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Short communication

# The adoption of the HPV vaccine school-entry requirement in Puerto Rico: How practical lessons can inform future vaccine policies

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ABSTRACT

Vaccine requirements are policy-level strategies used to improve population health outcomes; however, discourse politicization of vaccines may hinder adoption and implementation. An example of the complexities related to adoption of vaccine policies in the United States (US) is the human papillomavirus (HPV) vaccine school-entry requirement. In 2018, Puerto Rico's (PR) Department of Health adopted this policy. This study assessed stakeholders' recommendations for adoption of the HPV vaccine school-entry requirement that could inform future vaccine policies. Stakeholders (e.g., researchers, members of medical and non-profit organizations) were interviewed from May to August 2018. Participants (n = 20) discussed recommendations for public health professionals interested in adopting such policy. Data were analyzed using applied thematic techniques. Participants emphasized the importance of raising HPV vaccine awareness and providing education prior to the requirement. They recommended using real stories and making the problem relevant by using local data. Participants recommended considering the local culture and government bureaucracies, and promoting multisectoral collaborations to combine limited resources. The combination of education efforts, local data, and multisectoral collaborations facilitated the adoption of the HPV vaccine school-entry requirement in PR. Findings highlight the need to understand the contextual distinctions of the communities where vaccination requirements may be adopted and implemented to anticipate barriers and leverage existing resources. Consideration of the politico-cultural context may be important as political beliefs have become entrenched with vaccine policy. These practical lessons can inform public health professionals and policymakers who are seeking to adopt and implement vaccine policies in other settings to ensure equitable vaccine access.

## 1. Introduction

Policies can contribute to improving population health outcomes by addressing the social determinants of health at multiple levels. For instance, vaccine requirements have been successful at increasing vaccination rates (Dempsey and Schaffer, 2011). Nevertheless, the current politicization of discourse around the COVID-19 vaccine has altered the way in which the public sees these policies (Sharfstein et al., 2021), potentially hindering the implementation of current, and the adoption and implementation of future, vaccine requirements.

An example of the complexities related to the adoption and implementation of vaccine policies in the United States (US) is the human papillomavirus (HPV) vaccine school-entry requirement. The HPV vaccine has proven to be a safe and effective tool to prevent HPV-related cancers (e.g., cervical, vulvar, anal, penile, oropharyngeal); yet, in 2020, only about 59 % of adolescents were up-to-date in receiving their vaccination series (Pingali et al., 2021). Factors such as vaccine hesitancy caused by myths and misinformation surrounding the HPV vaccine (Rositch et al., 2022), lack of strong provider recommendation (Healy et al., 2022), and an absence of political will (Abiola et al., 2013; Barraza et al., 2016) have resulted, in part, in a limited number of states/territories (i.e., Virginia, Rhode Island, Washington DC, Puerto Rico, and Hawaii) adopting HPV vaccine school-entry requirements (Barraza et al., 2016; Colón-López et al., 2021b; State of Hawaii Department of Health, 2020; Vázquez-Otero et al., 2021a).

In part due to Puerto Rico (PR) having high HPV vaccination rates, in June 2017, PR's Department of Health (DOH) announced that the HPV vaccine would be added to the list of school-entry required vaccines for

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fall 2018 (Colón-López et al., 2021b; Vázquez-Otero et al., 2021a). Subsequently, in May 2018, the DOH formally announced that the HPV vaccine would be required for 11 to 12-year-old children starting during the 2018–2019 academic year (Colón-López et al., 2021b; Vázquez-Otero et al., 2021a). As established by PR's Immunization Law of 1983, only medical or religious exemptions are permitted. Similar to other vaccine school-entry requirements, not having the required vaccines would ultimately result in children not been permitted to attend school ("Ley de Inmunizacion," 1983). For the 2019–2020 academic year, the requirement was expanded to include adolescents up to 14 years old (Colón-López et al., 2021b).

The adoption of this policy was influenced by stakeholders from medical professional organizations, academia, government staff, non-profit organizations, and the members of the private sector (Vázquez-Otero et al., 2021a). This brief report presents PR stakeholders' recommendations for the adoption of the HPV vaccine school-entry requirement that could inform future vaccine policies.

