

Roxana Soto-Abreu<sup>1</sup>; Manuel E. Rivera-Encarnación<sup>1</sup>; Vilnery Rivera-Figueroa<sup>2</sup>; Glizette O. Arroyo-Morales<sup>2</sup>; Diana T. Medina-Laabes<sup>1</sup>; Olga L. Díaz-Miranda<sup>1</sup>; Pamela C. Hull<sup>6</sup>; Ana P. Ortiz-Martínez<sup>3</sup>; Erick L. Suárez-Pérez<sup>4</sup>; María E. Fernández<sup>5</sup>; Vivian Colón-López<sup>7</sup>

<sup>1</sup>Comprehensive Cancer, Division of Cancer Control and Population Sciences Center; <sup>2</sup>University of Puerto Rico, Medical Sciences Campus, School of Public Health, Department of Health Administration, Evaluative Research of Health Systems Program; <sup>3</sup>Comprehensive Cancer Center, Division of Cancer Control and Population Sciences; University of Puerto Rico, Medical Sciences Campus, School of Public Health, Department of Biostatistics and Epidemiology; <sup>4</sup>University of Puerto Rico, Medical Sciences Campus, School of Public Health, Department of Biostatistics and Epidemiology; <sup>5</sup>University of Texas Health Science Center at Houston; Center for Health Promotion and Prevention Research School of Public Health; <sup>6</sup>Vanderbilt University School of Medicine, Department of Medicine; <sup>7</sup>Comprehensive Cancer Center; Division of Cancer Control and Population Sciences; University of Puerto Rico, Medical Sciences Campus, School of Public Health, Department of Health Administration, Evaluative Research of Health Systems Program

## Background

- School-entry vaccination mandates have been widely as a mechanism to ensure high immunization coverage rates <sup>1</sup>
- In August 2018, Puerto Rico (PR) mandated a Human papillomavirus (HPV) vaccine school-entry policy for student's ages 11 to 12 years <sup>2</sup>
- This new requirement in PR presents an opportunity to study the implementation process across a 5 years period (2018-2023).
- This analysis is part from the Human Papillomavirus Policy Implementation Vaccination (HPV-PIVAc) study, an R01 study funded by the National Cancer Institute that started on December 2018.
- Purpose of HPV-PIVAc:
  - Document barriers and facilitators of the school-entry policy implementation
  - Estimate the increase of HPV vaccination before and after the implementation
  - Understand the geographic variation of HPV vaccine policies across US states and territories.

## Study Objectives

Conduct key informant interviews to document factors that facilitate or impede a successful HPV vaccine school policy implementation in PR.

## Methods

- We conducted 38 key informant semi-structured interviews with stakeholders in the Department of Health (DOH), school system, healthcare organizations, community-based organizations and coalitions in PR (in favor and against the school-entry policy) from July 2018 to September 2019.
- Interviews were conducted face to face or over the phone.
- The interview's guide included relevant domains based on the Consolidated Framework for Implementation Research (CFIR) <sup>3</sup>
- CFIR has been used for identifying potential barriers and facilitators, and understand multiple contexts that may influence implementation <sup>4,5</sup>
- We transcribed interviews verbatim.
- Of the total interviews completed, we used 7 interviews to code using the CFIR domains. <sup>6</sup>
- Data was analyzed by two independent researchers using Atlas.ti
- Those 7 interviews were KI from schools (n=3), DOH (n=2), healthcare organizations (n=1), and CBOs (n=1).
- We documented barriers and facilitators for the implementation of this school-entry policy.

