

Effect of Geographical Location on HPV Vaccination in Mississippi

J. Scott Ross, PharmD; Anna K Ward, PharmD; Natasha Lewis, PharmD
Mississippi State Department of Health Pharmacy

INTRODUCTION & BACKGROUND

Human papillomavirus (HPV) is one of the most common sexually transmitted infections in the US, with 85% of people becoming infected with HPV at some point in their life. In most cases, the HPV infection will clear on its own. In some cases, though, the infection remains and can lead to genital warts or cancer (including cervical and oropharyngeal cancer).^{1,2} Based on Centers for Disease Control and Prevention (CDC) statistics from 2013 to 2017, HPV was thought to contribute to >90% of anal and cervical cancers, >70% of vaginal and vulvar cancers, and >60% of penile cancers.²

In Mississippi (MS), the HPV vaccine is currently recommended, but not required, to be given routinely to all adolescents 11 to 12 years old, along with the tetanus, diphtheria, and acellular pertussis (Tdap) (required in MS schools) and meningococcal vaccines.³ If not given routinely, it is recommended for anyone age 9 to 26 years old to receive the HPV vaccine.⁴ The HPV vaccine is highly effective in preventing HPV infections and associated cancers.

When comparing U.S. HPV infection rates between 2003-2006 and 2015-2018, the infection rate of HPV strains that cause most HPV cancers and genital warts have decreased by 88% in females 14 to 19 years old and 81% in females 20 to 24 years old.⁵ Estimates suggest that the HPV vaccine could prevent around 33,000 cancer cases per year.¹

In 2019, MS had the lowest HPV vaccination rate in the U.S. with only 24.5% of adolescents 13 to 15 years old up-to-date and 30.5% of adolescents 13 to 17 years old up-to-date, compared to the U.S. average of 52.3% and 54.2%, respectively.⁶ From 2013 to 2017, MS ranked 4th in cervical cancer incidence and 3rd in cervical cancer mortality; and 5th in oropharyngeal cancer incidence and 1st in oropharyngeal cancer mortality.⁷ Low vaccination rates and high cancer incidence and mortality underscore the need to increase HPV vaccination in MS.

Previous studies have identified potential barriers to HPV vaccination, including living in the Southern region, living in a conservative state, living in highly religious areas of the U.S., living in states that do not require sex education, living in a state that does not mandate the HPV vaccine, living in a state with high poverty levels, and living in areas with provider shortages.^{8,9} Also, a recent survey identified the most common barriers that prevented parents from vaccinating their children: perceived safety issues, perceived lack of necessity, lack of knowledge about the vaccine, lack of provider recommendation, and assuming the child not sexually active.¹⁰

OBJECTIVES

The primary objective of this study is to determine the effect of geographical location on the rates of HPV vaccination in MS. The secondary objective of this study is to compare HPV vaccination rates by provider type in private sector clinics vs public sector clinics (e.g., county health departments). The data collected in this study will allow the Mississippi State Department of Health to identify areas in the state that require more attention regarding HPV vaccination efforts.

