



*Missed Opportunity:*

HPV

# Human Papillomavirus Vaccination

*in Texas*

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A population health data brief from  
The University of Texas System  
**Office of Health Affairs**

## Vaccination for Cancer Prevention

In the 1980s, the connection between human papillomavirus (HPV) and cervical cancer was established. We now know that HPV is responsible for many other types of cancers impacting both women and men. In addition to causing almost all cervical cancers, HPV also causes:<sup>1</sup>

- 35%** of penile cancers
- 50%** of vulvar cancers
- 65%** of vaginal cancers
- 70%** of oropharyngeal cancers (cancers of the middle part of the throat, including the soft palate, the base of the tongue, and the tonsils)
- 95%** of anal cancers

In the U.S., HPV-associated cancers make up approximately 3% of all cancer cases among women and 2% of all cancer cases among men.<sup>2</sup> In Texas, there were 2,801 HPV-associated cancers (1,713 in women and 1,088 in men) in the five year period 2009-2013.<sup>3</sup>

HPV is transmitted primarily through sexual contact, including vaginal, anal or oral sex. Some studies suggest that HPV may be passed on via open-mouthed kissing. Less commonly, HPV can be transmitted from mother to child during childbirth.

While sexually transmitted HPV infections are common and most resolve on their own without symptoms, some HPV infections persist and can cause disease. Low-risk HPV types can cause skin warts on or around the genitals. High-risk HPV types can, over time, lead to cancer. Two high-risk types, HPV 16 and 18, are responsible for most HPV-associated cancers.

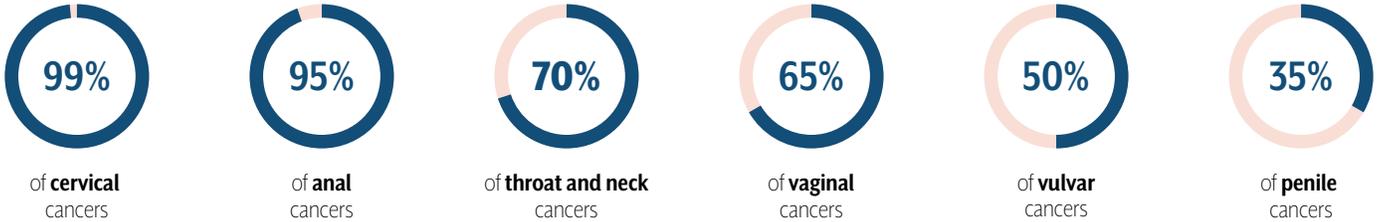
HPV vaccines have made possible the prevention of HPV-associated cancers in both men and women. The three currently available HPV vaccines—Cervarix®, Gardasil®, and Gardasil® 9—offer protection from the HPV types most closely linked to cancer. As with all vaccines, HPV vaccines were put through extensive safety testing prior to licensure by the U.S. Food and Drug Administration, and are continually monitored for safety. Over 270 million doses of HPV vaccines have been given globally over more than a decade, and these vaccines have been shown to be safe and highly effective at preventing HPV.<sup>4</sup>

In 2007, Australia became one of the first countries to establish a nationally funded, school-based HPV vaccination program. Australia's ongoing vaccination program offers free HPV vaccines for girls ages 12-13 years and catch-up vaccines for women under age 26. In the two years after the program began, diagnoses of genital warts among young women ages 12-27 declined by 59 percent! A similar pattern was seen in young men – in effect, HPV immunity in females was helping to protect males. In 2013, the Australian government began including boys in the school-based HPV vaccination program. Because HPV-associated cancers typically take decades to develop, it



THE HPV  
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VACCINE

## HPV is associated with



is too soon to measure impact on cancers. However, dramatic declines in relevant pre-cancers have been documented in Australia as well as several other countries that have adopted national HPV vaccine programs.<sup>5</sup>