## 2. Methods

The data presented here are part of a larger two-phase study (i.e., interviews with stakeholders and content analysis of newspaper media) that used Kingdon's multiple streams framework (MSF) (Kingdon, 1995) to consider the sociopolitical factors that influenced the adoption of PR's HPV vaccine school-entry requirement (Vázquez-Otero et al., 2021a; Vázquez-Otero et al., 2021b). Interviews with stakeholders from PR were conducted from May to August 2018. Participants included policymakers, researchers, government employees (i.e., from the DOH), leaders and members of medical (e.g., pediatric) and dental associations and non-profit organizations (e.g., vaccination coalitions, public corporations), and individuals from the private sector (e.g., physicians and pharmaceutical representatives). These participants described themselves as being in favor of the HPV vaccine school-entry requirement (n = 20). The interview guide, adapted from Abiola et al. (2013), was translated to Spanish. Topics covered in the guide included the constructs from MSF (i.e., problems, politics, and policy). Additionally, one question asked participants about their recommendations for other public health professionals interested in adopting an HPV vaccine school-entry requirement, which is the focus of this report.

Interviews were transcribed and imported to MaxQDA. As part of the analysis process, a second coder (EL) was trained, a final kappa of 0.89 was achieved with four interviews, and the remaining interviews were coded by one researcher (CVO). Data were analyzed in Spanish using applied thematic techniques (Guest et al., 2012). Themes were summarized and exemplary quotes were translated. All materials and methods were approved by the University of South Florida Institutional Review Board.

## 3. Results

Three overarching themes were identified as part of the recommendations provided by the stakeholders. Exemplary quotes are included in Table 1.

### 3.1. Raise HPV vaccine awareness and provide education

Participants recommended raising HPV vaccine awareness and providing education to the public, including policymakers and government staff, prior to adopting and implementing the HPV vaccine school-entry requirement. The information provided must be evidence-based but also should be relatable. By educating the public, the stakeholders aimed to increase HPV vaccine knowledge, frame the message as cancer prevention, and reduce the potential resistance from the anti-vaccine sector.

**Table 1**
Exemplary Quotes from Stakeholders by Theme.

| Theme | Quote |
|---|---|
| Raise HPV vaccine awareness and provide education | If parents are not educated, there is going to be resistance. If health professionals, physicians and nurses are not well educated in what they have to say; when the patient asks, there is going to be resistance. – pediatrician |
| | The most important thing is to continue educating, to educate, educate, educate, educate, educate, and try to counteract any entity or person who says otherwise, and [to educate] with the proven and scientifically based facts. – member non-profit organization |
| Humanize and contextualize the problem | Rhaiza. She put a face to the problem, and basically it is about awareness, it helped with those people who thought 'That is not going to happen to me, that won't affect me', since know they can identify more. – leader dental association |
| | I would say that other jurisdictions should do the same, evaluate their evidence to build the case of why it [HPV vaccination] is important, and see which public policies are important to facilitate it, and not only public policies but also interventions. – researcher |
| Consider the local setting, logistics for adoption, and collaborations | The part of adapting public policies to the culture is vital, not only so it can be implemented, but also for sustainability. The fact the government of PR is different from the one in Washington, and to the one in Florida; you must study all those internal idiosyncrasies, to see if they are barriers or to the contrary, sometimes they might be facilitators […]. – leader dental association |
| | Establish an integrated plan where all possible sectors can be involved in the decision-making process. - non-profit organization leader |
| | Yes, collaboration is always going to be important, because I believe not only in PR, but also in a lot of states, in a lot of places, they are going through times of resources shortage. So, having resources and making alliances with other groups who support the vaccine or support prevention, are aware of cancer prevention, work with that, obviously, that will be very important because you are going to be able to extend the resources. – government employee |
| | I think that what is fundamental is that it is not a single group effort, there must be a solid alliance that represents all sectors, the academia, the physicians, healthcare professionals, government, patients' organizations, the insurance companies, and the medical providers who are the ones who vaccinate. – pharmaceutical company employee |

### 3.2. Humanize and contextualize the problem

Most participants emphasized the need to use real stories and to 'put a human face on cancer'. For instance, Rhaiza was a young mother of three boys who was diagnosed with cervical cancer and decided to make her story public. This case created awareness around cervical cancer and made the problem a real possibility for the public. Participants also mentioned that data and evidence from other places or states can be useful to understand the issue, but noted the importance of using 'your' local epidemiological data and evidence (e.g., Puerto Rican cervical cancer rates, Puerto Rican HPV vaccine rates) to give context to the problem and highlight the need for the intervention.

