint Maarten	No legislation			
Suriname	Education and Public Health Acts	Requirement for school entry		
Trinidad and Tobago	Public Health (Nursery Schools and Primary Schools) Immunization Act	Requirement for school entry Monetary fine	Monetary fine	Medical and religious beliefs
Turks and Caicos	No legislation			

Notes: BCG, bacillus Calmette–Guérin.
*Act of Parliament is a law or statute passed by the Parliament. A regulation under an Act details how an Act should be implemented.
Source: Prepared by the authors based on the study data.

vaccination legislation. Four countries made amendments to their legislation. The time frame for immunization varied, most did not have a stipulated national vaccination schedule, exemptions varied, sanctions were not sufficient deterrents, and fiscal support did not always complement legislative efforts. The differences in legislation may impact vaccination coverage. In the United States of America, interstate variations in immunization laws impacted vaccination coverage and exemption rates. State laws allowing both religious and philosophical exemptions and laws permitting scalable exemptions were associated with decreased MMR and DTaP coverage rates. State laws associated with policy referral to Advisory Committee on Immunization Practices guidelines for school entry had higher vaccination coverage and lower nonmedical exemption rates for MMR and DTaP vaccines (17). In the Caribbean, reintroduction of a VPD in any island could spread easily in the region due to brisk travel among the countries, and vulnerabilities due to low coverage and surveillance (10).

Countries that do not have an Act of Parliament or law specifically dealing with vaccination tend to address this issue with regulations under their Public Health Act or in their Educational Legislation. The best measure to be adopted according to legal experts is to pass a law or Act of Parliament and develop regulations under this law to assist with the implementation of the provisions of the Act. The regulations in Jamaica are extensive, but these are only regulations and are thus subject to easy removal and rewriting. An Act of Parliament is much more secure and durable.

Ideally, there should be a comprehensive legal statement of the rights of citizens to health care and detailed legislation or Act(s) of Parliament to make those guarantees real in practice. Generally, Commonwealth English-speaking Caribbean States have constitutional provisions that state the fundamental rights and freedoms of individuals in each jurisdiction. However, only Guyana states the right to health care in its constitution. Changes in the constitution require cooperation among political parties or a public referendum. Historically, to pass a vaccination law successfully, there is need for cooperation among parliamentarians, government officials, multiple disciplines, opposing political parties, and several levels of national authority (4).

The duty to immunize is universal. For example, the first statement of the Immunization Act in Jamaica declares, "It is the duty of every parent to have their child immunized." However, policies regarding school entry requirements do not generally apply to children younger than school age or explicitly ensure the vaccination of home-schooled children.

Among those reviewed from Caribbean countries, not all made allowances for medical exemptions, and few permitted exemptions based on religious or philosophical reasons, which increase the opportunities for vaccine refusal (Table 2). The allowance of NMEs introduces the risk of increasing the vulnerable, unimmunized children.

Mature vaccination programs in Australia and the United States of America that successfully utilized vaccination legislation to achieve high vaccination coverage rates and eliminate or reduce VPDs saw re-emergence in VPDs commensurate with increase in NMEs. The increased NME rates in 12 of 18 states in the United States of America were inversely associated with the measles, mumps, and rubella coverage rates among preschool-aged children (18). Government policies removing NMEs were effective at increasing vaccination coverage. In 2016, a California policy eliminated NMEs from school entry requirements, which resulted in substantial increases in vaccination coverage in 2017 compared with 2015, particularly for counties with the lowest pre-policy coverage rates (19). These legislative and policy changes should complement efforts to examine parental perceptions about vaccination and effectively communicate information regarding the risks and benefits of vaccines. Countries and territories that permit medical exemptions with variable durations support the importance of stipulating the time to renewal in the legislation.

Most countries outlined compulsory vaccines, but there was a lack of stringent enforcement measures to deter offenders. The modest fines quoted in most countries render the legislation ineffective. In The Bahamas, the penalty for a caregiver who fails to vaccinate their child is US$ 4. Few countries included criminal penalties for non-compliance ranging from 3 to 12 months of imprisonment, which may serve as deterrent, but enforcement was not confirmed. In 2017, vaccination against childhood VPDs became compulsory in Italy. This law imposed substantial monetary fines on the families of unvaccinated children when they attempted to attend primary school (20). Vaccine coverage had increased for all vaccines by 0.7%–5.2% one year later (21). Sanctions may not be necessary if public demand for vaccinations exists. Engendering a trust relationship through training of health professionals, increasing vaccine-related knowledge among providers and the public, and ensuring availability and safety of vaccines should complement legislative actions. Mandatory vaccination policies should not deprive children of the opportunity to attend school. The second strategic priority of the IA 2030 agenda encourages the engendering of public trust in vaccination in addition to political commitment (15). In the Caribbean, the importance given to education by parents helps to motivate them to have their children vaccinated, since it is a requirement for school entry. Sanctions in most legislation focused on penalties to parents of unvaccinated children and delinquent medical practitioners. The use of sanctions to enhance vaccine coverage is not helpful if sanctions are not implemented.

