**Abstract**

**Objective:**  The Advisory Committee on Immunization Practices (ACIP) advised vaccinating young adults against Human Papillomavirus (HPV) in 2006, aiming to prevent HPV-related cancers and genital warts. As these preventive measures have spread rapidly, understanding vaccination patterns is essential for informing targeted public health interventions. This study aimed to explore the demographic disparities, temporal trends, and geographical patterns of HPV vaccine administration by analyzing large-scale immunization registry vaccine data for Long Island (LI) (Nassau and Suffolk Counties), New York (NY).

**Methods:** The vaccine registration data retrieved from the New York State Immunization Information System (NYSIIS) was used to assess the HPV vaccine administration rate from 2012 to 2023. Patients’ demographic information and regional variations were evaluated to identify the disparities between different subgroups. The analysis was conducted between 2023 and 2024.

**Results:** The HPV vaccination rate among LI children ages 9 to 13 demonstrates a growth of 284.43% from 2012 to 2019 and a slight decrease of 5.04% around 2020. Around 68.07% of individuals received their first dose before their 15th birthday and 24.95% of them followed the recommended routine to receive 2 doses in half a year. Spatially, eastern LI consistently holds a higher HPV vaccination rate than northwestern LI.

**Conclusions**: The rising trend in HPV vaccination coverage on LI with a modest drop around 2020 indicates the likely impact of COVID-19 pandemic. Additional attention is called to be paid to the regions with the lower uptake rates given the uneven distribution of the vaccine coverage to prevent HPV-related cancers.