

HPV Vaccine Data and Maps (Heat Maps) Tool

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1. Background

Despite being introduced more than a decade ago, human papillomavirus (HPV) vaccine rates remain far below the national goal. Differences in HPV vaccination rates across the 50 states are widely documented, however, county-specific rates remain largely unavailable. Disaggregating HPV vaccination data to granular geographic resolution (county-level) can be extremely valuable for understanding vaccination disparities.

2. Goals

1. Describe state and county-specific HPV vaccination rates among age-eligible adolescents
2. Illustrate geographic disparities in vaccine uptake
3. Estimate vaccination rates among contemporary adolescent birth cohorts

3. Solutions and Methods

We developed an interactive web-based tool, Hpv vaccinE dATa and Maps (Heat Maps) Tool, for visualizing HPV vaccination rates in urban and rural U.S. counties. Vaccination data of over 10 million adolescents across 50 states was analyzed to estimate HPV vaccination rates (≥ 1 dose) at the national-, state-, and county- (stratified by urban and rural designation) levels. Data from 10 states with universal vaccine purchase policies were excluded. Visualizations were rendered in Tableau and interactivity with webpage was maintained with JavaScript API.

4. Outcomes

Of 10 million adolescents aged 11-15 years, 2.8 million (2.4 million urban and 0.4 million rural) adolescents had complete immunization history available from their 11th birthday. Over one-half (54.3%) of the adolescents in 2020 had received an HPV vaccine dose. Nationally, the rate was 8.8 percentage points higher for urban counties ($P < .001$). State averages exceeded 70 percent for Maryland, Delaware, Nebraska, and Tennessee, but were under 30 percent in Mississippi, North Dakota, New Jersey, and Oklahoma. In most states, urban counties had higher HPV vaccination rates; the urban-rural difference exceeded 25 percentage points in Utah, Missouri, Nevada, Montana, and Illinois. Rates varied from 1.7 percent in Benson County (North Dakota) to 90.9 percent in Brooks County (Texas).

5. Lessons Learned and Future Directions

The visualization tool was high effective for illustrating disaggregated HPV vaccination data and revealed substantial urban-rural vaccination disparities across the nation. Interventions to mitigate these geographic disparities in the contemporary generations of adolescents are urgently needed to prevent the morbidity and mortality burden of HPV-associated cancers.

Figure

 HPV VACCINE
DATA AND MAPS