There were seven countries that implemented legislation prior to the EPI in 1977 (Table 1) and vaccine coverage was suboptimal. Immunization legislation by itself does not address vaccine hesitancy (22) or unstructured vaccine elimination strategies. Limited analysis suggests that legislation may have contributed to sustained and increased immunization coverage rates (Figure 1), and this is supported in mature immunization programs with legislation (3, 5, 6).

Most countries' EPI legislations do not include the right to vaccination as a public good or the responsibility of the government to ensure sustained vaccines and supplies through a dedicated budget line for immunization. The enactment of legislation without government commitment and the necessary budget to implement and sustain vaccination programs is ineffective. Effective vaccine programs in Australia and the United States of America that are associated with compulsory vaccination models included a reliable supply of safe and effective vaccines (6).

Countries such as France and Ukraine have mandatory vaccination programs, including robust monitoring and follow-up; however, both countries experienced large measles outbreaks. In these countries, vaccine hesitancy is common and contributes to low vaccination rates among children (22–23).

TABLE 3. Comparative analysis of legislation and proposed themes of model vaccine-related legislation for the Caribbean

General provision	Comparative analysis	Themes of model legislation
Legislative structure	• Some countries have Acts, whereas others have Regulations and Policies.	• Legislation as Act of Parliament.
	• Countries that do not have an Act of Parliament specifically dealing with vaccination have Regulations under Public Health Acts or Educational Legislation that refer to vaccination.	• If necessary, provide regulations under this law to assist with the implementation of the provisions contained within the Act of Parliament.
Mandatory vaccination	• All vaccination legislation provides the requirement for every parent or person having custody of a child to have that child vaccinated.	• Vaccination is a public good.
	• All stipulate vaccination should be performed before registering a child in a school.	• Every parent or guardian of every child has a duty to have their child immunized as early as possible after birth.
	• Vaccination is free in most countries.	• Children must be adequately vaccinated according to their age at entry into school/ daycare/nursery.
	• The time frame within which immunization is mandated varies from country to country, ranging from no age stipulation to 3, 6, or 12 months.	
National immunization schedule	• Among the 4 countries that included a schedule, most were limited in coverage for recently introduced vaccines, such as those for pneumococcus and human papillomavirus.	• Vaccine should be administered as early as possible after birth.
		• Make provisions to expand the schedule with additional recommended vaccines.
Sanctions	• Legislation for sanctions is present in some countries (see Table 2).	• Anyone who impedes a child from being vaccinated is liable.
	• Penalties are low, with few exceptions, and sanctions affect the parent or the health officer.	• Provisions for sanctions are necessary to increase compliance with the law.
Exemptions	• Where legislation exists, a temporary certificate of medical exemption is issued.	• Exemption from vaccination should be limited to medical reasons only.

Source: Table prepared by the authors.

Maintaining high homogeneous vaccination coverage across all districts, combined with intense surveillance and rapid outbreak response appear to be essential as well as addressing vaccine hesitancy complemented by legislation and policies (3, 22, 24, 25).

The political frameworks and legal and health systems are generally similar among the English-speaking countries, but the economic ability and performance of governments do vary (26). All countries have the capacity to support vaccination programs. The model that some but not all Caribbean countries/territories have adopted obligates the government to provide and finance vaccination and to mandate vaccination for school entry. This study identified areas where governments could update their vaccination policy and legislation in ways that could strengthen their immunization programs.

The outputs of this study are similar to the mandatory immunization legislation in other GNN countries with diversity in the number of childhood vaccines mandated, universal exemptions from mandates for medical purposes, and rare NMEs. Sanctions for failure to immunize varied, ranging from no penalty to loss of access to social services (particularly school admission), monetary fines, and incarceration (10). Further, there appears to be some variance between countries regarding how strictly immunization mandates are enforced, but this was not assessed in this study.