In the U.S., the Centers for Disease Control and Prevention (CDC) Advisory Committee on Immunization Practice has recommended routine HPV vaccination at ages 11 or 12 years for all adolescents since 2011 (and for females since 2006). Healthy People 2020 has established a target of 80% of all adolescents to have received the recommended number of HPV vaccine doses by age 13 to 15 years.<sup>6</sup>

### HPV Vaccination: How is Texas Doing?

This report uses data from the National Immunization Survey-Teen (NIS-Teen) survey to look at HPV vaccination coverage for 13-17 year olds in Texas and select areas within the state.<sup>7</sup> NIS-Teen is a random digit dialing telephone survey of households in the U.S. plus provider-reported vaccination histories of teens whose parents participate in the phone survey and consent to having their teen's vaccination providers contacted. The 2016 survey provides estimates of adolescent vaccination coverage in all 50 states and the District of Columbia, as well as a small number of local areas, including Dallas, Bexar, and El Paso Counties and the City of Houston.\*

This document provides estimates of HPV vaccination coverage using two different measures: 1) the percentage of adolescents who have received at least one dose of HPV vaccine (a more inclusive measure), and the percentage of adolescents who are up-to-date on their HPV vaccination (i.e., have received the recommended number of doses for their age). Adolescents are considered up-to-date if they had received at least three doses, or if they received two doses and the first dose was received before age 15 years.

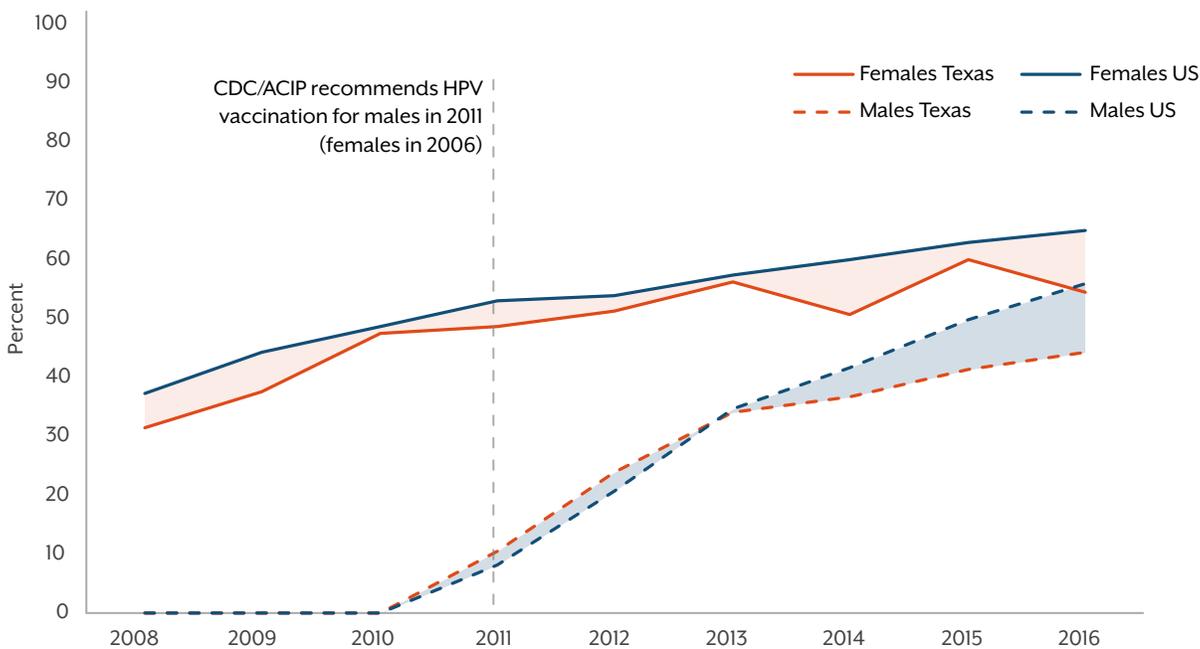
\* Starting in 2007, state immunization programs could choose city/county areas of interest to have a sample design that ensured adequate sample size to produce estimates for the area, using their grant funds. Additional information and 2016 HPV vaccination data can be found at: <https://www.cdc.gov/vaccines/imz-managers/coverage/teenvaxview/data-reports/hpv/dashboard/2016.html>

