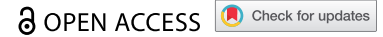


MEETING REPORT



Adult immunization practices, challenges and opportunities in Central America and the Caribbean: Advisory board proceedings

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ABSTRACT

As individuals age, they become increasingly prone to infectious diseases, many of which are vaccine-preventable diseases (VPDs). Adult immunization has become a public health priority in the modern era, yet VPDs vaccination rates for adults are low worldwide. In Central America and Caribbean, national recommendations and vaccination practices in adults differ across countries, and adult vaccination coverage data are limited. An advisory board comprised infectious disease experts, pulmonologists, geriatricians, occupational health, and public health professionals for Central America and Dominican Republic was convened to: a) describe adult immunization practices in these countries; b) discuss challenges and barriers to adult vaccination; and c) find strategies to increase awareness about VPDs. The advisory board discussions reflect that national immunization guidelines typically do not include routine vaccine recommendations for all adults, but rather focus on those with risk factors. This is the case for influenza, pneumococcal, and hepatitis B immunizations. Overall, knowledge lacks about the VPD burden among health-care professionals and the general public. Even more, there is insufficient information on vaccinology for students in medical schools. Actions from the responsible authorities – medical schools and scientific societies which can advocate for vaccination and a better knowledge in vaccinology – can help address these issues. A preventive medicine culture in the workplace may contribute to the advancement of public opinion on vaccination. Promoting vaccine education and research could be facilitated via working groups formed by disease experts, public and private sectors, and supranational authorities, in an ethical and transparent manner.

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Introduction

A demographic transition has been recorded worldwide including Latin America and the Caribbean.¹ According to the Latin American and Caribbean Demographic Center, the population aging intensifies due to the combination of sustained mortality decrease and a rapid decline in fertility.² It is expected that by 2050, the proportion and absolute number of adults above the age of 65 will exceed the population of children under the age of 15.² Life expectancy at birth continues to rise and is projected to increase from 75.2 years in 2015–2020 to 79.7 years in 2040–2045, for both sexes.³

As the population ages, the burden of vaccine-preventable diseases (VPDs) shifts to adults and older adult population groups.⁴ Because of co-morbidities, and immunosenescence, with age, people become increasingly vulnerable to infectious illnesses, many of which are VPDs.^{5,6} Moreover, infectious diseases further augment adults' risk of chronic diseases, mortality, and disability.^{7–11} In addition to the disease burden, VPDs impose a considerable economic cost. In the United States in 2013, the

yearly economic burden related to the four primary VPDs among persons aged 50 years and older, namely influenza, pneumococcal illness, herpes zoster, and pertussis, was \$26.5 billion.¹² This cost is predicted to rise substantially during the next 30 years as a result of population growth and changes in age distribution.¹³ Unvaccinated individuals accounted for 80% of the overall economic burden produced by VPDs in adults aged 19 and older, according to another economic cost model.¹⁴ On the contrary, higher vaccination coverage is associated with a considerable reduction in adult illnesses and billions in cost savings associated with avoided disease.¹⁵

Nonetheless, unlike childhood immunization, adult vaccination was not a health priority for the public or health authorities for decades.^{7,16,17} Adult vaccination rates are low worldwide due to a lack of vaccination recommendations, reimbursement and infrastructural constraints, vaccine hesitancy, and a lack of knowledge and education about the benefits of vaccination.^{5–16–19}

The World Health Organization (WHO) has considered, more than a decade ago, that the increased risks from VPDs