The study was limited with regard to the assessment of legislative implementation and compliance, the monitoring of legal requirements, the impact of sanctions and exemptions on vaccination, and legislation enacted in parent countries of Dutch- and English-speaking dependent territories. The review did not assess the implementation of regulatory oversight to ensure safe and efficacious vaccines. Although the initiation of legislation was contextualized with the EPI timeline in Table 1 and DTP3 dose in Figure 1, a detailed analysis of the impact on vaccination coverage and VPD incidence rates was beyond the scope of this review. Stipulated national vaccine schedules were identified, but a detailed analysis of schedules was not undertaken. Despite these limitations in summarizing the existing legislative frameworks and approaches to immunization in the Caribbean, the analysis provides guidance to policymakers in making effective changes to immunization legislation in their own countries.

The model legislation (Table 3) adapted components of best practices outlined in a previous review of legislation in Latin American and Caribbean countries (4). This included specifying target groups for school entry and establishing vaccination as a free public good. Other factors such as exemptions and sanctions were suggested for shaping mandatory national immunization programs among GNN countries (1). Bills for Parliament are written by each government's drafting department. Although model legislation and legislation from other countries are considered, the end product is unique to each country and will reflect its values. Thus, the model legislation presented here can only suggest the provisions that should be

considered. The exact wording can only be the government's words through its legal drafters.

In conclusion, we recommend a regulatory model that includes the following points. Vaccination should be declared a public good with the responsibility of governments to ensure ready access to essential childhood vaccines and other important vaccines across the life course. Every parent or guardian is responsible for having each child fully vaccinated according to its national schedule and prior to school entry or attendance at a daycare. Exemptions from vaccination should be limited to medical reasons only.

Mandatory childhood vaccination is an important policy intervention for governments trying to address low vaccination rates. Legislation should complement, not replace, other strategies to achieve and sustain high rates of vaccination. Unified legislative approach should be supported by government commitments to vaccine programs and complementary public health measures to improve vaccination coverage and engender vaccine confidence.

