

## Delaware's HPV vaccination rates rise with evidence-based intervention implementation

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### Background

The Human Papilloma Virus (HPV) is a major factor in cancer incidence, as it causes cancers of the cervix, anus, vulva, vagina, penis, and oropharynx.<sup>1</sup> More than 90% of cervical and anal cancers are caused by HPV.<sup>2,3</sup> In addition, HPV causes 70% of vaginal/vulvar cancers, 63% of penile cancers, and 70% of oropharyngeal cancers.<sup>3</sup> Of the 34,800 HPV-related cancer cases that occur annually in the United States, an estimated 90% could have been prevented with HPV vaccination.<sup>2</sup>

Nationally and locally, the Centers for Disease Control and Prevention (CDC) and public health agencies are actively engaged in vaccinating adolescents by age 13 to align with recommendations and reporting metrics. Yet in the United States and Delaware, HPV vaccination rates are suboptimal compared to other adolescent vaccination coverage rates. According to data from the 2017 and 2018 National Immunization Survey-Teen (NIS-Teen), Delaware's  $\geq 1$ HPV<sup>4</sup> coverage rate decreased from 75.3% in 2017, to 73.9% in 2018.<sup>5</sup> According to 2018 NIS-Teen, the vaccine coverage rates in Delaware for three recommended adolescent vaccinations are:  $\geq 1$ Tdap: 89.1%,  $\geq 1$  MenACWY: 85.9%,  $\geq 1$ HPV: 73.9%, and HPV up-to-date (UTD),<sup>4</sup> 58.4% with a 95% confidence interval.<sup>6</sup>

To identify effective strategies to increase HPV vaccination rates, the Delaware Department of Health and Social Services, Division of Public Health (DPH) Immunization Program collaborated with the Delaware Cancer Control Program to explore unique ways of creating awareness of the importance of HPV immunization among providers. Specifically, this project focused on providing evidence-based education, Immunization Information System (IIS) support, and technical assistance for local providers.

### Intervention

The Immunization Program contracted with Quality Insights, a non-profit organization with a mission to utilize data and community solutions to improve healthcare quality.<sup>7</sup> Quality Insights developed an evidence-based curriculum founded on the CDC's "You are the Key to HPV Cancer Prevention" campaign, utilizing both CDC and DPH resources. In addition, Quality Insights conducted a literature review on topics including the benefits of vaccinating at an early

age, HPV cancers, long term outcomes and safety, implementation of evidence-based interventions, and utilization of the IIS – known as DelVAX – to improve vaccination rates. The National HPV Vaccination Roundtable action guides and DelVAX user guides were additional resources.

Quality Insights provided education and training for 30 Vaccines for Children (VFC) practices, whose up-to-date (UTD) HPV coverage rate was below 50%. The educational activity sessions ranged in size from small groups to one-on-one training (academic detailing) with providers. DelVAX data was used to create a baseline and to facilitate pre-post education comparison. The retrospective “pre” consisted of the initial coverage assessment, followed by an intervention period of 6 and 12 months. During the intervention period, Quality Insights shared multiple evidence-based workflow modifications with the practices and assisted them in choosing and implementing these into their workflow. Practices utilized a variety of quality improvement strategies categorized as patient-focused, provider-focused, and practice workflow.

#### **Patient-Focused Quality Improvement Strategies to Increase HPV Vaccination Rates, Delaware, 2018-2020**

- Patient postcard reminder campaign\*
- Reminder magnets\*
- Early education of parents\*\*
- Patient/parent reminders for a nurse visit\*\*
- Use of resources for patients/parents (patient-facing handouts, posters, videos)\*\*

\* Services provided by Quality Insights

\*\* Area in which Quality Insights can assist

#### **Provider-Focused Quality Improvement Strategies to Increase HPV Vaccination Rates, Delaware, 2018-2020**

- Academic detailing for providers\*
- HPV education for staff\*
- Strong provider vaccination recommendation/bundling\*\*
- Focusing conversation on HPV vaccine is cancer prevention\*\*
- Provider engagement\*\*
- Clinical decision support – provider reminders\*\*
- Use of resources for staff (National HPV Vaccination Roundtable Action Guides)