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along with the benefits of preventive illness in older individuals both necessitate a “life-course approach” and the development of a corresponding vaccination schedule that would involve adults.^{5,7} However, a recent study of health systems in 194 WHO member states revealed a dearth of adult vaccination programs in 38% of countries.²⁰ In the Americas WHO region, 91.4% of countries (32) reported influenza immunization programs, 88.6% (31) hepatitis B immunization, 31.4% (11) pneumococcal polysaccharide immunization, 11.4% (4) herpes zoster immunization, and 5.7% (2) pneumococcal conjugate immunization.²⁰ There is a scarcity of data on adult vaccine coverage in the region, with existing evidence showing substantial variability among regions.²¹ According to the latest Pan American Health Organization (PAHO) data regarding adult vaccine coverage, the 2018 influenza vaccine coverage among adults varied from 32% in Uruguay, or 34% in Paraguay to 100% in Ecuador, Panama, and Argentina, while data were not available from most countries in the Central America and Caribbean region.²¹ A variety of factors contribute to low vaccine coverage: supply and access issues, lack of knowledge on adult vaccination guidelines by the public and health-care professionals (HCP) —including vaccines HCP themselves should receive—, and regulators’ lack of understanding of the associated disease and cost burden.^{22,23}

In the current era, adult immunization has become a priority for public health.²⁴ A coordinated effort among all stakeholders is required to implement a “life-course approach” to immunization and strengthen vaccination policies involving adults.^{5,7,24} In the Immunization Agenda 2030, the WHO acknowledges as strategic priority the life-course immunization goal,²⁵ a priority that has been dramatically highlighted by the Coronavirus Disease 2019 (COVID-19) pandemic impact on unvaccinated adults.^{26,27} Following the COVID-19, it is vital to extensively communicate the need for adult vaccinations besides COVID-19 vaccine and to establish strategies to address the associated barriers.^{19,28,29}

An Advisory Board was organized to discuss current situation and recommendations related to adult vaccination in the Central America and the Caribbean region. The objectives of the meeting were to:

- Describe current adult immunization practices in participating countries.
- Discuss the challenges and the barriers for adult vaccination in these countries.
- To find strategies to increase awareness of VPDs and adult vaccination among population, HCPs, and health authorities.

A lay summary of the study context, objectives and main findings can be found in [Figure 1](#).

Methods

Meeting setting

The Advisory Board meeting was virtually held on 9 December 2021. Eight experts ([Table 1](#)) on infectious diseases, pulmonology, geriatrics, occupational health, and public

health from Costa Rica, El Salvador, Guatemala, Panama, and Dominican Republic participated to the meeting. Medical and epidemiology experts from GSK facilitated the meeting organization and execution ([Table 1](#)).

Guiding questions

The meeting was organized based on a predetermined agenda. Each expert made a presentation covering the following guiding questions:

- (I) In your practice, what is your knowledge or your perception of the burden of adult diseases such as pneumococcus, influenza, pertussis, and herpes zoster?
 - What are the challenges in the current surveillance for adult diseases and how can it be improved?
 - What type of adult vaccines and VPDs do you observe the most in your daily practice?
- (II) Review the national immunization programs (NIP) for adult vaccination in your country. How do you think the respective vaccination calendar should be improved?
 - Are there some differences among recommendations from public and private sector?
- (III) Describe the challenges and barriers for adult vaccination in your country:
 - Infrastructure
 - Perception of disease risk in patients with comorbidities
 - Underreporting or misdiagnosis of adult diseases
- (IV) What do you think are the best approaches and strategies to increase adult disease awareness and vaccination in the general public and among HCPs? How could these be implemented and who should be involved?
- (V) The role of scientific societies:
 - Do you think scientific societies may influence the national recommendation in your country?
 - Which of them could be the biggest influencer?

Findings

Current adult immunization practices

National immunization programs

The NIPs in each of the participating countries contain some recommendations for adults ([Table 2](#)). These recommendations typically only involve influenza, tetanus-diphtheria-pertussis, pneumococcal, and hepatitis B vaccinations and they are not recommended for all individuals, but rather for those who have risk factors, such as chronic medical conditions ([Table 2](#)).^{30–37–39}

Some considerations were expressed by the experts. In Costa Rica, the social security covers 90% of the population⁴⁰ and the vaccine coverage is around 90% for tetanus and diphtheria (Td), pneumococcal, tetanus, diphtheria & acellular pertussis (Tdap) and influenza vaccines.⁴¹ However, in 2021, the goal of 80% seasonal influenza vaccine coverage for all adults over 58 years of

PLAIN LANGUAGE SUMMARY



What is the context?