## Texas has fallen behind

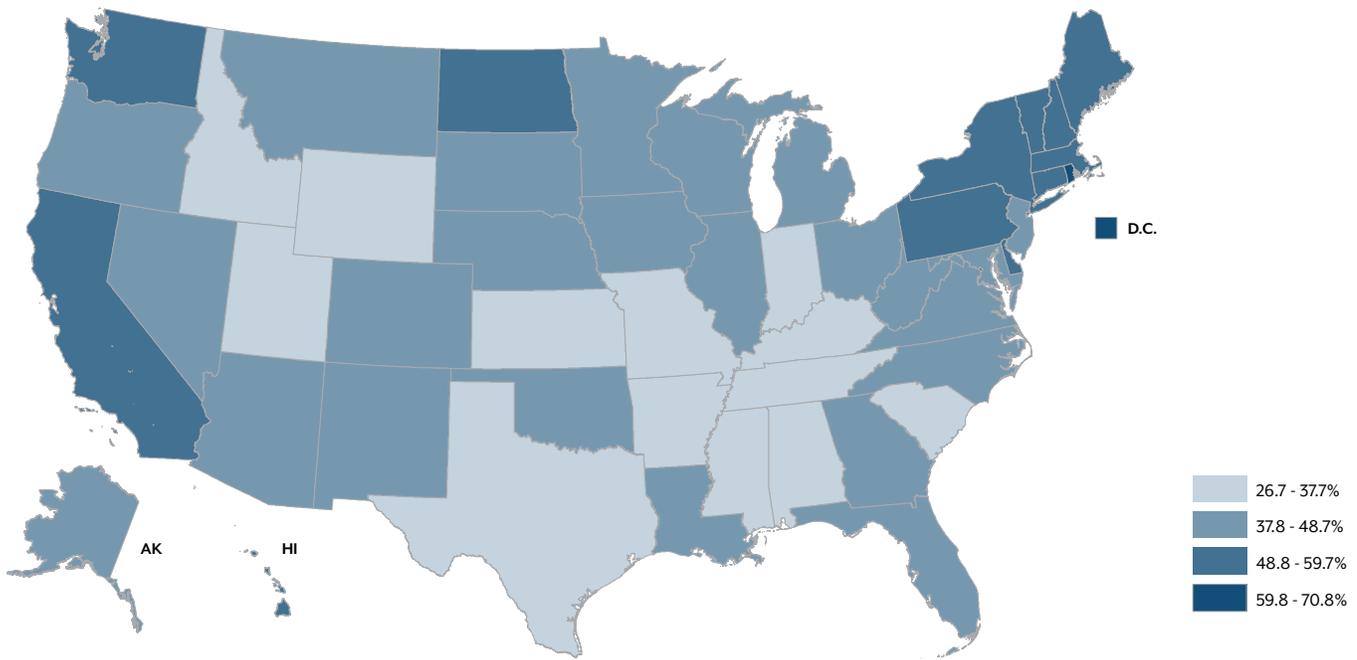
Despite the remarkable cancer prevention opportunity HPV vaccination provides, Texas has fallen behind the rest of the country in adopting this practice (Fig. 1). In 2013, the proportion of adolescents in Texas who had received at least one HPV vaccine dose was similar to that of the U.S. adolescent population overall. Yet in 2016, the estimated proportion of Texas adolescents who had received at least one dose of HPV vaccine was 10.6 percentage points lower for females and 11.7 percentage points lower for males, compared to the U.S. overall.

In 2016, fewer than half (49.3%) of Texas adolescents ages 13-17 years old had received at least one HPV vaccine and just one-third (32.9%; 39.7% of females; 26.5% of males) were up-to-date on HPV vaccinations. HPV vaccination coverage in Texas is not only below average in the country, it trails behind that of almost every other state (Fig. 2). Only four states – Wyoming, Mississippi, South Carolina, and Utah – had an up-to-date HPV vaccination coverage level lower than that of Texas.

