

Variations in Human Papillomavirus Vaccination and Human Papillomavirus Related Cancer Rates in Texas, United States

Victor Adekanmbi MD, PhD^{1,2}, Itunu Sokale, MD, DrPH^{3,4}, Fangjian Guo MD, PhD^{1,2}, Christine D. Hsu PharmD, PhD^{1,2}, Jessica NgoBSc⁵,

Thao Huang MSc⁶, Abiodun Oluyomi PhD^{3,4}, Abbey B. Berenson MD, PhD^{1,2}

¹Center for Interdisciplinary Research in Women's Health, School of Medicine, The University of Texas Medical Branch, Galveston, TX, USA*

²Department of Obstetrics and Gynecology, The University of Texas Medical Branch, Galveston, TX, USA.

³Department of Medicine, Section of Epidemiology and Population Sciences, Baylor College of Medicine, Houston, TX, USA*

⁴Dan L. Duncan Comprehensive Cancer Center, Baylor College of Medicine, Houston, TX, USA*

⁵School of Medicine, The University of Texas Medical Branch, Galveston, TX, USA*

⁶Institute for Translational Sciences, The University of Texas Medical Branch, Galveston, TX, USA*



Background

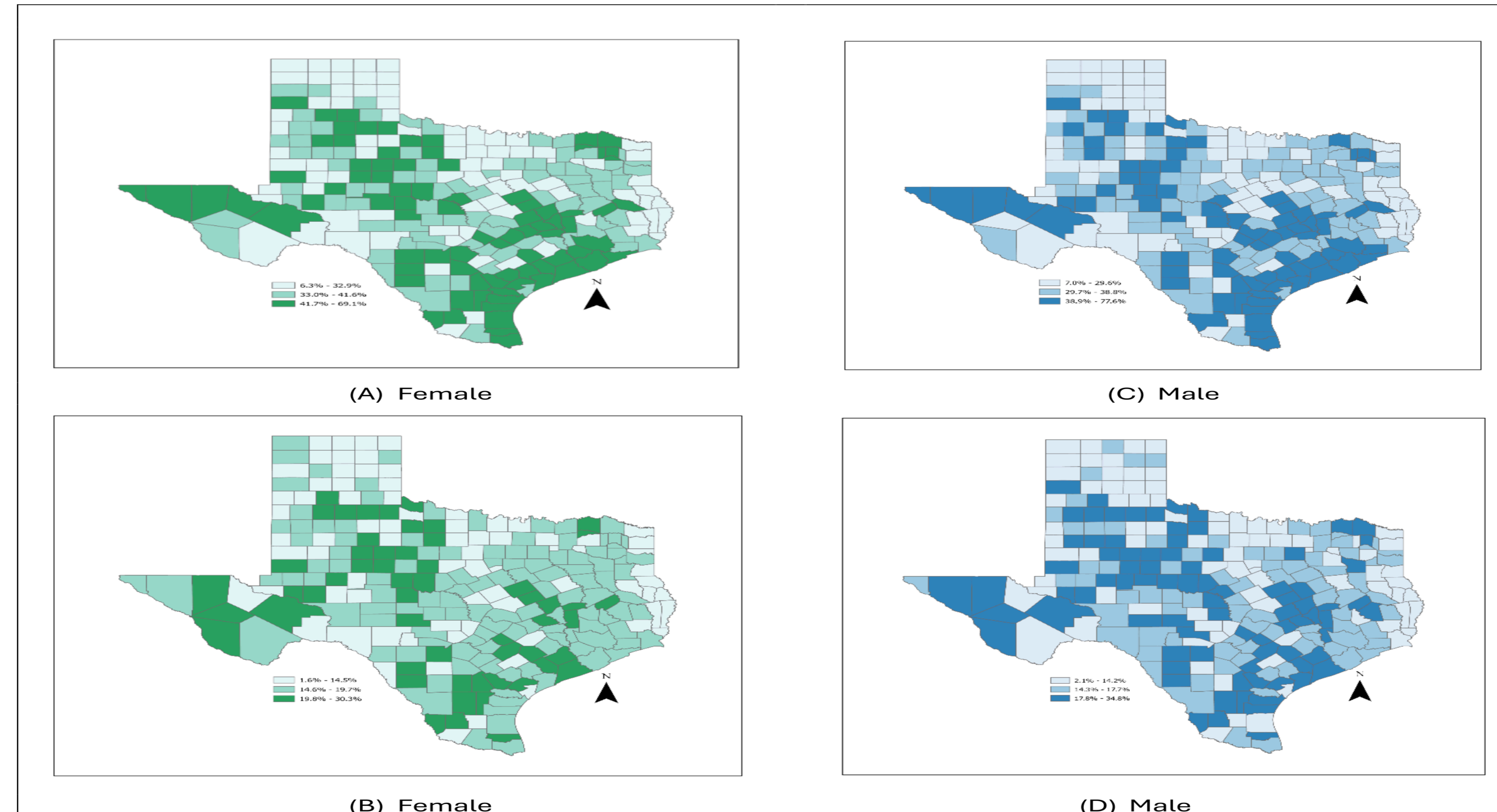
To inform the design and implementation of targeted interventions to reduce future burden of human papillomavirus (HPV)-related cancers in Texas, we estimated county-level (i) proportion of individuals aged 9–17 years who received at least 1 dose (initiated) and 2 or 3 doses (up-to-date) of HPV vaccination series and (ii) HPV-related cancer incidence rates (IRs). The main aims of this study were to (i) identify which Texas counties have low and high HPV vaccination uptake and up-to-date rates (ii) identify which counties have the highest and lowest risks of HPV-related cancers with a view to inform targeted interventions.