### 3.3. Consider the local setting, logistics for adoption, and collaborations

Stakeholders noted the importance of considering the local setting, including the culture and governmental bureaucracies (e.g., local government processes such as review and approval timelines of the DOH), to anticipate barriers and facilitators to the adoption of the vaccine school-entry requirement. Additionally, most participants emphasized logistical aspects of policy implementation to consider, such as having funding to provide access to the HPV vaccine to the population. Some participants mentioned the need for a strategic plan to follow during implementation. Lastly, participants highlighted the importance of multisectoral collaborations, which they described as the inclusion of community members, non-profit organizations, policymakers, health professionals, academia, and private sectors in the decision-making process and to bridge limited resources.

## 4. Discussion

This report presents practical strategies that influenced the adoption of a vaccine school-entry requirement. In PR, the adoption of the HPV vaccine school-entry requirement can be evaluated, in part, through a bottom-up approach to policymaking (i.e., driven by diverse sectors of society, not necessarily starting with the top level of policymakers/politicians) (Birkland, 2019). Using the bottom-up approach allowed a more thorough understanding of policy creation and implementation by evaluating the 'network of actors' that participated in the process and focusing on local factors (Birkland, 2019). By studying these aspects, practical lessons can be learned (Birkland, 2019). Empowered with local data, stakeholders created multisectoral collaborations to combine limited resources. Moreover, educational efforts and the publicized case of Rhaiza facilitated the adoption process.

Rhaiza's case worked as a catalyst for increasing HPV-related and cervical cancer knowledge among the public (Vázquez-Otero et al., 2021a). It served to create a public face and champion that was relatable, as a mother, spouse, and daughter. Champions, usually studied at the organizational level, have been highlighted as needed for effective implementation (Miech et al., 2018). Moreover, humanizing the impacts of disease may prove useful among certain segments of the population who might be hesitant to be vaccinated.

Vaccine policy adoption and implementation may need to consider context-specific factors to help build trust and confidence among communities (Karafillakis et al., 2019). For instance, Hispanics show higher odds of support for HPV vaccine school-entry requirements compared to non-Hispanic Whites in the US (Calo et al., 2016). In the case of PR, perspectives about the implementation of the HPV vaccine school-entry requirement from parents of unvaccinated children were reported as mixed (Colón-López et al., 2021a). Half of the parents supported the policy, while those who were uncertain mentioned concerns related to the early age of vaccine administration, vaccine safety, and parental autonomy (Colón-López et al., 2021a). Therefore, it is important for individuals and organizations involved in vaccination efforts, such as local health departments, to adapt and tailor to context, including the politico-cultural context (Attwell et al., 2018), when considering vaccine policies and educational interventions. Educational campaigns may need to be developed for different cultures, identities, beliefs (e.g., political), historical backgrounds, and settings to increase not only knowledge about vaccines but also awareness and support of vaccine policies (Attwell et al., 2018; Vázquez-Otero et al., 2021b).

Lastly, developing stakeholder relationships, particularly multisector collaborations, is important to ensure adoption, dissemination, and implementation of vaccine policies. Community members, public health and medical professionals, members of the academia, non-profit organizations, policymakers, local health departments, physicians, school nurses and school staff are among the individuals and sectors that could be engaged in the process. In a study comparing vaccine mandates, Attwell et al. (2018) found the process of involving multiple stakeholders in formulating a comprehensive policy can lead to broader approval of new vaccine policies. Therefore, involving multiple stakeholders can not only ensure that diverse perspectives are being considered during the policymaking process, but also may increase policy legitimacy with the public.