The relatively low HPV vaccination coverage in Texas cannot be explained by a general reluctance among Texas parents to vaccinate their children. NIS-Teen data indicate that coverage in Texas for other adolescent vaccinations – tetanus, diphtheria, and acellular pertussis vaccine (Tdap), and meningococcal conjugate vaccine (MenACWY) – were 85.0% and 85.5%, respectively. These coverage estimates were similar to those in the U.S. overall (Fig. 3).

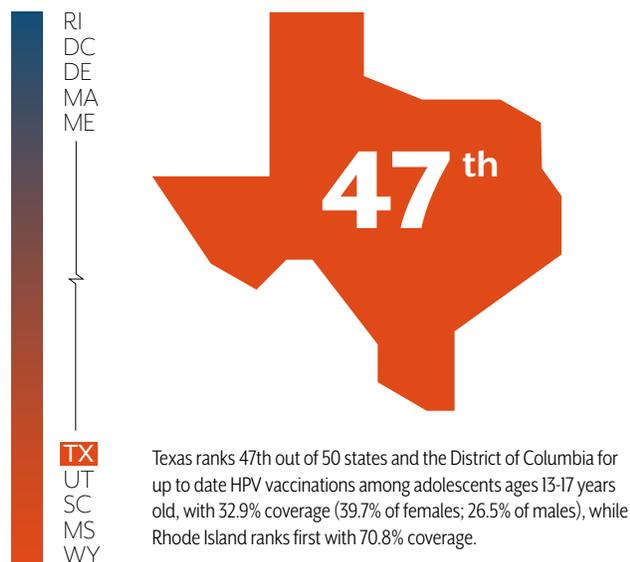


**Fig. 1.** Estimated ≥1 dose HPV vaccination coverage among adolescents aged 13-17 years in Texas and the United States – National Immunization Survey-Teen (NIS-Teen), 2008-2016



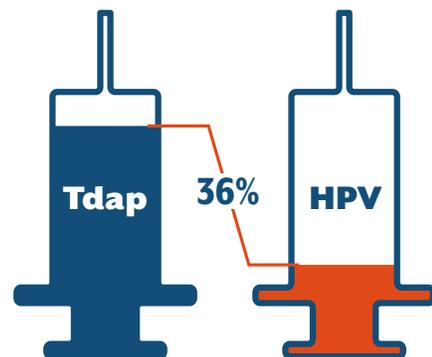
**Fig. 2.** Estimated up-to-date HPV vaccination coverage among adolescents aged 13-17 years by state — National Immunization Survey-Teen (NIS-Teen), 2016

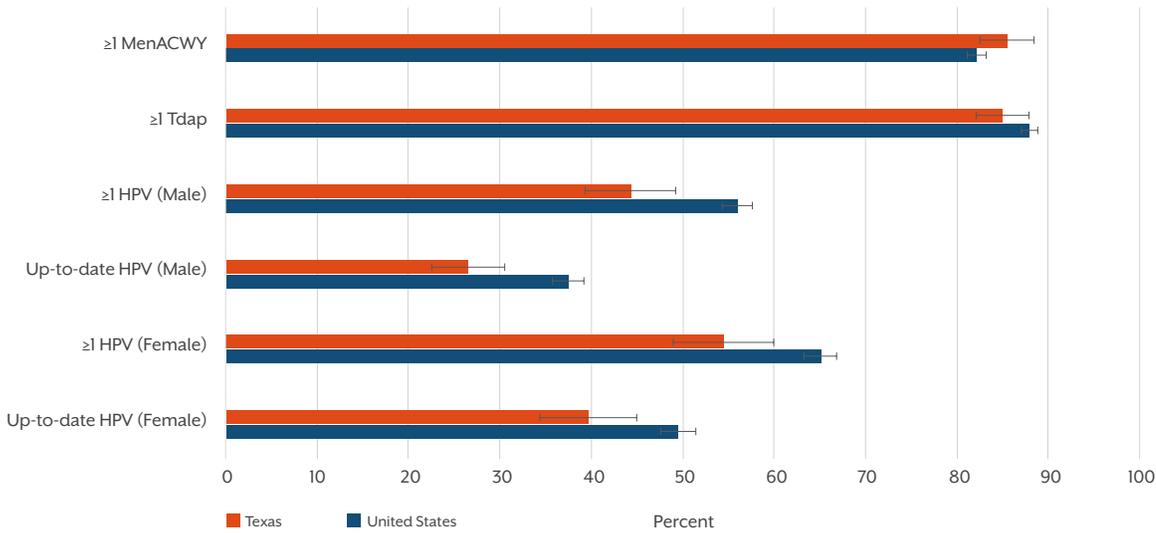
In 2016, the proportion of adolescents who received at least one HPV vaccination was 36 percentage points lower than the proportion that received the other recommended adolescent vaccines. The gap between uptake of HPV vaccine and that of other adolescent vaccines represents a tremendous missed opportunity to protect adolescents against future cancer by vaccinating them against HPV at the same visit when other vaccines are administered.