Methods

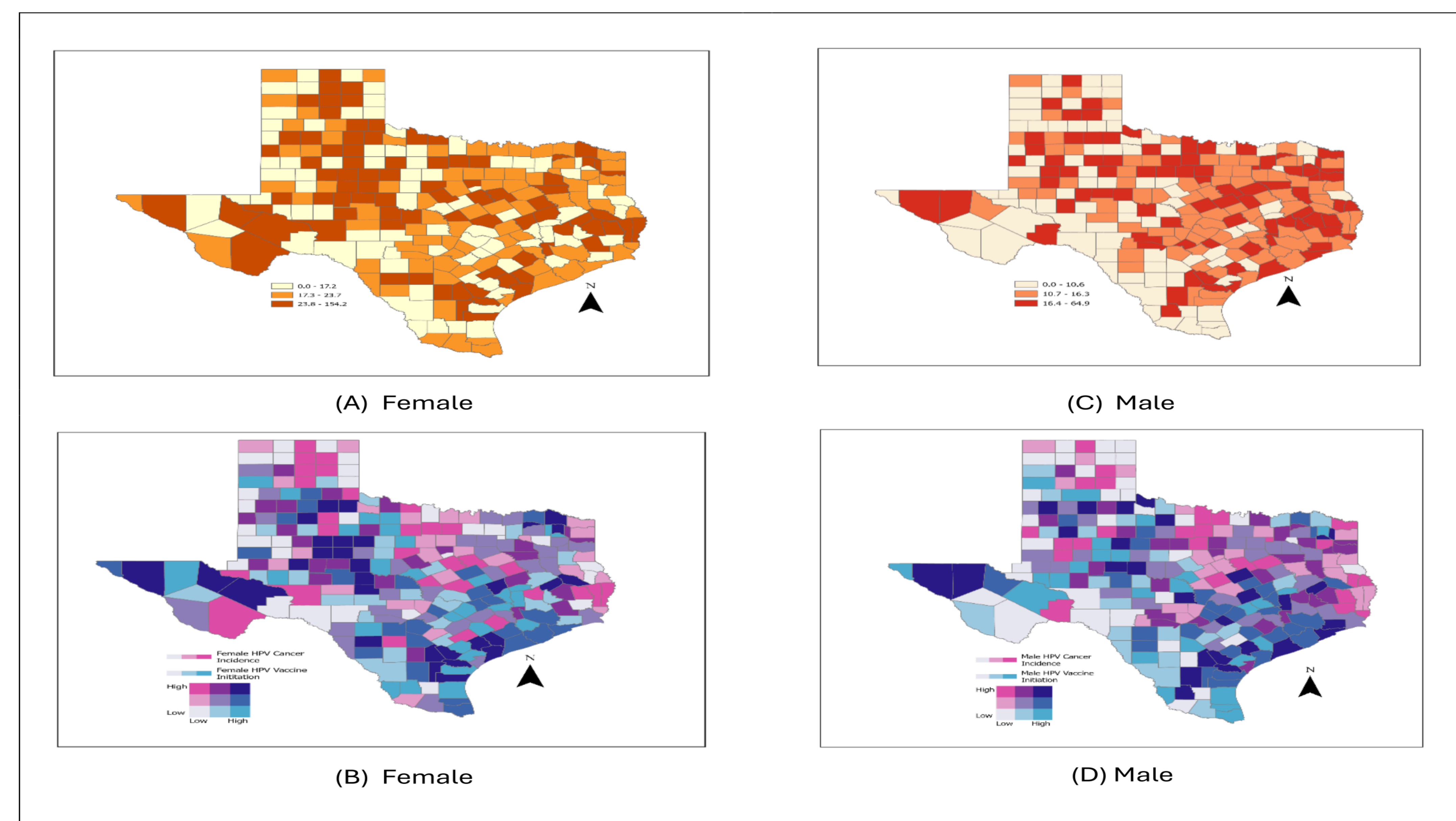
In this population-based cross-sectional study, we analyzed the available data by county, and year to examine rates of HPV vaccination series initiation/up-to date, and HPV-related cancers. We used the direct method to estimate the mean yearly age-adjusted HPV-related cancer incidence rates (IRs). We applied the mean annual HPV-related cancer IR derived from years 2016-2020 to the US 2000 standard population weights to obtain our mean annual age-adjusted cancer IRs. For assessment of geospatial patterns of the HPV metrics of interest through univariate mapping, HPV vaccination series initiation, up-to-date status and HPV-related cancer county rates were divided into terciles. Each tercile was color coded with increasingly darker colors indicating enhanced risk of HPV-related cancers. Bivariate choropleth maps were thereafter generated to show concurrent county-level HPV vaccine initiation prevalence and HPV-related cancer IR for each sex, where 3 terciles of HPV vaccine initiation and 3 terciles of HPV-related cancers were separated into 9 values.

HPV vaccination and HPV Related Cancer Rates in Texas

Terciles of the percentage of individuals aged 9–17 years who initiated (A and C) or had up-to-date (B and D) HPV vaccination series in 2021 and 2022.



HPV-related cancer incidence rate among (A) females and (C) males from 2016–2020 and terciles of annual age-adjusted HPV-related cancers incidence (2016–2020) and HPV vaccination initiation among (B) female and (D) male (2021–2022)



Results

The mean 2021–2022 county-level HPV vaccination series initiation estimates ranged from 6.2% to 59.1% for females and from 6.9% to 57.6% for males among individuals aged 9–17 years. County-level vaccination up-to-date estimates was generally lower compared to that of initiation and ranged from 1.6% to 26.9% for females and from 2.1% to 34.9% for males. The age-adjusted annual HPV-related cancer IR by county for years 2016–2020 ranged from 0 to 154.2 per 100,000 for females and from 0 to 60.1 per 100,000 for males. The counties in the north region have a higher IR of HPV-related cancers and lower proportion of HPV vaccination than other regions.

Conclusions

Incidence of HPV-related cancers varied widely across Texas counties. The counties in the northern region of Texas had a higher IR of HPV-related cancers and lower HPV vaccination rates. Targeted interventions to increase uptake and completion of the HPV vaccination series across counties with low HPV vaccination initiation and up-to-date status may help further reduce the future burden of HPV-related cancers.

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