- ◆ Adult vaccination has received little attention over the past decades. Hence, vaccination rates are low worldwide.
- ◆ In the Latin American and Caribbean area, national recommendations for adult vaccination vary across countries. Adult vaccination coverage data are limited.
- ◆ An advisory board with health experts from Costa Rica, Dominican Republic, El Salvador, Guatemala and Panama was held to:
 - describe adult vaccination practices,
 - discuss barriers to adult vaccination,
 - find strategies to increase awareness about vaccine-preventable diseases.



What is the impact?

The advisory board discussions reflect that:

- ◆ Vaccination recommendations exist in most countries for hepatitis B, seasonal influenza, pneumococcal disease, tetanus & diphtheria and tetanus, diphtheria & acellular pertussis vaccines.
- ◆ However, these recommendations do not include all adults. Instead, recommendations focus on adults with risk factors.
- ◆ Healthcare professionals
- ◆ Public lack information on vaccine-preventable diseases.
- ◆ Students in medical schools have limited education on vaccines and vaccinology.



What is new?

- ◆ Adult vaccination can be promoted by:
 - Improving existing disease surveillance systems
 - Including recommendations in all national immunization programs
 - Including a good vaccinology teaching program in medicine schools
 - Providing guidelines in a chart format for healthcare providers
 - Improving the health culture with vaccinations held in the workplace
 - Improving compliance with innovative reminder systems
- ◆ To achieve these goals, national health authorities, governments, public and private sectors need to work together

Figure 1. Plain language summary.

age was not reached. In Dominican Republic, influenza and pneumococcal vaccines are only for children and adult >65y with some special conditions. In the private market, HCPs follow CDC recommendations.

In El Salvador, NIP is focused on children under the age of five and individuals over the age of 60. However, even though pneumococcal vaccine is offered for all population at risk (Table 2), there is not always availability for 13-valent pneumococcal conjugate vaccine (PCV-13) for that population. Tdap and influenza vaccines are recommended to pregnant

women. Influenza and pneumococcal vaccinations are being administered in the private sector, mostly to people with chronic respiratory diseases or other risk factors.

In Guatemala, pregnant women receive the influenza and Tdap vaccines. The Ministry of Health and Social Security recommends vaccination against influenza and pneumococcus for high-risk adults above the age of 65. There are recommendations for available vaccines included in NIP for all targeted people under Social Security system. The Labor association conducts annual influenza vaccination campaigns and educate

Table 1. Advisory board meeting participants.