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REFERENCES

1. Harmon SHE, Faour DE, MacDonald NE, Graham JE, Steffen C, Henaff L, et al. Immunization governance: Mandatory immunization in 28 Global NITAG Network countries. Vaccine. 2020;38(46):7258–67. https://doi.org/10.1016/j.vaccine.2020.09.053
2. Gravagna K, Becker A, Valeris-Chacin R, Mohammed I, Tambe S, Awan FA, et al. Global assessment of national mandatory vaccination policies and consequences of non-compliance. Vaccine. 2020;38(49):7865–73. https://doi.org/10.1016/j.vaccine.2020.09.063
3. Vanderslott S, Marks T. Charting mandatory childhood vaccination policies worldwide. Vaccine. 2021;39(30):4054–62. https://doi.org/10.1016/j.vaccine.2021.04.065
4. Trumbo SP, Janusz CB, Jauregui B, McQuestion M, Felix G, Ruiz-Matus C, et al. Vaccination legislation in Latin America and the Caribbean. J Public Health Policy. 2013;34(1):82–99. https://doi.org/10.1057/jphp.2012.66
5. Salmon DA, Teret SP, MacIntyre CR, Salisbury D, Burgess MA, Halsey NA. Compulsory vaccination and conscientious or philosophical exemptions: past, present, and future. Lancet. 2006;367(9508):436–42. https://doi.org/10.1016/S0140-6736(06)68144-0
6. Omer SB, Betsch C, Leask J. Mandate vaccination with care. Nature. 2019;571(7766):469–72. https://doi.org/10.1038/d41586-019-02232-0
7. Lewis-Bell KN, Irons B, Ferdinand E, Jackson LL, Figueroa JP. The Expanded Program on Immunization in the English- and Dutch-speaking Caribbean (1977–2016): reasons for its success. Rev Panam Salud Publica. 2017;41:e127. https://doi.org/10.26633/RPSP.2017.127
8. Tambini G, Andrus JK, Fitzsimmons JW, Roses Periago M. Regional immunization programs as a model for strengthening cooperation among nations. Rev Panam Salud Publica. 2006;20(1):54–9. https://doi.org/10.1590/s1020-49892006000700012
9. Pan American Health Organization. Thirty-first Meeting of the Caribbean Immunization Managers, Final Report, Georgetown, Guyana 17–19 November 2015. Washington, DC: PAHO; 2016. Available from: https://www.paho.org/en/node/56334
10. Pan American Health Organization. Thirty-fifth Meeting of Managers of the Caribbean Expanded Program on Immunization, Final Report, Virtual Meeting, 3–5 November 2021. Washington, DC: PAHO; 2022. Available from: https://www.paho.org/en/node/86032
11. Ernst KC, Jacobs ET. Implications of philosophical and personal belief exemptions on re-emergence of vaccine-preventable disease: the role of spatial clustering in under-vaccination. Hum Vaccin Immunother. 2012;8(6):838–41. https://doi.org/10.4161/hv.19743
12. Caribbean Tourism Organization [Internet]. St Michael, Barbados: CTO; c2022 [cited 2022 Oct 2]. Annual Reviews and Prospects 2019. Available from: https://www.onecaribbean.org/statistics/annual-reviews-prospects/.
13. International Federation of Red Cross and Red Crescent Societies. Dutch and English Speaking Caribbean Countries IFRC Country Cluster [Internet]. [Trinidad and Tobago]: IFRC; 2021 [cited 2022 Oct 10]. Available from: https://www.ifrc.org/sites/default/files/2021-08/Dutch_English_speaking_Caribbean_Plan_2021.pdf
14. Castillo-Solorzano C, Marsigli C, Danovaro-Holliday MC, Ruiz-Matus C, Tambini G, Andrus JK. Measles and Rubella Elimination Initiatives in the Americas: Lessons Learned and Best Practices. J Infect Dis. 2011;204(suppl_1):279–83. https://doi.org/10.1093/infdis/jir216
15. World Health Organization [Internet]. Geneva: WHO; c2021 [cited 2022 Oct 10]. Immunization Agenda 2030: A Global Strategy to Leave No One Behind. Available from: https://www.who.int/teams/immunization-vaccines-and-biologicals/strategies/ia2030
16. Pan American Health Organization, Epidemiology/EPI Unit; Caribbean Epidemiology Centre. A historical review of the Expanded Program on Immunization in the English-speaking Caribbean and Suriname, 1977–1993. Port of Spain: PAHO/WHO/CAREC; 1994.
17. Shaw J, Mader EM, Bennett BE, Vernyi-Kellogg OK, Yang YT, Morley CP. Immunization Mandates, Vaccination Coverage, and Exemption Rates in the United States. Open Forum Infect Dis. 2018 Jun 2;5(6):ofy130. https://doi.org/10.1093/ofid/ofy130
18. Robbins KB, Brandling-Bennett D, Hinman AR. Low measles incidence: association with enforcement of school immunization laws. Am J Public Health. 1981;71(3):270–4. https://doi.org/10.2105/ajph.71.3.270
19. Nyathi S, Karpel HC, Sainani KL, Maldonado Y, Hotez PJ, Bendavid E, et al. The 2016 California policy to eliminate nonmedical vaccine exemptions and changes in vaccine coverage: An empirical

policy analysis. PLoS Med. 2019;16(12):e1002994. https://doi.org/10.1371/journal.pmed.1002994
20. Signorelli C, Iannazzo S, Odone A. The imperative of vaccination put into practice. Lancet Infect Dis. 2018;18(1):26–7. https://doi.org/10.1016/S1473-3099(17)30696-5
21. D'Ancona F, D'Amario C, Maraglino F, Rezza G, Iannazzo S. The law on compulsory vaccination in Italy: an update 2 years after the introduction. Euro Surveill. 2019;24(26):1900371. https://doi.org/10.2807/1560-7917.ES.2019.24.26.1900371
22. Ludvigsson JF, Loboda A. Systematic review of health and disease in Ukrainian children highlights poor child health and challenges for those treating refugees. Acta Paediatr. 2022;111(7):1341–53. https://doi.org/10.1111/apa.16370
23. Hadjipanayis A, van Esso D, Del Torso S, Dornbusch HJ, Michailidou K, Minicuci N, et al. Vaccine confidence among parents: Large scale study in eighteen European countries. Vaccine. 2020 Feb 5;38(6):1505–12. https://doi.org/10.1016/j.vaccine.2019.11.068
24. Lévy-Bruhl D, Desenclos JC, Quelet S, Bourdillon F. Extension of French vaccination mandates: from the recommendation of the Steering Committee of the Citizen Consultation on Vaccination to the law. Euro Surveill. 2018 Apr;23(17):18-00048. https://doi.org/10.2807/1560-7917.es.2018.23.17.18-00048
25. Eskola J, Duclos P, Schuster M, MacDonald NE; SAGE Working Group on Vaccine Hesitancy. How to deal with vaccine hesitancy? Vaccine. 2015 Aug 14;33(34):4215–7. https://doi.org/10.1016/j.vaccine.2015.04.043
26. Martínez R (ed.). Institutional frameworks for social policy in Latin America and the Caribbean [Internet]. ECLAC Books, No. 146 (LC/PUB.2017/14-P/Rev.1). Santiago: Economic Commission for Latin America and the Caribbean (ECLAC); 2019 [cited 2021 Oct 10]. Available from: https://repositorio.cepal.org/bitstream/handle/11362/44170/7/S1900423_en.pdf

