

Compliance with Influenza Vaccination and Cervical, Breast, and Colorectal Cancer Screening in a Sample of Women in Puerto Rico: Community Engagement Efforts from PR-CEAL

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Objective: There are an estimated 5,570 yearly cancer deaths in Puerto Rico. Breast and colorectal are the most common malignancies among Puerto Rican women. Therefore, prevention and early detection of these cancer types are critical to reducing morbidity and mortality. This study assessed whether women who received the influenza vaccine had increased adherence to cervical, breast, and colorectal cancer screening.

Methods: The Puerto Rico Community Engagement Alliance (PR-CEAL) against COVID-19 Disparities team attended community outreach events throughout Puerto Rico and completed a face-to-face survey among women 18 years or older. The survey gathered demographic information and adherence to influenza vaccination and cervical, breast, and colorectal screening in the past year. The initial sample included 400 women, of whom 347 met the age inclusion criteria (21-74 years). Chi-square tests were used to compare cancer screening adherence according to influenza vaccination status. A p-value <0.05 was considered statistically significant.

Results: Of all participants, 47.0% received the influenza vaccine in the past year. Cancer screening rates among vaccinated and non-vaccinated women were as follows: 64.5% vs. 13.0% vs. 8.0% for colorectal cancer (p-value=0.19).

Conclusion: Adherence to cervical, breast, and colorectal cancer screening in the past year did not differ by influenza vaccination status. Influenza vaccination appointments may therefore represent a missed opportunity to promote preventative cancer screening in Puerto Rico. [*PR Health Sci J* 2023;42(4):318-321]

Key words: Influenza vaccination, Breast cancer, Colorectal cancer, Cervical cancer, Preventative cancer screening

An estimated 5,570 people die of cancer in Puerto Rico every year (1). Among Puerto Rican women, breast and colorectal represent the two most common types of cancer (1). Additionally, the incidence of cervical cancer is higher in Puerto Rico than in any other US state or territory (2). Because of their high incidence, tackling these cancer types will be critical in reducing cancer morbidity and mortality in Puerto Rico.

Fortunately, screening tests are available for breast (3), colorectal (4), and cervical (5) cancers and may substantially decrease the mortality for all three types of cancer (3-5). However, research suggests that, relative to the continental United States, Puerto Rico has lower rates of colorectal (6) and cervical (7) cancer screening. It is therefore crucial to understand cancer screening barriers and facilitators in Puerto Rico.

Several studies that included Puerto Ricans living in Puerto Rico and in the mainland United States identified barriers to colorectal (8), cervical (9), and general (10) cancer screening

that include stigma (8, 9), lack of knowledge (8, 9) and lack of health insurance and/or money (8, 10). These studies also found that facilitators of cancer screening include recommendation by a healthcare provider (8, 10) and trust in the people associated with cancer screening (10). Based on these studies, recommendation for and education about cancer screening by healthcare providers may be critical in increasing cancer screening in Puerto Rico.

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One common way that people come into contact with healthcare providers is through routine influenza vaccination administration. For example, an estimated 30.3% of Puerto Rican adults received the influenza vaccine during the 2021-2022 season (11). Additionally, some research suggests that people are open to receiving information on cancer screening at influenza vaccination appointments (12). We therefore hypothesize that Puerto Ricans who have received the influenza vaccination will be more likely to report receiving recommended cancer screening.

No previous studies have examined the association between influenza vaccination status and cancer screening in Puerto Rico. To address this gap, we used data from The Puerto Rico Community Engagement Alliance (PR-CEAL) against COVID-19 disparities. PR-CEAL is an initiative by the National Institutes of Health to promote education and prevention of COVID-19 (13). As part of their field activities, the PR-CEAL outreach team attended weekly community outreach events throughout Puerto Rico. At these events, the outreach team recruited women 18 years or over who completed an online community survey that included questions about influenza vaccination status and cancer screening behavior. We used this data to assess whether women who received the influenza vaccine in the past year had higher compliance with cervical, breast, and colorectal cancer screening recommendations.

Methods

All data came from a survey administered by the PR-CEAL outreach team at community events throughout Puerto Rico. The survey, which was not validated, was developed specifically for PR-CEAL's outreach work and collected information on participant demographics and past medical history. Questions included on the survey included age, educational attainment, and compliance with influenza vaccination and cervical, breast, and colorectal screening in the past year. Data were collected between February and July 2022. We used the United States Preventative Services Task Force guidelines to determine eligibility and compliance with breast (age 50-74 years) (14), colorectal (age 45-75) (15), and cervical (age 21-65) (16) cancer screening guidelines.

Ethics statement

The study was deemed exempt by the Comprehensive Cancer Center-University of Puerto Rico Institutional Review Board.

Statistical analysis

Participants were excluded from the study if they were age <21 years or >75 years. Participants outside the recommended age for each cancer screening test were excluded from the corresponding analysis. We used Pearson χ^2 test to compare the percentage of women who received recommended breast, colorectal, and cervical cancer screening by influenza vaccination status. A p-value <0.05 was considered statistically significant. All analyses were performed using R version 4.1.2 and RStudio.

