

HPV VACCINE SERIES COMPLETION RATES AMONG MISSISSIPPI MEDICAID BENEFICIARIES WHO INITIATED VACCINATION SERIES JAN 1, 2017 – DEC 31, 2017

BACKGROUND

Human Papillomaviruses (HPV) is the most common sexually-transmitted infection in the United States affecting over 79 million Americans. HPVs are a group of more than 150 viruses, most commonly affecting adults and those in their late teens. HPV causes genital warts and certain cancers (cervical, vulvar, vaginal, penile, anal, and oropharyngeal).¹ It is estimated that 79% of HPV-associated cancers can be attributed to the virus.² The incidence rate of HPV-associated cancers in Mississippi was estimated as 14.3 per 100,000 persons, which is higher than the United States national average of 11.7 per 100,000 persons.³

Three vaccines, Gardasil® (4vHPV), Cervarix® (2vHPV) and Gardasil®9 (9vHPV) were licensed by the Food and Drug Administration (FDA) for immunization against HPV. As of 2017, Gardasil®9 is the only vaccine available in the United States.⁴ The American Council on Immunization Practices (ACIP) recommends initiation of the HPV vaccination series in both males and females at ages 11 to 12 years. Vaccine initiation can occur, though, as early as 9 years of age. Multiple updates to the recommended HPV vaccination schedule have occurred over time. A timeline summary of substantial changes recommended by ACIP for HPV vaccination schedule is provided below:

- **Prior to 2016** - a 3-dose vaccination schedule within a period of 12 months was recommended irrespective of age at initiation.^{5,6}
- **December 2016** - two doses are recommended for children who initiate vaccination before age 15 years and three doses are recommended if initiated 15 years or later for completion of the HPV vaccine series.⁷
- **June 2019** – To further expand recommendations, catch-up vaccinations are recommended for all persons through age 26 years. For adults aged 27 through 45 years, ACIP did not recommend catch-up vaccination for all, although they did recognize that some persons

¹ Centers for Disease Control and Prevention (CDC). CDC – Human Papillomavirus Fact Sheet. <https://www.cdc.gov/std/hpv/stdfact-hpv.htm>. Accessed November 13, 2019.

² Centers for Disease Control and Prevention (CDC). CDC - How Many Cancers Are Linked with HPV Each Year? <https://www.cdc.gov/cancer/hpv/statistics/cases.htm>. Published 2018. Accessed August 8, 2019.

³ Viens LJ, Henley SJ, Watson M, et al. Human Papillomavirus-Associated Cancers - United States, 2008-2012. *MMWR Morb Mortal Wkly Rep.* 2016;65(26):661-666. Accessed August 8, 2019.

⁴ American Cancer Society. HPV Vaccines. <https://www.cancer.org/cancer/cancer-causes/infectious-agents/hpv/hpv-vaccines.html>. Accessed November 10, 2019.

⁵ Centers for Disease Control and Prevention (CDC). Quadrivalent Human Papillomavirus Vaccine Recommendations of the Advisory Committee on Immunization Practices (ACIP). *Morb Mortal Wkly Rep.* 2007;56. <https://www.cdc.gov/mmwr/pdf/rr/rr56e312.pdf>. Accessed August 8, 2019.