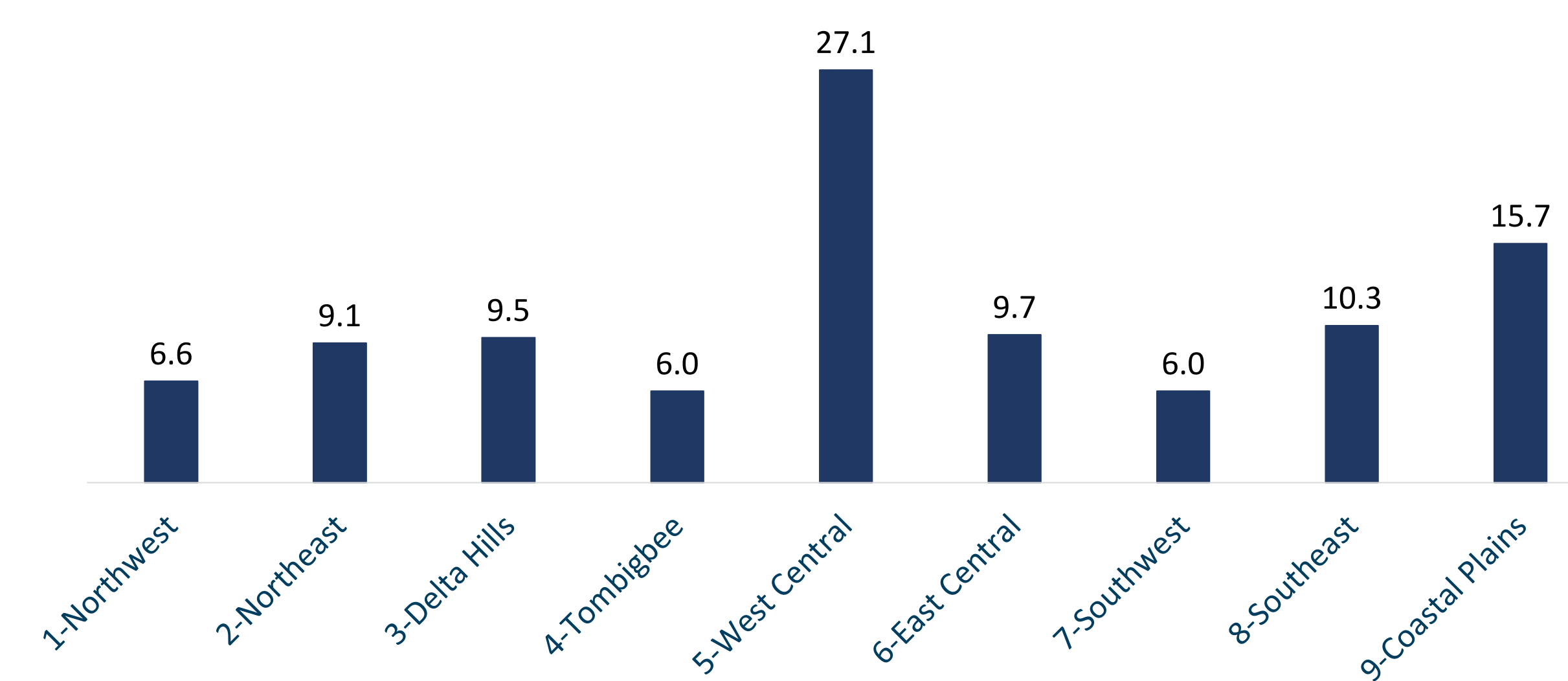
METHODS

This study is a descriptive and inferential analysis using vaccination data from the Mississippi Immunization Information eXchange (MIIX) database. We obtained vaccination data from MIIX on adolescents between 11 and 17 years who reside in the state of Mississippi and received one or more HPV vaccinations between 2015 and 2019.

FINDINGS

Between 2015-2019, 251,854 HPV vaccinations were administered to 146,110 youth between the ages of 11-17 years for whom we had information on county of residence. See Figures 1, 3. County of residence was missing on 19,923 records.

Figure 1. Percent of Youth 11-17 Years Who Received at Least 1 HPV Vaccination by Health District of Residence, MIIX 2015-2019



Between 2015-2019, 56% of youth 11-17 years received only one HPV vaccination, 33% received two, and 11% received three or more. Period data for up-to-date vaccination varied significantly by provider type (Wald $\chi^2 < 0.0001$) and youth's health district of residence (Wald $\chi^2 < 0.0001$).