Name, country	Area of specialty	Current affiliation
Fernando Coto, Costa Rica	Gerontology	Professor at the School of Medicine and the postgraduate School of Geriatrics and Gerontology at the University of Costa Rica
Carlos Rodríguez, Dominican Republic	Adult infectious diseases	<ul style="list-style-type: none"> • Past president of the Dominican Society of Infectology and the Central American and Caribbean Association of Infectology • Professor of the infectology program • Clinical researcher
Jorge Ramírez, El Salvador	Internal medicine, pulmonology	<ul style="list-style-type: none"> • Past president of the Salvadoran Association of Pneumology • Head of the Department of Research and Teaching in Internal Medicine and Pneumology • Head of Chair of Pneumology of the Faculty of Medicine of El Salvador
Telma Hernández, Guatemala	Clinical pharmacology/Occupational health and safety	<ul style="list-style-type: none"> • President of the Association of Labor Medicine of Guatemala • Professor in the Family Medicine Master's program. Galileo University
Nancy Sandoval, Guatemala	Internal medicine and infectious diseases	<ul style="list-style-type: none"> • President of the Guatemalan Association of Infectious Diseases • Professor of internal medicine at the Rafael Landívar University
Itza Barahona, Panama	Preventive medicine and public health	<ul style="list-style-type: none"> • Public health doctor • Past Public Health Director of the Ministry of Health of Panama
Reynaldo Chandler, Panama	Pulmonology	<ul style="list-style-type: none"> • Professor of pulmonology of the Inter-American University of Panama • Clinical researcher
Ana Belén Araúz, Panama	Infectious diseases and internal medicine	<ul style="list-style-type: none"> • Past president of the Society of Infectious Diseases of Panama • Clinical researcher
Laura Naranjo	Pediatric infectious diseases Vaccines	<ul style="list-style-type: none"> • Vaccines Medical Manager, GSK Advisory board meeting role: chair Investigator of SNI – Senacyt – Panama
Elidia Domínguez	Pediatric vaccines	<ul style="list-style-type: none"> • Vaccines Medical Manager, GSK Advisory board meeting role: co-chair
Adriana Guzman Holst	Epidemiology	<ul style="list-style-type: none"> • Regional Director of Epidemiology, GSK Advisory board meeting role: presenting adults VPDs epidemiology data
Ingrid Leal	Vaccines	Lead Publications manager
Maria Mercedes Castrejón	Pediatric infectious diseases	<ul style="list-style-type: none"> • Scientific Affairs and Public Health Director, GSK Advisory board meeting role: presenting adult NIPs and vaccine coverage evidence
Andrea Castrellon	Medical Coordinator	<ul style="list-style-type: none"> • Medical Affairs Coordinator, GSK Advisory board meeting role: Logistic & technical support

Abbreviations: NIP, national immunization program; VPD, vaccine-preventable disease.

Table 2. Recommendation for adults' vaccination included in the national immunization programs, per country.

Country	Hepatitis B	Influenza, seasonal	Pneumococcal	Tdap/Td	Other
Dominican Republic ³⁰	<ul style="list-style-type: none"> • All adults in risk groups^a 	<ul style="list-style-type: none"> • ≥65 y • All adults in high-risk groups 		<i>Tdap</i> : pregnant women at 27 week [Pilot in three country regions] <i>Td</i> : <ul style="list-style-type: none"> • Every 10 y • Female of childbearing potential aged 10–39 y 	<i>Yellow fever</i> : <ul style="list-style-type: none"> • Adults ≤59 y • Travelers to/from endemic countries
Costa Rica ^{31,32}	<ul style="list-style-type: none"> • All adults in risk groups 	<ul style="list-style-type: none"> • ≥58 y • Pregnant women • Health-care workers 	<ul style="list-style-type: none"> • ≥65 y • All adults in high-risk groups 	<i>Tdap</i> : pregnant women at 3 rd trimester <i>Td</i> : every 10 y	
El Salvador ^{33,34}	<ul style="list-style-type: none"> • Risk groups • Patients with chronic conditions • Health-care workers 	<ul style="list-style-type: none"> • >60 y • Adults in risk groups^b 	<ul style="list-style-type: none"> • >60 y • Adults in risk groups • Patients with chronic conditions 	<i>Tdap</i> : <ul style="list-style-type: none"> • Pregnant women at 20 week <i>Td</i> : <ul style="list-style-type: none"> • Pregnant women at 16 weeks • All population, every 10 y 	
Guatemala ^{35,36}	<ul style="list-style-type: none"> • Risk groups • Health-care workers 	<ul style="list-style-type: none"> • ≥60 y • All adults in high-risk groups^b • Residents in long-term care facilities 		<i>Tdap & Td</i> : <ul style="list-style-type: none"> • Pregnant women • Health-care workers 	<i>Yellow fever</i> : risk groups ≤59 y
Panama ^{37,38}	<ul style="list-style-type: none"> • All adults in risk groups • Health-care workers 	<ul style="list-style-type: none"> • ≥60 y • All adults in high-risk groups^b • Residents in long-term care facilities 	<ul style="list-style-type: none"> • >60 y • Risk groups 	<i>Tdap</i> : <ul style="list-style-type: none"> • Adults >60 y • Risk groups • Pregnant women <i>Td</i> : <ul style="list-style-type: none"> • Female of childbearing potential • All age groups 	Measles and rubella: <ul style="list-style-type: none"> • Adults ≥19 y • Postpartum • General population not previously vaccinated with

Abbreviations: Td, tetanus & diphtheria vaccine; Tdap, tetanus, diphtheria & acellular pertussis vaccine; y, year(s).