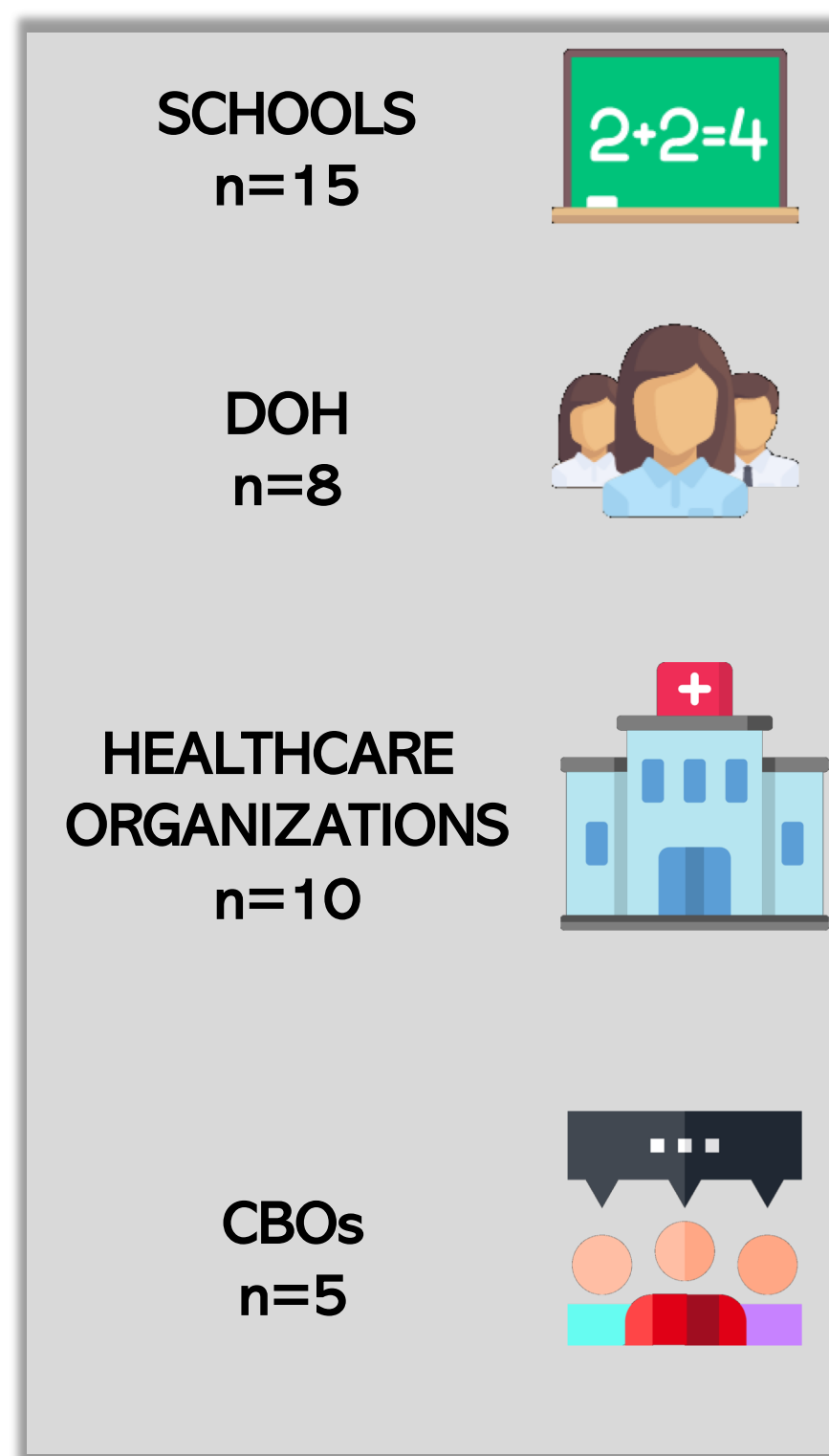


Fig 1: Key Informants recruitment by organization

## Results

### BARRIERS

Intervention characteristics	Outer setting	Inner Setting	Characteristics of Individuals	Process
<b>Complexity</b> <ul style="list-style-type: none"><li>✓ Problems with doses completion</li><li>✓ Rigorous requirements perceived between public and private schools</li><li>✓ Lack of access to find the vaccine (private health insurances)</li></ul>	<b>Parent needs and resources</b> <ul style="list-style-type: none"><li>✓ Lack of information of the school-entry policy and vaccine relevance</li></ul> <b>Negative influence of social media</b> <ul style="list-style-type: none"><li>✓ Myths, doubts, secondary effects</li></ul>	<b>Network and communications</b> <ul style="list-style-type: none"><li>✓ Miscommunication between implementers (DOH and schools)</li></ul> <b>Access to knowledge and information</b> <ul style="list-style-type: none"><li>✓ School directors and teachers were detached from the implementation process</li></ul> <b>Available resources</b> <ul style="list-style-type: none"><li>✓ Lack of staff (school nurses)</li></ul>	<b>Knowledge and beliefs about the implementation</b> <ul style="list-style-type: none"><li>✓ Ignorance about the policy, the vaccine and its benefits by some implementers</li></ul>	<b>Innovation participants</b> <ul style="list-style-type: none"><li>✓ Parental detachment from policy</li></ul>

"This [the HPV school-entry policy] is in 'diapers', right, and we [the DOH] all know it because it was recently approved and as it is necessary to strength; I would say a little more the education campaign. We are in that process..."