\* Services provided by Quality Insights

\*\* Area in which Quality Insights can assist

#### **Practice Workflow, Quality Improvement Strategies to Increase HPV Vaccination Rates, Delaware, 2018-2020**

- Data reconciliation\*
- Pocket cards for providers\*

- Scheduling next immunization appointment/nurse visit at checkout\*\*
- Leveraging the IIS (data cleanup, patient inactivation, adding historical records, reports)\*\*
- Assigning an HPV campaign champion\*\*
- Standing orders\*\*
- Patient/parent and staff engagement (t-shirts, small giveaways)\*\*

\* Services provided by Quality Insights

\*\* Area in which Quality Insights can assist

Quality Insights documented the intervention implementation to improve and sustain rates. Ongoing technical assistance was provided, along with DelVAX support (including assistance with data reconciliation, cleanup and reports), workflow modification implementation, post-training access to HPV-related webinars and podcasts, targeted data-driven social media posts, and a dedicated HPV-immunization webpage. During the post-training phase, a second identical assessment was conducted to evaluate provider vaccination rates.

## Results

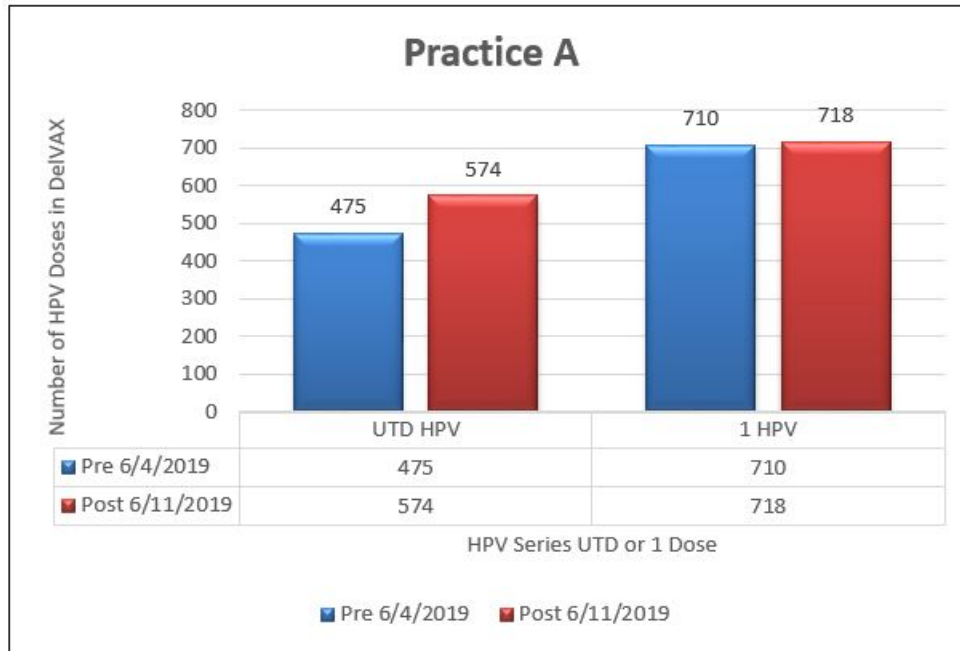
A descriptive analysis was used for this preliminary assessment of outcomes. These efforts yielded an average increase in DelVAX HPV data of 8.1% for one-dose HPV vaccination and 15.5% for UTD HPV vaccination rates for the 13 to 17-year-old cohort over practices engaged for one year. In the following examples, the data and interventions of four practices are summarized.

### Practice A

At Practice A, a data reconciliation pilot was completed where the electronic health record (EHR) data and DelVAX data were compared and corrections made. A total of 200 patient records were reviewed. There were 69 HPV vaccinations added to DelVAX for 51 unique patients. The data reconciliation alone yielded a 12% increase in UTD HPV vaccination rates and a 3% increase in one-dose HPV vaccination rates (Figure 1).

The goal of data reconciliation is to ensure that records in the IIS and EHR match for various reasons: NIS-Teen may switch to using IIS data, to ensure accuracy of IIS data for reporting and use, and to establish accurate baselines. Through this effort, Quality Insights noted that data discrepancies between the IIS and EHR may be due to a move from paper to electronic records, migration to a new EHR, historical records not submitting electronically, and/or contraindications not submitting electronically.