^aSource, NIP 2008:³⁸ healthcare workers, people with kidney problems who need dialysis, people in need of regular blood transfusions, people living in prisons, asylums.
^bSource, WHO (2020):^{32–36} includes healthcare workers, pregnant women, patients with chronic conditions.

employees about VPDs and their economic impact in the workplace.

Panama has one of Latin America's best immunization programs (Table 2), Meningococcal vaccine is available in the National Immunization Program for high-risk groups and for outbreak's containment. This vaccine is also available in the private health-care sector.

According to Ministry of Health in Panama, adult vaccination programs are split into two categories: one for adults aged 20–59 years and another for seniors aged 60 years and above.³⁸ In 2020, vaccine coverage in older adults (>60 years) was 99% for influenza and 88% for pneumococcal vaccines (21 June 2022, instant message from Panama EPI Head MINSA to Dr. Itza Barahona de Mosca).

Additionally, the Panamanian NIP addresses the need to minimize the number of missed opportunities to vaccinate by supporting the simultaneous administration of more than one type of vaccine. However, some factors (dress style, transportation, business hour, wait time) can negatively influence the opportunities for getting vaccination. Additionally, pursuant to a 2007 law, all universities should require students to provide proof of immunization status. The private health sector adheres to the recommendations of the Ministry of Health but there are no specific facilities to vaccinate adults.

The role of scientific societies

In Costa Rica, scientific societies are actively involved in raising public awareness, and the Societies of Infectious Diseases, Immunology, Internal Medicine, and Pneumology may collaborate on developing recommendations. Similarly, in the Dominican Republic, alike scientific associations may offer guidance on adult vaccination although they do not currently provide any relevant recommendations. Scientific societies provide Continuing Medical Education seminars in El Salvador that include immunization-related topics.

In Guatemala, Internal medicine, Infectious disease, Labor medicine, and Geriatric Medical Associations all promote vaccination recommendations. Similarly, Panama's pertinent scientific societies collaborate to provide recommendations. Certain disciplines involved in primary care (public health, family medicine, pediatrics, geriatrics, internal medicine, and labor medicine) can readily promote vaccination advocacy. Obstetrician and Gynecology society gives guidelines regarding vaccines recommendation in pregnant women.⁴² "Ciencia en Panama"⁴³ is an organization of scientists working to promote and disseminate science versus anti-science.

With the exception of the Dominican Republic, all other Advisory Board countries have their own National Immunization Technical Advisory Groups (NITAG), which include representative members of local scientific societies. These NITAGs are members of the global NITAG network.⁴⁴

Barriers and challenges for adult vaccination

The first cluster of adult vaccination barriers consists of those imposed by a lack of governmental and administrative requirements addressing adult immunizations (Table 3). They include pertinent laws, a lack of social security reimbursement, lack of appropriate structure and logistics for organizing adult

vaccination: there are not enough health-care facilities in remote and rural areas capable of administering immunizations.

Another cluster pertains to the attitudes and practices of HCPs about adult vaccines (Table 3). HCPs frequently have poor beliefs on the importance of adult immunizations, miss chances to vaccinate adults, and frequently fail to identify VPDs. They also underreport cases, adding to the general misconception about VPD prevalence among adults.

The final cluster of barriers involves the general public, that does not have a culture for primary care. Adults seldom seek prompt medical attention for any ailment, and they generally do not have a family doctor or a general practitioner consultant. The general public has a poor knowledge of disease burden, limited access to credible information, and is vaccine hesitant. Furthermore, those who want to get vaccinated may face transportation issues, and insurance companies often do not cover immunizations in adults. Under these conditions, anti-vaxxers gain a presence in social media disseminating misinformation and false messages.