### 4.1. Implications for public health practice and policymaking

Findings from this study may be applicable in establishing (state- and nationwide) vaccine policies and rollout in the future. It may be useful to work with communities to find trusted spokespersons for the policy topic (Sharfstein et al., 2021). Previous studies show that a naturally-residing champion in the context of implementation (Miech et al., 2018), humanizes the problem and can influence policy level changes. In the case of PR, the public followed Rhaiza, who provided context, a personal connection, and implications from a cervical cancer diagnosis.

When developing future policies that implement vaccine mandates, consideration of the politico-cultural context (Attwell et al., 2018) may be particularly important as political beliefs have become entrenched with vaccine policy. In the case of PR, a broad coalition of individuals and organizations from multiple facets of society (i.e., physicians, non-profit organizations) convened to rally for support of the mandate (Vázquez-Otero et al., 2021a). Broad support from multiple stakeholders may be needed in future vaccine policy development to rally political support.

Diverse perspectives need to be included when thinking about and implementing vaccine mandates that affect historically marginalized populations (e.g., groups with limited access to providers who can offer the required vaccine). This is especially important for both policy and practice as equitable solutions are needed and should include the perspectives and solutions for all. In the case of PR, the HPV vaccine was covered for eligible students, via the federal program *Vaccines for Children*, the government-funded insurance, or private insurance (Vázquez-Otero et al., 2021a). Ensuring equitable vaccine access, specifically where the mandates are to be implemented, may be needed to ensure health inequities are not exacerbated (Peterson et al., 2021).

The COVID-19 pandemic has exacerbated issues of health inequities, especially those affecting disenfranchised communities (Mackey et al., 2021). Moreover, the US has had high levels of vaccine hesitancy towards the COVID-19 vaccine. This has been, in part, due to the misinformation and political polarization surrounding the COVID-19 vaccine (Sharfstein et al., 2021). Not only are COVID-19 vaccine levels suboptimal, but many children are now behind on other vaccines (e.g., Polio, DTaP, MMR) required for school (DeSilva et al., 2022; Patel Murthy et al., 2021). While this study occurred prior to COVID-19 vaccine rollout, it can inform our understanding of factors that could facilitate the adoption and implementation of vaccine policies and help to bring children up-to-date on vaccine schedules needed for school. For example, personal stories of people directly affected by COVID-19 – either themselves directly or a loved one – may be a powerful narrative to increase vaccination as well. Findings highlight the need to understand the contextual (e.g., government processes) and cultural distinctions (e.g., local epidemiological data and champions or trusted spokespersons) of the communities where vaccination requirements would be implemented to anticipate barriers and leverage existing resources. Nonetheless, the policy adoption and implementation strategies identified should be further explored to determine if these are relevant with regards to different vaccines, populations, and contexts.

## 5. Limitations

While this study gathered practical recommendations for the adoption and implementation of the HPV vaccine school-entry requirement in future settings, there are limitations. First, the socio-political context of vaccine implementation in PR may be different than in other states in the US, limiting the generalizability of these findings. As a result of

socio-political differences, barriers and facilitators, including resources and political will, to adopt and implement vaccine requirements may vary in other states. Second, while this study intended to understand different views, certain perspectives, such as people from the religious sector and from stakeholders who were against the requirement, were not captured. Future research should explore a variety of perceptions towards vaccine requirements for HPV and other vaccines, especially given the current political discourse surrounding vaccines and vaccine policies.

## 6. Conclusion

The combination of education efforts, availability of local data, identification of local champions, and multisectoral collaborations facilitated the adoption of the HPV vaccine requirement in PR. Findings highlight the importance of contextual and cultural distinctions of the communities where vaccination requirements would be implemented to anticipate barriers and leverage existing resources. These practical lessons may be useful to public health professionals and policymakers who are considering the adoption and implementation of vaccine policies in other settings to ensure equitable vaccine access.

## CRediT authorship contribution statement

**C. Vázquez-Otero:** Conceptualization, Methodology, Formal analysis, Investigation, Writing – original draft, Writing – review & editing. **E. Lockhart:** Formal analysis, Validation, Writing – original draft, Writing – review & editing.

## 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.

## Data availability

The data that has been used is confidential.

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