

HPV Vaccination in Florida: Where we are, where we need to be and how to get there

Background

- Human papilloma virus (HPV) causes significant but preventable morbidity and mortality. HPV is responsible for cancers including anus, penis, vagina, vulva, and oropharyngeal. Cervical cancer is the most common cancer caused by HPV and HPV is associated with approximately 90% of all cervical cancer cases each year [1].
- The biggest breakthrough in preventing HPV associated diseases were the three HPV vaccinations. The HPV vaccinations were first introduced in 2006 and have been a significant public health priority.
- According to National Immunization Survey (NIS) Teen Data, in 2016, several Southern states lagged behind HPV vaccination rates in comparison to Western and Northeastern states. Florida in particular was found to have a baseline low HPV vaccination rate in both 2009 with less than 40% and 2016 with approximately 55% whereas New York had high vaccination rates of approximately 50% in 2009 and greater than 70% in 2016 [2].

Objective

- To study the impact of HPV vaccination, we compared age-adjusted cervical cancer incidence and death rates in New York, a state with a high HPV vaccination rate, to Florida, a state with a lower vaccination rate, prior to HPV vaccination and 10 years post HPV vaccination availability.

Methods

- This is an ecologic study comparing the cervical cancer incidence and death rates in Florida to New York.
- Florida and New York's incidence and death rates were reported in years 2005 (pre HPV vaccination) and 2016 (post HPV vaccination) by utilizing state-wide cancer registries from each state's public health departments [3, 4].
- Rates were reported as rate per 100,000, female population.
- Datasets were public and no IRB approval was necessary.
- Cervical cancer age-adjusted incidence and mortality rates were calculated through Statistical Analysis System (SAS).
- Incidence and mortality were evaluated by the following groups: NY vs. FL in 2005, NY vs. FL in 2016, FL 2005 vs. 2016, and NY 2005 vs. 2016. Values were compiled using SDRATE method in SAS.
- Directly standardized rate ratios are identified for the study population, with crude rates, standardized error, and 95% confidence limits.
- The rate effect estimates are identified, in addition to the ratio and 95% confidence limits. A p-value of 0.05 or less was considered statistically significant.

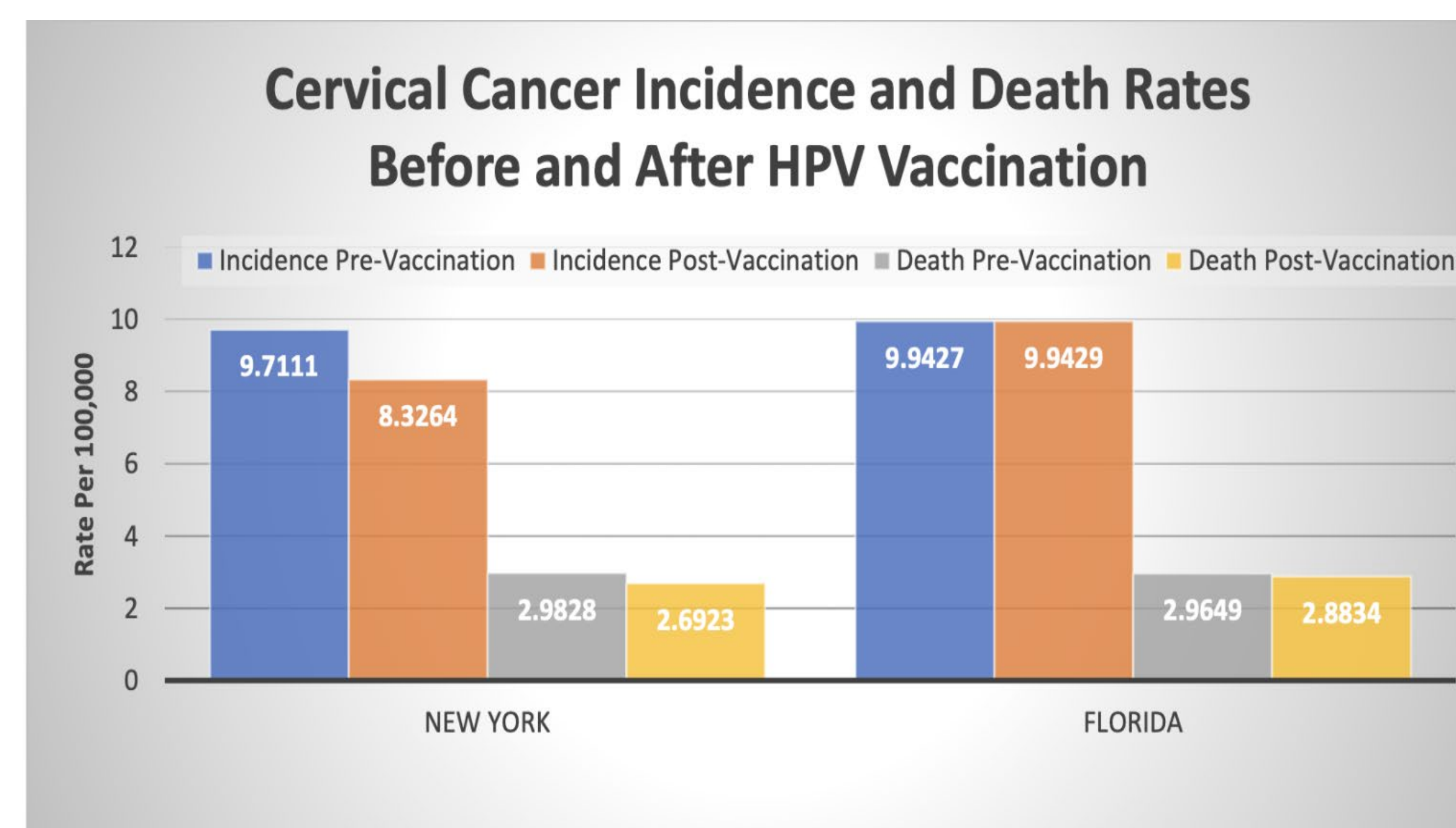
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Results