Figure 1. Number of Up-to-Date (UTD) Human Papilloma Virus (HPV) and 1HPV Vaccines Prior to and after Data Reconciliation for Children ages 13 to 17 at Practice A, 2019, Delaware.



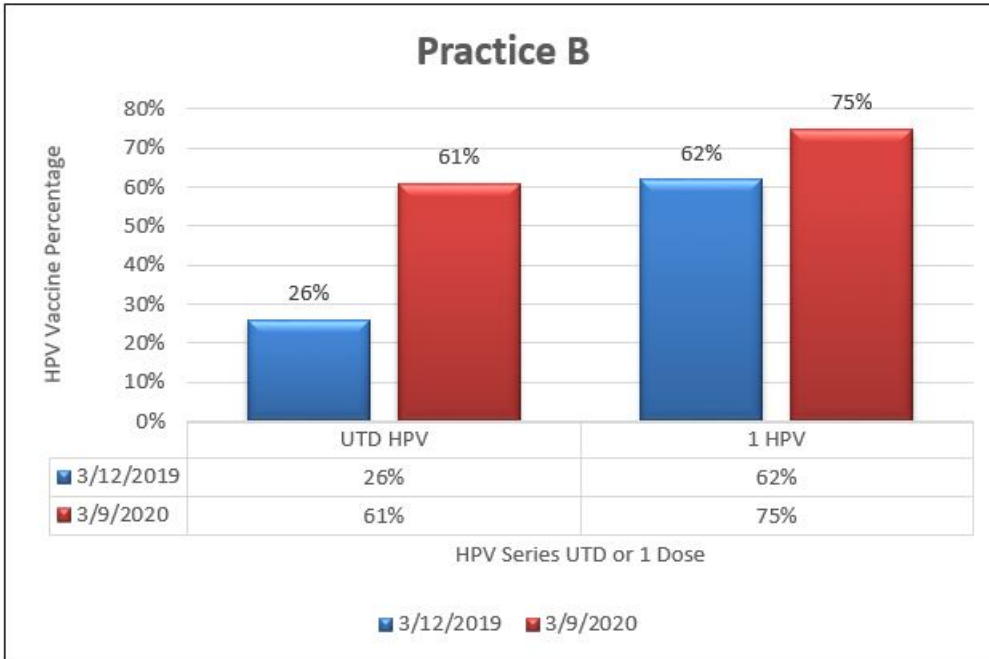
Source: Delaware Immunization Registry, 2019 (DelVAX uses “1 HPV” and “UTD HPV” terminology)<sup>8</sup>

## Practice B

Utilizing a multimodal approach, Practice B increased its rates by 13% for one-dose HPV vaccination and 35% for UTD vaccination in one year (Figure 2). The practice staff was initially trained and a one-on-one session was provided to a newly hired VFC/immunization coordinator. Practice B received four education interventions throughout the year, along with ongoing technical assistance, review of DelVAX reports, vaccination recommendations and workflow recommendations. The current VFC/immunization coordinator began championing HPV vaccination in the practice, engaging the physicians and staff.

Practice B used strategies including DelVAX cleanup and inactivation, immunization goal setting, creating and reviewing DelVAX reports, reminder cards for patients/parents, reminder calls to patients/parents, scheduling next immunization appointments at check-out and physician/staff engagement. The DelVAX reports included AFIX Adolescent and IQIP Adolescent on-demand.

Figure 2. Percentage of Up-to-Date (UTD) Human Papilloma Virus (HPV) and 1HPV Vaccines Given by Practice B to Children Ages 13 to 17, Selected Dates from March 2019 to March 2020, Delaware.