## THE TEXAS “VACCINATION GAP”

36 percentage points difference between HPV vaccination and other recommended adolescent vaccines.



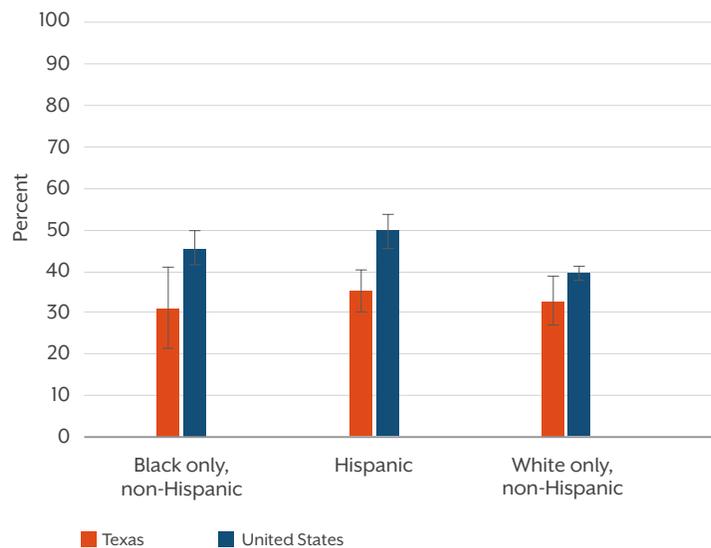


**Fig. 3.** Estimated vaccination coverage among adolescents aged 13–17 years – National Immunization Survey-Teen (NIS-Teen), United States and Texas, 2016

*Error bars represent 95% confidence intervals*

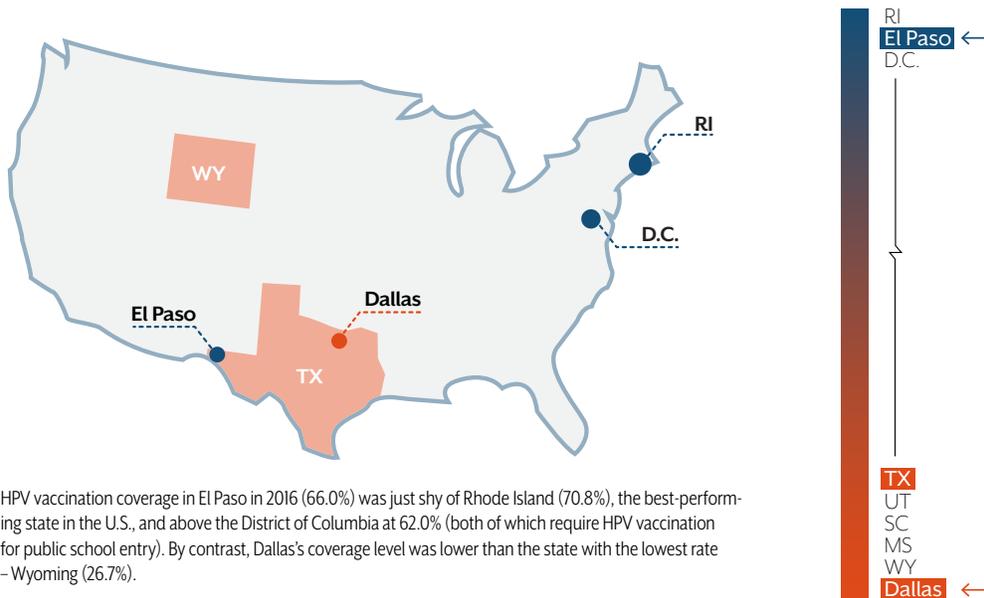
## Patterns of HPV vaccination coverage in Texas