Disease burden perception

Some consistent findings across all countries were the lack of adequate adult VPD surveillance systems (Table 3), and the few available reports on mortality and morbidities related to adult VPDs in the region. There is also limited access and low interest for healthcare and vaccination, even with the short adult vaccination schedules that are available in almost all participating countries. On the other hand, the pandemic of COVID-19 has shifted the public opinion in favor of adult immunization by raising awareness among the public and HCPs about the need of adult vaccination.

Costa Rica. The most common infectious diseases among adults in Costa Rica are pneumococcal disease and influenza, followed by herpes zoster mainly in people >80 years old. Pertussis is not included in the differential diagnosis for routine clinical examination in adults, and respective diagnostic tests can be performed solely on the basis of a clinician's suspicion. The symptoms of chronic and infectious diseases in older adults might differ from the classic description, then there are under recognition, delay and inaccurate diagnosis with a worse prognosis.

Dominican Republic. In Dominican Republic, there are limited data of infectious diseases burden in adults due to poor availability of diagnosis test in public sector. The most common diseases in this population are pneumococcal disease, influenza, herpes zoster, hepatitis B, and hepatitis A. Pertussis is not diagnosed in the public setting due to the cost of respiratory panel tests, in contrast to private sector. Knowing VPDs burden is important due to the cost they represent, and this was demonstrated in a study performed by Dr. Rodriguez's group,⁴⁵ showing that treating bacterial pneumonia introduces a substantial economic burden on the healthcare system. The estimated direct medical cost in average was US\$ 84,06 for outpatient care, US\$ 550,74 for hospital attention, US\$ 955,68 for intensive care unit (ICU) attention, and around US\$ 4,000 for patients with invasive pneumonia or sepsis.⁴⁵

Table 3. Main findings by thematic category.

Current adult immunization practices	
<p>NIP</p> <ul style="list-style-type: none"> • In most countries, Influenza and pneumococcal vaccination applied in adults >65 y with some special conditions • Pertussis and hepatitis B vaccines applied only for pregnant women 	<p>Scientific societies</p> <ul style="list-style-type: none"> • Infectious Diseases, Immunology, Internal Medicine, Pneumology Labor Medicine, and Geriatrics medical associations generally promote vaccination awareness among the public in all countries • Some involvement in advising immunization recommendations • Some involvement in relevant Continuous Medical Education, in collaboration with public and private health sectors
Barriers & challenges	
<p>Disease burden perceptions</p> <ul style="list-style-type: none"> • Lack of data in the surveillance system • Diagnostic tests are limited or unavailable in the public health sector • Pneumococcal disease and Influenza are the main diseases recognized <p>Public Health</p> <ul style="list-style-type: none"> • Lack of vaccination-related legislation • Vaccination card available only for children • Lack of appropriate structure and logistics for organizing adult vaccination • Limited human and material resources • Insurance companies usually do not cover vaccines in adults 	<p>HCPs</p> <ul style="list-style-type: none"> • Low perception of the needs for vaccination and risk factors in adults • Poor vaccinology information during the medical career • Underreporting of vaccine-preventable diseases • Missed diagnoses and underreporting cases creating a false perception on the presence of the diseases • Missing opportunities to vaccinate <p>General public</p> <ul style="list-style-type: none"> • There is no culture of primary care and disease prevention • Low perception of the needs for vaccination and risks of VPDs in adults • Vaccine hesitancy • Anti-vaxxers expanding space in social networks spreading misinformation • Limited access to credible information
Suggested strategies	
<p>Public Health</p> <ul style="list-style-type: none"> • Incorporate vaccines into the NIP • Improve surveillance system, cases notification & register • Facilitate diagnosis – improve the access to diagnosis tests • Strengthen disease preventive programs and involve primary care • Facilitate vaccine access • Health economic studies • More participation from the relevant supranational organizations • Alliance between competent authorities, scientific societies, and private sector, advocating adults' vaccination. • Create working groups to establish guidelines and strategies for adult vaccination 	<p>HCPs</p> <ul style="list-style-type: none"> • Promote Continuous Medical Education in vaccinology • Provision of a simplified format of the immunization guidelines, for daily use in the clinical practice • Health economic and other epidemiology studies on respiratory diseases and VPDs • Minimization of lost opportunities to vaccinate <p>General public</p> <ul style="list-style-type: none"> • Increase awareness on preventive care including adult vaccination • Give access to credible information • Involve sociologists, HCPs, academics, scientists, public health authorities, researchers, religion leaders, influencers to deliver information on the benefits of disease prevention, including immunization • Use key messages, plain language, infographics, and animations, to disseminate evidence in what the vaccines do • Adapt innovative technologies to improve vaccination cards