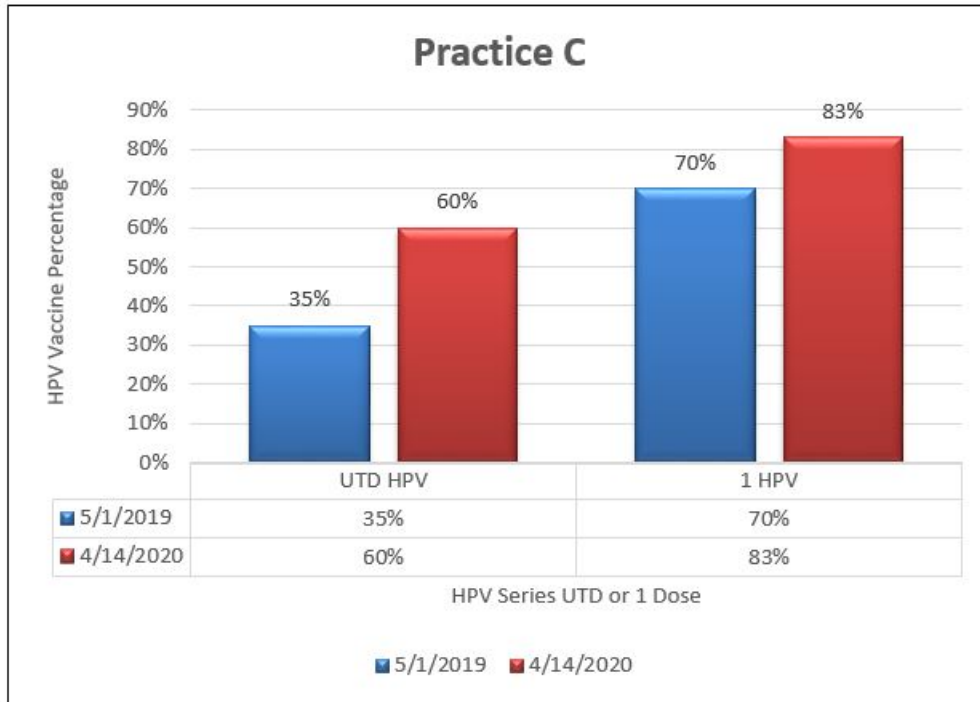
Source: Delaware Immunization Registry, 2019-2020 ((DelVAX uses “1 HPV” and “UTD HPV” terminology)<sup>8</sup>

### Practice C

Practice C demonstrated a 13% increase in its one-dose HPV vaccination rate and a 25% increase in UTD HPV vaccination rate within one year (Figure 3). The practice staff was originally trained, with two one-on-one academic detailing sessions completed for providers. Quality Insights completed a patient reminder campaign for this practice by mailing 31 postcards to patients who were due or overdue for their second or third dose of HPV vaccine. Practice C received four educational sessions throughout the year which included the nurse and nurse practitioner champions, along with ongoing technical assistance, review of DelVAX reports, and vaccination and workflow recommendations.

The practice utilized DelVAX data cleanup, immunization rate goal setting, and additional evidence-based workflow interventions such as strong provider recommendation. The practice is piloting scheduling the nurse visit prior to the patient leaving and performing patient reminders for those visits.

Figure 3. Percentage of Up-to-Date (UTD) Human Papilloma Virus (HPV) and 1HPV Vaccines Given by Practice C to Children Ages 13 to 17, Selected Dates from May 2019 to April 2020, Delaware.