While in the U.S. in 2016, blacks and Hispanics had higher up-to-date HPV vaccine coverage than whites, coverage did not significantly differ by race/ethnicity in Texas (Fig. 4). In both Texas and in the U.S., males were less likely than females to be vaccinated against HPV (Fig. 3), though the gap appears to be narrowing (Fig. 1). Differences in HPV vaccination coverage between more urban and less urban areas in Texas, although not statistically significant, showed a similar pattern to that seen in the U.S., where those living in more urban areas were more likely to be up-to-date in HPV vaccinations than those living in less urban areas (Fig. 5).



**Fig. 4.** Estimated up-to-date HPV vaccination coverage among adolescents aged 13–17 years by race/ethnicity in Texas – National Immunization Survey-Teen (NIS-Teen), 2016

*Error bars represent 95% confidence intervals*



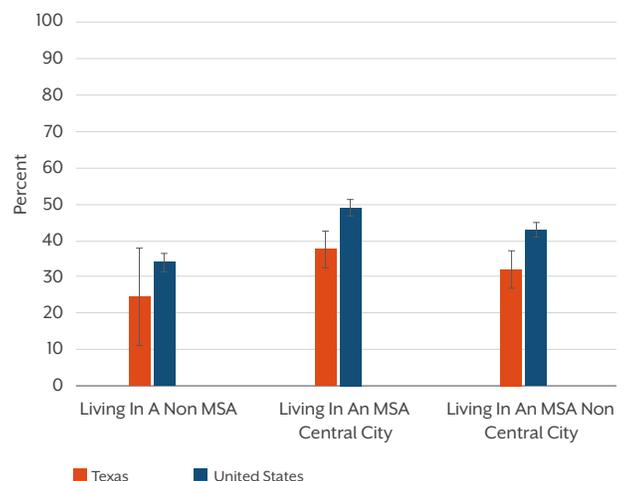
## El Paso: The bright spot in Texas HPV vaccination coverage

While at the state level, Texas HPV vaccine coverage levels are among the lowest in the nation, coverage varies across the state. In 2016, estimates of adolescent up-to-date HPV vaccination coverage for local areas included in the NIS-Teen survey ranged from a high of 66.0% in El Paso County to a low of 23.9% in Dallas County (Fig. 6). HPV vaccination coverage in El Paso in 2016 was just below that of the best-performing state in the U.S. – Rhode Island, with up-to-date coverage of 70.8%. By contrast, Dallas's coverage level was lower than that of the state with the lowest rate – Wyoming (26.7%).

## Usefulness and Limitations of NIS-Teen data for understanding HPV vaccination in Texas

The NIS-Teen survey was developed by the CDC in 2006 to monitor national health status indicators and vaccination coverage estimates for adolescents ages 13-17 years. As highlighted in this report, the NIS-Teen survey provides estimates of vaccination coverage at the national and state levels, and a few select areas within Texas. This information shows how Texas compares to other states, and allows investigation of differences by gender and race/ethnicity within states.