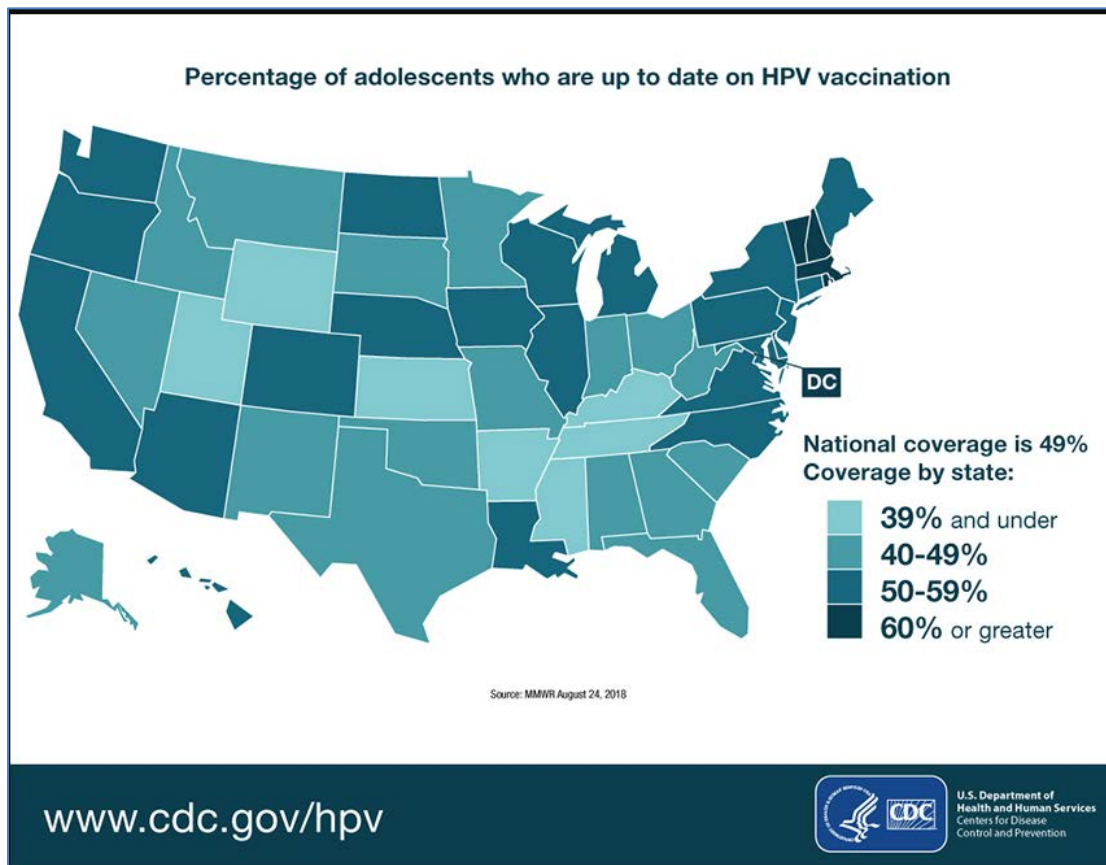
⁶ Centers for Disease Control and Prevention (CDC). FDA licensure of bivalent Human papillomavirus vaccine (HPV2, Cervarix) for use in females and updated HPV vaccination recommendations from the Advisory Committee on Immunization Practices (ACIP). 2010;59(20). <https://www.cdc.gov/mmwr/PDF/wk/mm5920.pdf>. Accessed August 8, 2019.

⁷ Meites E, Kempe A, Markowitz LE. Use of a 2-Dose Schedule for Human Papillomavirus Vaccination — Updated Recommendations of the Advisory Committee on Immunization Practices. *MMWR Morb Mortal Wkly Rep.* 2016;65(49):1405-1408. doi:10.15585/mmwr.mm6549a5.

who are inadequately vaccinated may benefit from vaccination due to at risk status for new HPV infection. For these persons, ACIP recommends shared clinical decision-making for HPV vaccination.⁸

According to the CDC's TeenVaxView, HPV vaccination rates are increasing as more children are up to date on HPV vaccination. Approximately 49% of adolescents ages 13-17 years were up to date on HPV vaccination series in the United States in 2017.⁹ (Figure 1) In Mississippi, the percent of adolescents up to date on HPV vaccine was only 28.8%.¹⁰

Figure 1: HPV Vaccination Coverage Rates⁹



⁸ Meites E, Szilagyi PG, Chesson HW, Unger ER, Romero JR, Markowitz LE. Human Papillomavirus Vaccination for Adults: Updated Recommendations of the Advisory Committee on Immunization Practices. MMWR Morb Mortal Wkly Rep 2019;68:698–702. DOI: <http://dx.doi.org/10.15585/mmwr.mm6832a3>

⁹ Centers for Disease Control and Prevention (CDC). Human Papillomavirus Coverage Data. <https://www.cdc.gov/hpv/hcp/vacc-coverage/index.html> Accessed November 8, 2019.

¹⁰ Centers for Disease Control and Prevention. TeenVaxView. 2017 Adolescent Human Papillomavirus (HPV) Vaccination Coverage Dashboard. <https://www.cdc.gov/vaccines/imz-managers/coverage/teenvaxview/data-reports/hpv/dashboard/2017.html> Accessed November 8, 2019.

Recent literature suggests that various factors such as age at initiation, gender, race, insurance coverage, provider specialty and geographic location are associated with HPV vaccination rates.^{11,12,13}

This report will assess HPV vaccine series completion rates in a sample of Mississippi Medicaid beneficiaries for the 2017 calendar year.

METHODS

A retrospective analysis was conducted using Mississippi Medicaid fee-for-service (FFS) and coordinated care organizations [CCOs: UnitedHealthcare (UHC) and Magnolia Health (Mag)] medical and pharmacy claims for the period of January 1, 2017 to December 31, 2017. Molina Healthcare was not included in the analysis due to the fact that the study period occurred prior to Molina's start date in Mississippi Medicaid. HPV related claims for beneficiaries aged 9 to 26 years during the study period were extracted for analysis. The first identified claim was recorded as the index event and the corresponding date as the index date. Beneficiaries who had a claim for an HPV vaccine in 2016 within a year of their index date in 2017 were excluded from the study to ensure that only true initiators in the study period were included. Beneficiaries were excluded if they did not have continuous enrollment during the study period or if they had been pregnant in the 12-month post-index period. This sample of beneficiaries was identified as "initiators". Beneficiaries were followed for 12 months in the post-index period to assess receipt of the remaining of the recommended doses of the vaccine.