Abbreviations: HCPs, healthcare professionals; NIP, national immunization program; VPDs, vaccine-preventable diseases; y, year(s).

El Salvador. In El Salvador, the reporting of respiratory illness cases is inaccurate, and the definition of cases within the surveillance system is not explicit, since it encompasses a broad range of respiratory syndromes. Respiratory infection tests are only available in restricted quantities in the public sector, and they are primarily utilized to diagnose influenza. Herpes zoster is more likely to be diagnosed in adults with underlying medical conditions.

Public awareness of infectious diseases is low, and people often confuse their symptoms with those of a common cold. This makes them only seek medical help when their symptoms become more severe.

Guatemala. There is no active national epidemiologic surveillance in Guatemala, nor a requirement for mandatory reporting of several vaccine-preventable diseases (i.e influenza, pneumococcus, herpes zoster), and microbiological diagnosis is not commonly conducted. Before the COVID-19 pandemic, pneumonia was the second most frequently diagnosed infectious disease among patients in internal medicine service of Hospital Roosevelt.⁴⁶ In contrast, during the pandemic era, pneumonia was in the sixth place. Respiratory Syncytial Virus (RSV) and influenza virus were also detected at that time. Pertussis is perceived as an illness that affects exclusively children and is unrecognized in

adults, whereas herpes zoster is perceived as a disease associated with stress in the labor setting. Post herpetic neuralgia is a diagnosis in outpatients and influenza vaccination campaigns are taking place in the workplaces.⁴⁷

Panama. Overall, microbiological detection of infectious lung diseases is quite poor in Panama. Multiplex testing is expensive, making it difficult to diagnose infectious illnesses in the public health sector. This suggests that there are more cases that are not reported. As a result, only a few sentinel surveillance data give any epidemiological information on adult respiratory infections. It is noteworthy that among the first five causes of death in 2018 in the country, “Pneumonia” is observed as the second cause of death only in Comarca Kuna, with a rate of 33.2 per 100,000 inhabitants. This finding calls for a comprehensive analysis due to disparities in the country.⁴⁸

Adults do not seek for preventive health-care attention frequently. In 2019, 13.7% of adults between 20 and 59 y and 15% of adults >60 y sought for preventive health-care attention.⁴⁹

Pertussis is not promptly recognized, and availability to diagnostic tests is restricted. Cases are rarely reported, but some outbreaks have occurred in indigenous communities. Herpes zoster is mainly reported among outpatient with the human immunodeficiency virus, and may go unreported in other settings.

Nonetheless, the geriatric population has a good awareness of pneumococcal disease and influenza, the two most common diseases afflicting this age group. Influenza awareness is high, due to effective yearly influenza vaccination efforts and the widespread availability of diagnostic testing.

Discussion

The Advisory Board experts identified low perception among HCPs and general public of the needs for vaccination and of the risk factors of VPDs in adults. Furthermore, there is a shortage of relevant provisions within the applicable Public Health legislation. Disease surveillance is inadequate, concealing the associated disease burden.

Future directions and related recommendations were made by the experts based on the discussed findings. These could be grouped in the same three clusters respective to the barriers and challenges (Table 3).