- FL was found to have a low HPV vaccination rate in 2009 with less than 40% compared to NY with a high rate of 50% in 2009.
- By 2016, Florida's HPV vaccination rate improved to 55% but was still low compared to New York with a rate greater than 70%.
- NY had a decline of cervical cancer incidence of 9.7 per 100,000 in 2005 to 8.3 in 2016. NY had a decrease in death rate from 3.0 in 2005 to 2.7 in 2016.
- In FL, the cervical cancer incidence rate from 2005 to 2016 increased from 9.7 to 9.9 and the mortality was 3.0 in 2005 and 2.9 in 2016.
- When comparing NY's incidence rates, there was a statistically significant drop in age-adjusted incidence before HPV-vaccination compared to 10 years post vaccination availability.
- When analyzing cervical cancer incidence in 2016, there was a statistically significant increase in cases between Florida's incidence compared to New York's.

Table 1. Directly Standardized Cervical Cancer Age-Adjusted Incidence and Death Rates Effects in 2005 and 2016: Florida and New York

State/year	Comparison	Incidence Rate Ratio (95% CI)	Mortality Rate Ratio (95% CI)	Incidence p-value	Death p-value
FL 2005	NY 2005	1.0033 (0.9154-1.0994)	0.994 (0.8428-1.172)	0.9446	0.943
FL 2016	NY 2016	1.9141 (1.09003-1.308)	1.071 (0.909-1.2615)	<0.0001	0.4124
FL 2005	FL 2016	0.9965 (0.9115-1.089)	1.065 (0.9077-1.249)	0.9383	0.44003
NY 2005	NY 2016	1.2096 (1.10131-1.328)	1.178 (0.9947-1.395)	<0.0001	0.0576



Discussion

- The results demonstrated that NY had a larger and statistically significant downtrend in cervical cancer incidence in comparison to FL since the introduction of the HPV vaccination.
- Pre and post vaccination, there was minimal change in cervical cancer death trends in FL but NY had a non-statistically significant downtrend in mortality.
 - Likely attributed by low death rate associated with cervical cancer
- This may be due to lagging HPV vaccination rates in FL in addition to other sociodemographic or healthcare factors [5].
 - FL is characterized by negative social determinants of health with cancer disparities in women of black race, Hispanic ethnicity, and populations with lower socioeconomic status
 - FL has almost three times more individuals not enrolled in schooling in comparison to NY
 - FL is one of the 12 states that hasn't expanded its Medicaid eligibility

Limitations

- Since the COVID pandemic, many state registries have been lagging in updating cancer registries; data was unavailable for 2019-2021
- New York and Florida have multiple demographic and socioeconomic differences that could not be accounted for in this data analysis.
- We can't conclude these differences are directly linked to HPV vaccination rates, cervical cancer incidence, or a combination of both.

Conclusion

- The medical community, local organizers and public health departments within Florida need to work together to address the barriers to HPV vaccination and promote educational, informative, structured programs to increase HPV vaccination rates.
- Increasing HPV vaccination rates will not only reduce the incidence and mortality of cervical cancer.

References

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