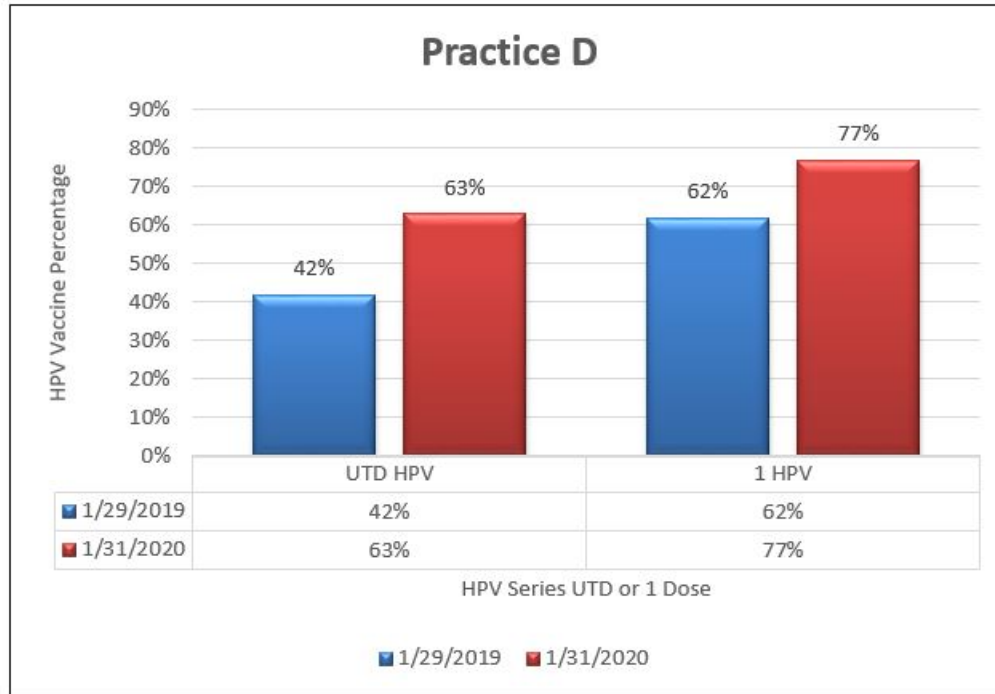
Source: Delaware Immunization Registry, 2019-2020 ((DelVAX uses “1 HPV” and “UTD HPV” terminology)<sup>8</sup>

### Practice D

Practice D demonstrated a 15% increase in its one-dose HPV vaccination rate and a 21% increase in its UTD HPV vaccination rate (Figure 4). The practice staff was trained initially and an academic detailing session was held for the providers. Training was provided for a newly hired immunization/VFC coordinator and data cleanup and patient inactivation was completed. Practice D received six educational interventions throughout the year, along with ongoing technical assistance, review of DelVAX reports, and vaccination and workflow recommendations.

In addition to DelVAX data cleanup, Practice D utilized these strategies: immunization rate goal setting, creating and reviewing reports, scheduling nurse visits at checkout, reminder magnets, increased number of patient-facing materials (posters and handouts), and more diligent recommendation and immunization, especially in the younger cohort.

Figure 4. Percentage of Up-to-Date (UTD) Human Papilloma Virus (HPV) and 1HPV Vaccines Given by Practice D to Children Ages 13 to 17, Selected Dates from January 2019 to January 2020, Delaware.



Source: Delaware Immunization Registry, 2019-2020 ((DelVAX uses “1 HPV” and “UTD HPV” terminology)<sup>8</sup>

## Discussion

Most practices successfully engaged in this project selected more than one evidence-based intervention. While engaged practices used different strategies and workflow modifications, some consistent themes emerged. Practices in which providers were more engaged demonstrated a greater increase in HPV vaccination percentages. Provider engagement manifested in a variety of ways: participation in education and training, championing HPV vaccination, providing strong recommendations for HPV vaccine, answering patient/parental questions, reviewing reports and information from VFC/immunization coordinators, knowing rates of vaccination, and providing early education to patients/parents using multiple methods of delivery (videos, posters, flyers, handouts). Practices showing the greatest increases in HPV vaccination rates also leveraged the information from DelVAX, utilized data cleanup and patient inactivation, set goals, utilized an HPV Vaccination Champion, and employed workflow modifications based on the IIS data and patient population, using a multi-faceted approach. This information is seen in the literature as well.

A literature review, “HPV Vaccination: Population Approaches for Improving Rates,” published in *Human Vaccines and Immunotherapeutics* in June 2016, reviewed various evidence-based workflows to increase HPV vaccination rates, including provider assessment and feedback, provider reminders, and reminder-recall. The review concluded that there was evidence to support the use of both reminder-recall and provider assessment and feedback interventions, with better successes noted from interventions that contain multiple components.<sup>9</sup>

Quality Insights continues to partner with DPH to increase HPV vaccination rates. Currently, Quality Insights is performing data reconciliation for 2,000 patients between the ages of 13 and

17 for a large health system in Delaware. Quality Insights will continue data reconciliation, explore capabilities for e-reminders, and expand training to include strategies for increasing UTD HPV vaccination rates by age 13, and provide support through education, evidence-based interventions, and new DelVAX reports.

### **Disclaimer:**

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