Strategies to increase adult disease awareness and vaccination

Public health

At the regulatory and administrative level of public health in the region, provisions should be established to promote adult vaccinations (Table 3). The first step is to emphasize the importance of adult immunization by including such recommendations in all NIPs. Second, the surveillance system should be modified to ensure the collection of reliable epidemiological data. The case notification network could be redesigned appropriately, and representatives from a variety of medical disciplines should be included in the case notification network to facilitate surveillance. Vaccine access must be improved, while also taking into account financial considerations. To contribute information on the economic impact of VPDs, health economic studies are necessary.

All experts agreed that after the significant impact of the COVID-19 pandemic on adult morbidity and mortality, there is a need to reinforce primary care and develop adult vaccination programs considering also the vaccination in the workplace, which is compatible with the WHO Immunization Agenda 2030 and makes it highly relevant.^{25,50}

National competent authorities could enhance their involvement in supranational organizations that develop policies impacting Latin America and the Caribbean.^{44,51} They could form working groups to develop immunization recommendations for adults in the region (Table 3).

HCPs

Continuous Medical Education would help keep HCPs up-to-date on the available evidence regarding VPDs in adults, advances in vaccine development, the relevance of incorporating vaccination into primary care systems, and the need to adequately monitor disease occurrence through a competent surveillance system.²²⁻⁵²⁻⁵³⁵⁴ It is critical to align physicians, nurses, and other HCPs, on immunization criteria in order to maximize vaccination possibilities and minimize missed opportunities to vaccinate. In this way, Strategic Objective 3 of the Global Vaccine Action Plan (GVAP) calls for the benefits

of immunization to be distributed equitably to all people. The PAHO wishes to make a standardized methodology to evaluate missed opportunities for vaccination, to improve vaccination services and to increase demand for vaccines.⁵⁵ According to the discussion among experts, this might be aided by providing HCPs with vaccination guidelines in a chart format for use in routine clinical practice. It would likely be helpful to divide recommendations into groups ranging from younger to older adults, as well as by underlying conditions. This is because older adults are diverse, and their symptoms of chronic and infectious illnesses may differ from the standard description, resulting in delayed or inaccurate diagnosis and a poor prognosis.

General public

Several publications coincide with the experts in that a vaccination campaign or education and health promotion programs supported by recognized and respected sources – community leaders, doctors, scientists academics, public health authorities, researchers, and influencers in the countries – would be an effective strategy for reaching the adult population, and might contribute to increased public awareness of VPDs in adults.^{18,22,29} Simultaneously, authorities might leverage social media channels to aggressively spread trustworthy information in response to anti-vaxxers' disinformation.²²⁻⁵⁶⁻⁵⁸ The efficacy and safety of vaccines should be communicated in plain language, with crucial points contained inside infographics or animations.⁵⁷⁻⁶⁰

To encourage individuals to adhere to vaccination regimens, reminders are helpful.⁶¹ Enhanced vaccination cards with reminders or smartphone applications could be developed as innovative strategies to help individuals adhere to schedules.

Conclusions

In the countries represented in this Advisory Board, there is a significant lack of accessible evidence about VPDs. This parallels a significant awareness gap about the burden induced by VPDs, both among the adult population and HCPs. These unmet demands can be addressed by appropriate measures on the part of competent authorities and scientific societies, both of which can play a significant role in vaccine advocacy, including through a good vaccinology teaching program in medicine schools. A preventive medicine culture fostered in the workplace might aid in advancing public attitudes about vaccination. Each country's experts might form working groups with the public and private sectors and the supranational authorities, to promote vaccination education for HCPs and the general adult population, and to conduct studies on VPDs, including health economics studies. This will help increase the knowledge of vaccines and vaccination.

Abbreviations

AdBoard	Advisory Board
COVID-19	Coronavirus Disease 2019
HCPs	healthcare professionals
NIP	national immunization program
VPDs	vaccine-preventable diseases
WHO	World Health Organization
PAHO	Pan American Health Organization

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Author contributions

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