Results

The initial sample included 400 women, of whom 53 were excluded because they were age <21 years or >75 years. The final sample included 347 women with a median age of 59 (range: 21-75; Table 1). Of these, 50.1% had a high school degree or less, 23.6% had some college, and 26.2% had a college degree or more. Less than half (43.5%) of women self-reported influenza vaccination in the past year.

The number of women eligible for cancer screening were as follows: 243 for breast cancer, 252 for colorectal cancer, and 238 for cervical cancer. More than 80% of vaccinated women and 70.9% of unvaccinated women underwent breast cancer screening (p-value = 0.08, Figure 1a). The percentage of vaccinated and unvaccinated women screened for colorectal cancer was 13.0% and 8.0%, respectively (p-value = 0.19, Figure 1b). Nearly two-thirds of vaccinated women (64.5%) and over half (53.1%) of unvaccinated women underwent cervical cancer screening (p-value = 0.08, Figure 1c).

Conclusion

This study of adult women in Puerto Rico found that women who received the influenza vaccine had higher compliance of breast, colorectal, and cervical cancer screening in the past year than did women who did not receive the influenza vaccine; however, the differences between the two groups were not significant.

Table 1. Participant demographics (n=347)

Variable	Frequency	Percent
<i>Age (years)</i>		
21-39	49	14.1
40-59	139	40.1
60-75	159	45.8
<i>Education</i>		
Less than high school	72	20.7
High school graduate	102	29.4
Some college	82	23.6
College or more	91	26.2
<i>Influenza vaccination</i>		
Yes	151	43.5
No	196	56.5

Table 2. Percentage of women receiving cancer screening in the past year by influenza vaccination status.

Screening type	Screening	No screening
<i>Breast cancer (N = 243)</i>		
Vaccination	88 (80.7%)	21 (19.3%)
No vaccination	95 (70.9%)	39 (29.1%)
<i>Colorectal cancer (N = 252)</i>		
Vaccination	15 (13.0%)	100 (87.0%)
No vaccination	11 (8.0%)	126 (92.0%)
<i>Cervical cancer (N = 238)</i>		
Vaccination	60 (64.5%)	33 (35.5%)
No vaccination	77 (53.1%)	68 (46.9%)

It is possible that women who received the influenza vaccine are more likely than their peers to undergo preventative cancer screening, but the current study was insufficiently powered for results to reach the level of significance. This explanation is supported by the fact that 252 or fewer women in our sample were eligible for each type of screening. Additionally, the results for both breast cancer and cervical cancer trended toward significance (p-value = 0.08 for both).

Another possibility is that vaccination is not associated with higher rates of cancer screening. In this case, vaccination appointments may represent a missed opportunity to promote routine preventative cancer screening. In past studies, women have reported that recommendation by a healthcare provider is essential for seeking preventative cancer screening (17-19). Additionally, one study found that patients are receptive to information about cancer screening given by health professionals administering influenza vaccines (12). Therefore, it may be important to explore the possibility of promoting screening at vaccination appointments.

In addition to the limited sample size, this study had several limitations. The study's cross-sectional design obscures any temporal relationship between vaccination and cancer screening. Additionally, the study used self-reported data, which may introduce recall and social desirability biases. Most participants were recruited from community health fairs. People who attend health fairs and who elect to complete a voluntary survey may differ meaningfully from their peers in terms of health promotion behaviors. Therefore, results from this sample may not generalize to the larger Puerto Rican population. However, preventative screening rates seen in this sample were consistent with those found by the 2020 Behavioral Risk Factor Surveillance System (20).

This study has implications for individual healthcare workers, researchers, and public health agencies. Health professionals who administer vaccines should consider using these appointments as an opportunity to educate patients about cancer screening and other routine preventative health services. Researchers should consider studying how best to

promote vaccines and preventative health services effectively and efficiently during vaccination appointments or other routine patient interactions with the healthcare system. Finally, public health agencies should consider taking steps to better utilize vaccination appointments to promote cancer screening and preventative health services. These steps could include designing educational materials, creating automatic electronic health record reminders, and training health professionals to recommend preventative services to patients.