The most common providers of HPV vaccinations to 11-17 year old youth were pediatricians, county health departments, primary/family care providers, and federally qualified health centers. Figure 2. Provider type varied significantly by the youth's health district of residence (MH $\chi^2 < 0.0001$). While the use of a retail pharmacy for HPV vaccination was low, 33% of the pharmacy-based vaccinations occurred in the West Central health district and 21% occurred in the Northeast health district. Pediatricians were the most common HPV vaccination site in every health district except in the Delta Hills and the East Central health districts where primary care was relied on more heavily. County health departments were the second most common vaccination site in the Northeast, Tombigbee, East Central, Southwest, Southeast, and Coastal Plains health districts.

Figure 2. Vaccine Provider Type (%) of Youth 11-17 Years, MIIX 2015-2019

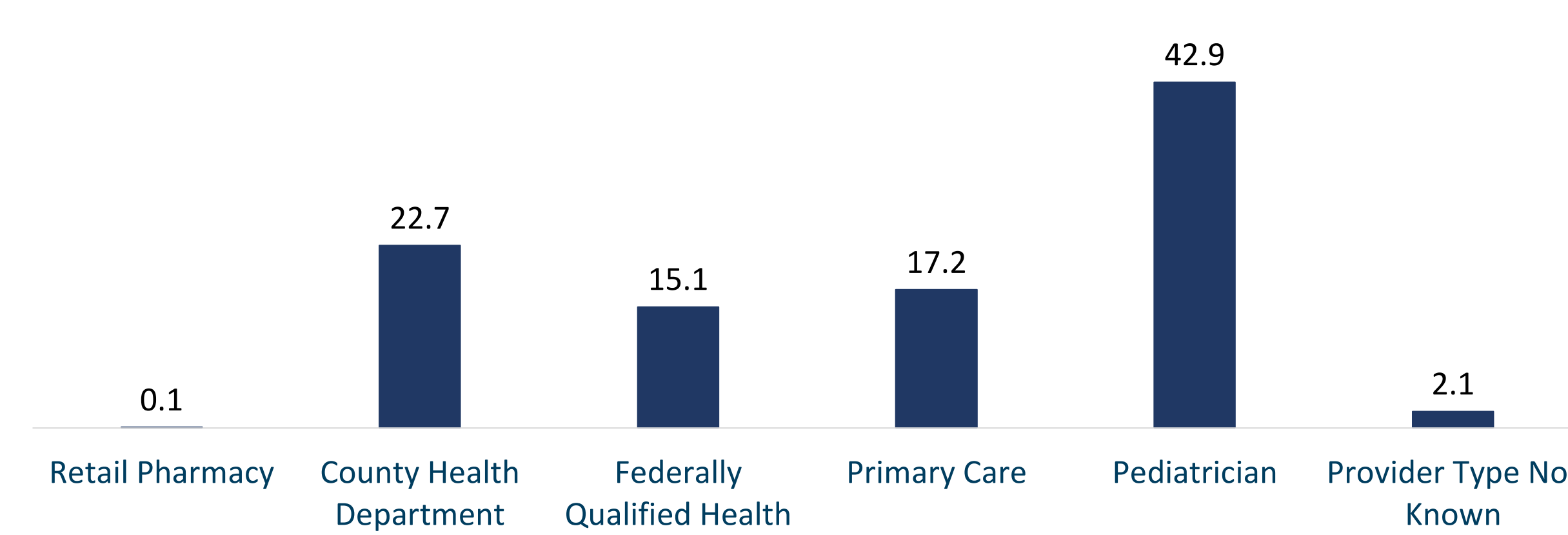
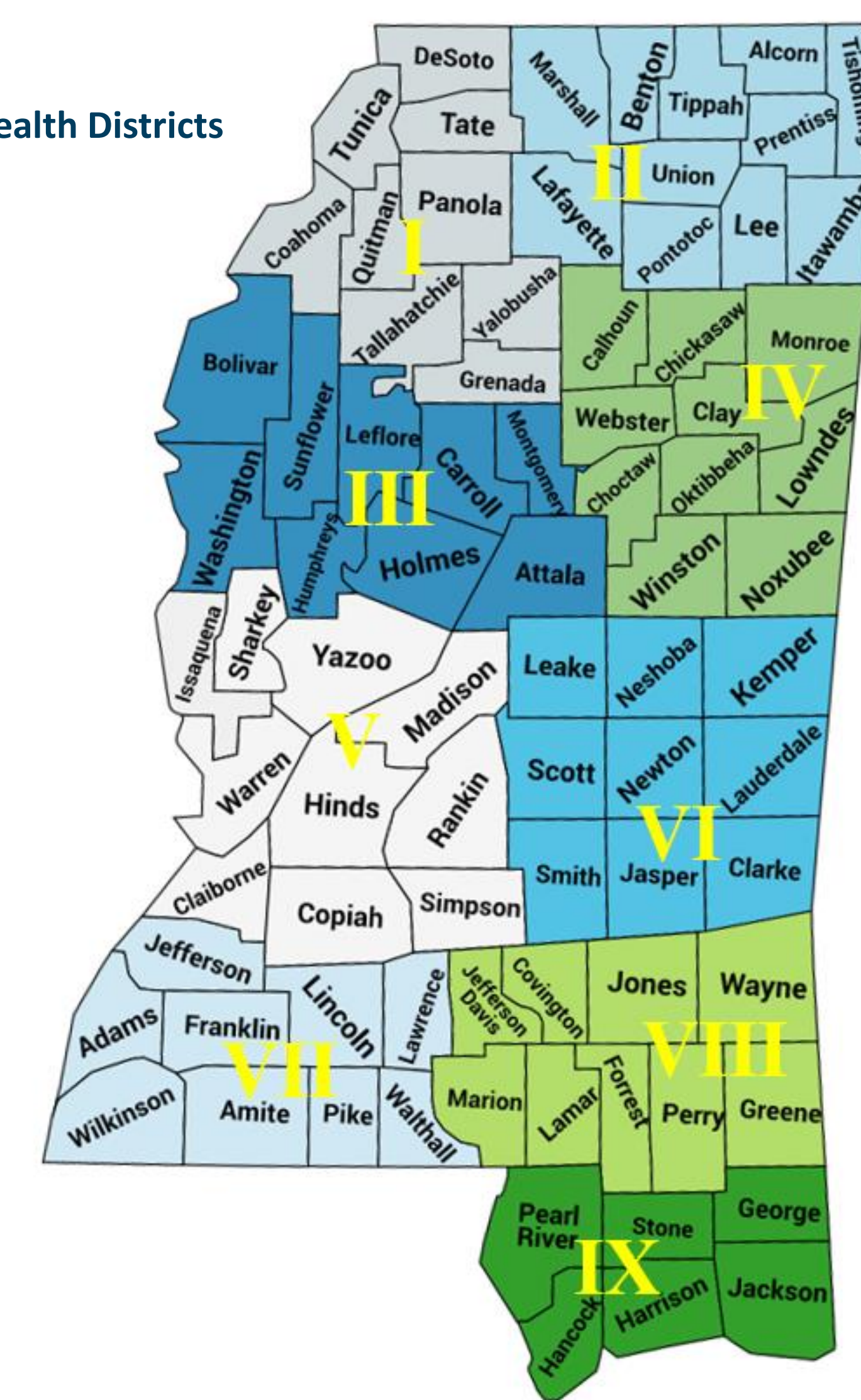


Figure 3. Mississippi Health Districts



RESULTS/CONCLUSIONS

Results and conclusions of this study are pending. We hypothesize that rural areas with less healthcare access will have lower HPV vaccination rates, public sector clinics will have higher HPV vaccination rate. Additional logistic regression and multi-level regression analyses will be conducted to better assess completion of vaccination series and vaccination by provider type and youth residence.

IMPLICATIONS

The data collected in this study will allow the Mississippi State Department of Health to identify areas within the state that require more attention regarding HPV vaccination efforts.

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