Health educator from the DOH

"No, by the way, here the only thing that I received was the memo that the vaccine was mandatory, but [no one from the DOH] has come [here to inform about the school-entry policy]... That's why I tell you, the misinformation, I think, has been the problem with this vaccine..."

School director (private)

"No, [the] school staff did not [received any training], not even the directors who are the ones implementing the law ..."

School nurse

### FACILITATORS

Intervention characteristics	Outer setting	Inner Setting	Characteristics of Individuals	Process
<b>Cost</b> <ul style="list-style-type: none"><li>✓ HPV vaccine is covered by health insurances</li></ul> <b>Relative advantage</b> <ul style="list-style-type: none"><li>✓ The power of the Secretary of Health to include vaccines required for school-entry</li><li>✓ Reach almost all target population</li></ul>	<b>Parent needs and resources</b> <ul style="list-style-type: none"><li>✓ Vaccine availability regardless of their medical plan status</li></ul>	<b>Access to knowledge and information</b> <ul style="list-style-type: none"><li>✓ Training and education from DOH and external agents to nurses (only)</li></ul> <b>Leadership engagement</b> <ul style="list-style-type: none"><li>✓ Compromise by nurses (from clinics and schools)</li></ul>	<b>Knowledge and beliefs about the vaccine</b> <ul style="list-style-type: none"><li>✓ Enforce messages by school and health nurses</li></ul>	<b>Champions</b> <ul style="list-style-type: none"><li>✓ Regional school nurses</li><li>✓ VOCES (vaccination coalition)</li></ul> <b>External change agents</b> <ul style="list-style-type: none"><li>✓ VOCES (vaccination coalition) in charge of giving capacity to school nurses</li></ul>

"Public sector, I understand that yes, the [HPV vaccine] is completely free, it covers from 0 to 18 years old..."

DOH program coordinator

I've achieved that people [parents] have done it [vaccinated their children]... "look mom, give him this vaccine, you are protecting him, you will not expose your child to a condition when you could have avoided it". And I have had [see parents change their position], but it has not been easy, then I tell them that is not so much because of the requirement, it is because they need to be protected

School nurse

DOH not enough

HPV hesitancy

Organizational commitment

Views about parental opinion

Unawareness

Disconnect within organization

Fig. 2: CFIR additional codes

## Conclusions

- In this preliminary analysis, the barrier most mentioned by participants was the lack of clear information about the policy given to the community and the target population (parents).
- The facilitator most mentioned by key informants was the leadership engagement by nurses (from clinics and schools) to take the message to adolescents/parents and educate about the vaccine and its school-entry mandate.
- Several implementation barriers could affect the impact. Findings from this study can be used for improving policy procedures and implementation and to inform states/territories considering adopting similar immunization policies. Information generated will help determine adaptations/modifications that may be needed for policy implementation in PR and other populations in the future.

## Future Analysis

Expand the group of key informants to recruit policy makers, journalists and religious groups in favor and against the HPV vaccine implementation. We will also perform a rating analysis according to CFIR, to calculate the magnitude and valence, and the strength to quantify the quotes.

## Funding Source

1R01CA232743-01A1 from the National Institutes of Health. *Implementation of School-Entry Policies for Human Papillomavirus Vaccination on Schools.*

## References

- Guide. TC. What Works: Increasing Appropriate Vaccination. <https://www.thecommunityguide.org/sites/default/files/assets/What-Works-Factsheet-Vaccination.pdf>. Published 2017.
- Puerto Rico Orders Students to Get Vaccinated Against HPV | Health News | US News. <https://www.usnews.com/news/news/articles/2017-06-12/puerto-rico-orders-students-to-get-vaccinatedagainst-hpv>. Accessed December 8, 2017
- Center for Clinical Management Research. Consolidated Framework for Implementation Research. <http://www.cfirguide.org/>. Accessed October 4, 2017.
- Damschroder LJ, Aron DC, Keith RE, Kirsh SR, Alexander JA, Lowery JC. Fostering implementation of health services research findings into practice: a consolidated framework for advancing implementation science. *Implement Sci.* 2009;4(1):50. doi:10.1186/1748-5908-4-50.
- Nilsen P. Making sense of implementation theories, models and frameworks. *Implement Sci.* 2015;10:53. doi:10.1186/s13012-015-0242-0.
- The Consolidated Framework for Implementation Research. <https://cfirguide.org/evaluation-design/qualitative-data/>