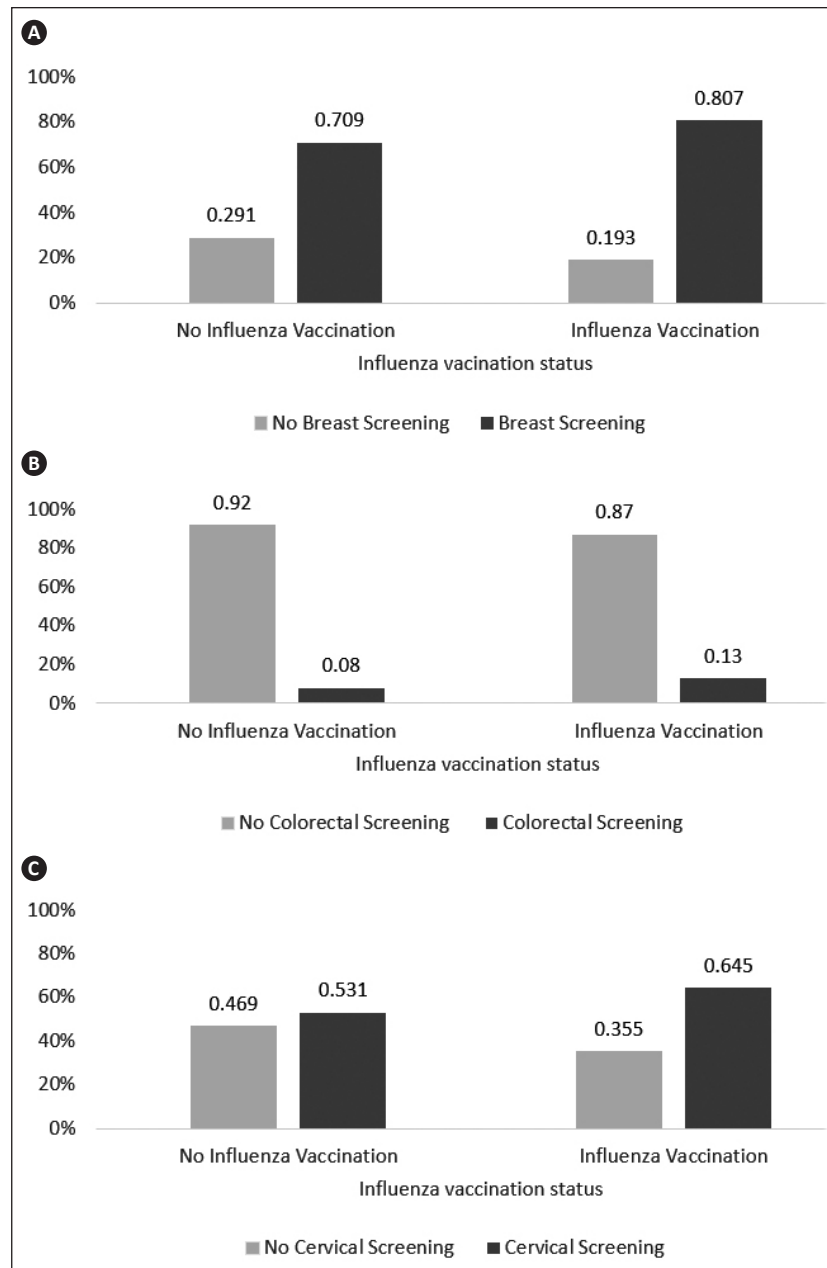


Figure 1. Percentage of women receiving cancer screening in the past year by influenza vaccination status. Pearson χ^2 test showed no significant differences in rates of cancer screening by vaccination status. Cancer screening type: a) breast (n=243, p=0.08), b) colorectal (n=252, p=0.19), c) cervical (n=238, p=0.08).

Resumen

Objetivo: En Puerto Rico se estima un total de 5,570 muertes anuales a causa del cáncer. El cáncer de mama y colorrectal son dos de las malignidades más comunes que afectan a las mujeres puertorriqueñas. Por lo tanto, la prevención y detección temprana de estos tipos de cáncer son importante para reducir la morbilidad y mortalidad. Este estudio evaluó si las mujeres que recibieron la vacuna contra la influenza tienen una mayor adherencia a pruebas de detección temprana para cáncer de cuello uterino, mama y colorrectal. **Métodos:** El equipo de La Alianza de Participación Comunitaria de Puerto Rico (PR-CEAL, por sus siglas en inglés) contra las Disparidades del COVID-19 participó de una serie de actividades comunitarias en toda la isla. En estas actividades, completaron una encuesta cara a cara a mujeres mayor a 18 años. La encuesta recopiló información demográfica y la adherencia a la vacunación contra la influenza y pruebas de detección temprana para cáncer de cuello uterino, mama y colorrectal en el último año. La muestra inicial incluyó a 400 mujeres, de las cuales 347 cumplieron los criterios de inclusión de edad (21-74 años). Se utilizaron Pruebas de Chi-cuadrado para comparar la adherencia a pruebas de detección temprana de cáncer de cuello uterino, mama y colorrectal según el estado de vacunación contra la influenza. Un valor de $p < 0.05$ fue considerado estadísticamente significativo. **Resultados:** Del total de participantes, el 47.0% recibió la vacuna contra la influenza en el pasado año. Las tasas de pruebas de detección temprana entre las mujeres vacunadas o no vacunadas fueron las siguientes: 64.5% vs. 53.1% para cáncer de cuello uterino (valor $p = 0.08$), 80.7% vs. 70.9% para cáncer de mama (valor $p = 0.08$) y 13.0% vs. 8.0% para cáncer colorrectal (valor $p = 0.19$). **Conclusiones:** La adherencia a las pruebas de detección temprana de cáncer de cuello uterino, mama y colorrectal en el último año no difirió según el estado de vacunación contra la influenza. Por lo tanto, las citas para la vacunación contra la influenza pueden representar una oportunidad perdida para promover las pruebas de detección de cáncer en Puerto Rico.

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