¹¹ Franco, M., Mazzucca, S., Padek, M., & Brownson, R. C. (2019). Going beyond the individual: how state-level characteristics relate to HPV vaccine rates in the United States. *BMC Public Health*, 19(1). doi: 10.1186/s12889-019-6566-y

¹² Widdice LE, Bernstein DI, Leonard AC, Marsolo KA, Kahn JA. Adherence to the HPV Vaccine Dosing Intervals and Factors Associated With Completion of 3 Doses. *Pediatrics*. 2011;127(1):77-84. doi:10.1542/peds.2010-0812

¹³ Liu G, Kong L, Du P. HPV vaccine completion and dose adherence among commercially insured females aged 9 through 26 years in the US. *Papillomavirus Res*. 2016;2:1-8. doi:10.1016/j.pvr.2015.10.001

RESULTS

TABLE 1: HPV Vaccine-Eligible, Initiated and Completed Beneficiaries Aged 9-26 Years between January 1, 2017 – December 31, 2017 in Mississippi Medicaid												
Characteristic	FFS ^b				UHC ^b				Mag ^b			
	Vaccine-eligible (N = 28813)	Initiated (N = 1046)	Completed (N = 244)	Completion rate (23.3%) ^a	Vaccine-eligible (N = 84748)	Initiated (N = 5943)	Completed (N = 1759)	Completion rate (29.6%) ^a	Vaccine-eligible (N = 87344)	Initiated (N = 6667)	Completed (N = 1925)	Completion rate (28.9%) ^a
Age group^b												
9 to 10	3785	15	6	40.0%	18903	121	59	48.8%	19921	124	69	55.7%
11 to 12	3524	363	156	43.0%	16686	2552	1165	45.6%	17289	2881	1271	44.1%
13 to 14	3492	355	70	19.7%	15304	1996	455	22.8%	15643	2211	498	22.5%
15 to 18	6516	252	10	4.0%	26618	1249	74	5.9%	26589	1424	85	6.0%
19 to 26	11496	61	2	3.3%	7237	25	6	24.0%	7902	27	2	7.4%
Gender												
Female	16949	522	126	24.1%	44170	3026	907	30.0%	45988	3398	1020	30.2%
Male	11864	524	118	22.5%	40578	2917	852	29.2%	41356	3269	905	27.7%
Race												
Caucasian	10085	282	59	20.9%	27661	1553	482	31.0%	25019	1560	476	30.5%
African American	15512	672	156	23.2%	52855	4037	1146	28.4%	58339	4767	1323	27.8%
Hispanic	516	27	12	44.4%	2875	301	120	39.9%	2558	283	113	39.9%
Other	2700	65	17	26.2%	1357	52	11	21.2%	1428	57	13	22.8%
Note:												
^a Completion was defined as per ACIP guidelines, 2016. Completion rate was calculated as the proportion of completers among initiators within each category. Overall completion rate was 28.8% (3,928 of 13,656 beneficiaries).												
^b For beneficiaries who either initiated or completed, age and plan information was calculated as of their HPV vaccine initiation date. Since vaccine-eligible beneficiaries might not have an initiation date, age and plan information was calculated as of January 1, 2017. The 'Vaccine-eligible' numbers include benes who may have initiated and/or completed HPV vaccine series in the past.												

Table 1 displays HPV completion rates among Medicaid beneficiaries:

- Total of 13,656 beneficiaries initiated therapy during this time period;
- Overall completion rate was 28.8% (3,928 of 13,656 beneficiaries);
- Completion rates were higher among beneficiaries age 12 years and younger;
- Beneficiaries in both UHC and Mag had higher completion rates compared to beneficiaries in FFS;
- Hispanic beneficiaries had higher completion rates compared to other races across all plans.

* Detailed analysis of provider type data (not included in Table 1) indicated completion rates were highest among pediatricians.

CONCLUSIONS

Despite HPV vaccination completion rates rising across the nation, Mississippi continues to rank among the bottom of all states with a reported “up to date” rate of 28.8% in 2017. Effective strategies need to be implemented to improve HPV vaccination rates among Medicaid beneficiaries. A coordinated effort among providers and pharmacists targeting beneficiaries initiating the HPV vaccination series to increase completion rates is optimal. As the most easily accessible healthcare professionals, pharmacists can play a vital role in increasing HPV completion rates. All vaccines administered to individuals < 19 years are required to be submitted to the Mississippi Immunization Information eXchange (MIIX). Pharmacists can register to have access to the MIIX system and report vaccines administered in the pharmacy setting.

RECOMMENDATIONS

1. MS-DUR, along with DOM, will develop provider education emphasizing the importance of timely follow-up for beneficiaries initiating HPV vaccination series.
2. DUR should work with DOM to develop an initiative to encourage pharmacists to become more involved in both initiating and completing HPV vaccinations.
3. DOM will collaborate with the Mississippi State Department of Health in developing strategies to increase HPV vaccination completion rates in Mississippi.