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Revisión de los marcos legislativos sobre vacunación infantil en países de habla inglesa y neerlandesa del Caribe

RESUMEN

Objetivo. Evaluar los marcos legislativos relativos a la vacunación infantil en el Caribe de habla inglesa y neerlandesa y proponer un modelo de marco legislativo para los países del Caribe.
Métodos. En este estudio se incluyó una encuesta en 22 países y territorios del Caribe sobre los requisitos legales de vacunación para el ingreso escolar, asignaciones presupuestarias, sanciones o exenciones. Un consultor jurídico realizó una búsqueda y un análisis exhaustivos de la legislación relativa a la vacunación en 13 países y territorios del Caribe. Un análisis comparativo de la legislación dividido en cinco temas (estructura legislativa, vacunación obligatoria, calendario nacional de vacunación, sanciones y exenciones) formó la base del modelo de legislación propuesto.
Resultados. Entre los 22 países y territorios del Caribe, 17 (77%) contaban con leyes sobre vacunación obligatoria, 16 (94%) exigían la vacunación para el ingreso escolar, 8 (47%) tenían un presupuesto dedicado a los programas de vacunación y 13 (76%) no disponían de calendarios nacionales estipulados por ley. Entre las fuentes de la legislación, seis países y territorios (35%) empleaban la ley de educación, ocho (47%) la ley de salud pública y cinco (29%) una ley independiente de vacunación. Tres países y territorios —Jamaica, Montserrat y Santa Lucía— disponían de regulaciones sobre vacunación. Doce (71%) de los 17 países con legislación tenían sanciones y 10 (59%) permitían exenciones por creencias médicas o religiosas o filosóficas.
Conclusiones. Varios países del Caribe han tipificado como delito el no vacunar a un niño o niña. Al resumir los enfoques y marcos legislativos existentes para la vacunación en el Caribe, este análisis ofrece orientaciones a los responsables de formular las políticas para que realicen modificaciones efectivas en la legislación relativa a la vacunación en sus propios países.

Palabras clave Inmunización; legislación; política informada por la evidencia; toma de decisiones; política de salud; pediatría; región del Caribe.

Revisão da legislação relativa à imunização em crianças nos países do Caribe de língua inglesa e holandesa

RESUMO

Objetivo. Avaliar as estruturas da legislação relativas à vacinação em crianças no Caribe de língua inglesa e holandesa e propor um modelo de legislação para os países caribenhos.

Métodos. Este estudo incluiu uma pesquisa relativa à exigência legal em 22 países e territórios do Caribe de vacinação para admissão em escolas, alocações orçamentárias, sanções ou isenções. Um consultor jurídico realizou ampla pesquisa e análise da legislação relativa à vacinação em 13 países/territórios do Caribe. Uma análise comparativa da legislação referente a cinco temas – estrutura legislativa, vacinação obrigatória, cronograma nacional de imunização, sanções e isenções – formou a base para o modelo de legislação proposto.

Resultados. Entre os 22 países/territórios caribenhos, 17 (77%) tinham legislação que exigia a vacinação; em 16 (94%), a vacinação era obrigatória para admissão na escola; 8 (47%) tinham orçamento exclusivo para programas de imunização; e em 13 (76%), a legislação não contemplava cronogramas nacionais. Com relação à fonte da legislação, seis (35%) países usavam a legislação de educação; oito, (47%) a Legislação de Saúde Pública; e cinco (29%), legislação de vacinação independente. Três países/territórios - Jamaica, Montserrat e Santa Lúcia - tinham regulamentações para imunização. Dos 17 países com legislação, 12 (71%) incluíam sanções e 10 (59%) permitiam isenções por crenças médicas ou religiosas/filosóficas.

Conclusões. Diversos países do Caribe estabelecem que não vacinar uma criança é violação da lei. Ao resumir as estruturas de legislação existentes e as abordagens da imunização no Caribe, a análise orienta os formuladores de políticas a realizar mudanças efetivas na legislação de imunização em seus próprios países.

Palavras-chave Imunização; legislação; política informada por evidências; tomada de decisões; política de saúde; pediatria; região do Caribe.