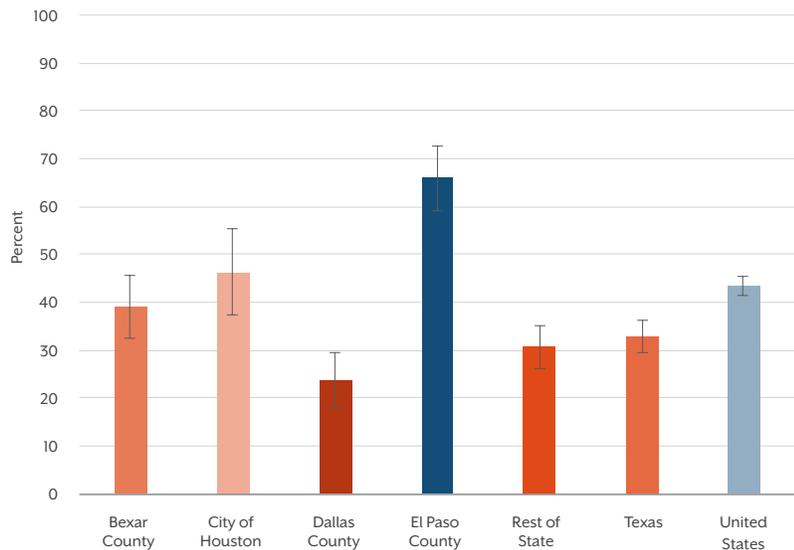
However, as a tool for local communities to benchmark and track progress towards HPV vaccination, the NIS-Teen survey is extremely limited. Only a handful of local areas are included in the survey sampling design each year and in some cases, these areas are not included every year. For example, Dallas was included in 2009 and 2010, but was not included in the NIS-Teen survey again until 2016. Ideally, all major metropolitan areas in the country would be consistently included in the NIS-Teen survey. And in addition to the NIS-Teen survey, other data sources are needed to allow all communities to benchmark their HPV vaccination coverage levels, target interventions, and track progress.



**Fig. 5.** Estimated up-to-date HPV vaccination coverage among adolescents aged 13-17 years by urbanicity in Texas – National Immunization Survey-Teen (NIS-Teen), 2016

MSA = Metropolitan Statistical Area. An MSA must have at least one urbanized area of 50,000 or more inhabitants, as defined by the United States Office of Management and Budget.

Error bars represent 95% confidence intervals



**Fig. 6.** Estimated up-to-date HPV vaccination coverage among adolescents aged 13-17 years in select areas within Texas, Texas, and United States – National Immunization Survey-Teen (NIS-Teen), 2016

*Error bars represent 95% confidence intervals*

## Conclusion and Public Health Implications

HPV vaccination provides the opportunity to prevent many cancers in both men and women. The data provided in this report indicate that in Texas:

- Adolescents are less likely than their peers in other states to have been vaccinated against HPV, but similarly likely to have received other adolescent vaccines. In 2016, the proportion of adolescents who received at least one HPV vaccination was 36 percentage points lower than the proportion that received the other recommended adolescent vaccines.
- Substantial variation in HPV vaccination coverage exists across the state. El Paso's HPV vaccine coverage level is on par with states with the highest coverage levels, while coverage in Dallas is below that of all other states. Data suggest that rural areas may have lower coverage than urban areas.

To accelerate progress on HPV vaccination in Texas, effort should be undertaken to:

- Encourage provision of HPV vaccine at the same visit when other adolescent vaccines are given. Closing the gap between HPV and other adolescent vaccines would substantially boost HPV vaccine coverage.
- Develop evidence-based and targeted strategies to reach males and rural populations, and to increase HPV vaccination in the Dallas area.
- Document the factors that contributed to El Paso's strong HPV immunization record

and apply what we learn to help increase HPV vaccination elsewhere in the state.

- Include all major metropolitan areas of Texas in the annual NIS-Teen survey.
- Improve the accuracy, completeness and availability of data on HPV vaccination to enable providers and communities to effectively target resources, benchmark coverage, and assess progress towards improved coverage.

Much is known about how to increase HPV vaccination coverage in a variety of settings, and El Paso has demonstrated that this is achievable in Texas. With the right data, investments, and partnerships, we can eliminate the missed opportunity to prevent HPV-associated cancers in Texas.

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