

SUPPLEMENTARY MATERIALS

Table S1. Recommended 9vHPV vaccine schedules.

Description	9vHPV	
HPV strains	6, 11, 16, 18, 31, 33, 45, 52, 58	
Regimen	2 doses for individuals 9–14 years of age *	3 doses for individuals ≥15 years of age or immunocompromised *
Schedule		
Dose 1	0 months	0 months
Dose 2	6–12 months	1–2 months
Dose 3	NA	6 months

HPV, human papilloma virus; NA, not applicable.

* If a second dose is administered to an individual 9–14 years of age earlier than 5 months after the first dose, it is recommended to administer a third dose at least 5 months after the first dose and a minimum of 12 weeks after the second dose. The 3-dose schedule is also recommended for individuals 15–26 years of age (with the second dose 2 months after the first) and for individuals 9–26 years of age who are immunocompromised (with the second dose 1–2 months after the first).^{3, 58}

Table S2. International Statistical Classification of Diseases codes used to identify immunocompromised status.

ICD-9 codes	ICD-10 codes
042	B20–B24
135	B59
136.3	C00–C07, C11–C19, C22–C80, Z85
140–199	C7A, C7B, D3A
199.2	C80.2
200–208	C81–C83, C88–C96
235–239	D00–D49
260–262	D61.09, D61.810, D61.811, D61.818
277.3, 277.31, 277.39	D70, D70.0, D70.1, D70.2, D70.4, D70.8, D70.9
279.00, 279, 279.01, 279.02, 279.03, 279.04, 279.05, 279.06, 279.09, 279.10, 279.11, 279.12, 279.13, 279.19, 279.2, 279.3, 279.41, 279.49, 279.50, 279.51, 279.52, 279.53, 279.8, 279.9	D71
284.09, 284.11, 284.12, 284.19	D72.0, D72.81, D72.810, D72.818, D72.819, D72.89, D72.9
288.00, 288, 288.01, 288.02, 288.03, 288.09, 288.1, 288.2, 288.4, 288.50, 288.5, 288.51, 288.59, 288.8, 288.9	D73.81
289.53, 289.83, 289.89, 289.9	D75.81, D75.89, D75.9
340–341	D76.1, D76.2, D76.3
357	D80.0, D80.1, D80.2, D80.3, D80.4, D80.5, D80.6, D80.7, D80.8, D80.9
403.01, 403.11, 403.91	D81.0, D81.1, D81.2, D81.4, D81.6, D81.7, D81.89, D81.9
404.02, 404.03, 404.12, 404.13, 404.92, 404.93	D82.0, D82.1, D82.2, D82.3, D82.4, D82.8, D82.9
422	D83.0, D83.1, D83.2, D83.8, D83.9
446	D84.0, D84.1, D84.8, D84.9
495.9	D86
516	D89, D89.3, D89.810, D89.811, D89.812, D89.813, D89.82, D89.89, D89.9
555–558	E40–E43
579.3	E85, E85.0; M04, E85.1, E85.3, E85.8
585.5, 585.6	G35–G36
695.4	G37.1, G37.3, G37.8, G37.9
710–714	G61.0, G61.9
720	I12.0
725	I13.11, I13.2
795.7, 795.79	I40
996.80, 996.8, 996.81, 996.82, 996.83, 996.84, 996.85, 996.86, 996.87, 996.88, 996.89	J84.01, J84.02, J84.09
V08	K50–K52
V42, V42.0, V42.1, V42.6, V42.7, V42.81, V42.82, V42.83, V42.84, V42.89	K91.2
V45.11	L93.0, L93.2, M32
V56.0, V56.1, V56.2	L94, M35.8, M35.9 M01.X0, M02.10 M05–M14 M30

M31.5, M35.3
M35.9
M46
N18.5, N18.6
R76, R83.4–R87.4, R89.4
T78.40, J67.9
T86, T86.00, T86.01, T86.02, T86.03, T86.09,
T86.10, T86.11, T86.12, T86.13, T86.19, T86.20,
T86.21, T86.22, T86.23, T86.290, T86.298,
T86.30, T86.31, T86.32, T86.33, T86.39, T86.40,
T86.41, T86.42, T86.43, T86.49, T86.5, T86.810,
T86.811, T86.812, T86.818, T86.819, T86.830,
T86.831, T86.832, T86.838, T86.839, T86.850,
T86.851, T86.852, T86.858, T86.859, T86.890,
T86.891, T86.892, T86.898, T86.899, T86.90,
T86.91, T86.92, T86.93, T86.99
Z21
Z48.21, Z48.22, Z48.23, Z48.24, Z48.280,
Z48.290, Z48.298
Z49.01, Z49.02, Z49.31
Z94.0, Z94.1, Z94.2, Z94.3, Z94.4, Z94.81,
Z94.82, Z94.83, Z94.84, Z94.89, Z94, Z98.85
Z99.2

ICD, International Statistical Classification of Diseases.

Table S3. Proportion of proactive and routine vaccine initiators among all individuals potentially eligible to initiate an HPV vaccination series.

Initiator group	Privately insured database			Publicly insured database		
	Initiators (<i>N</i> = 100,117)	Eligible Recipients (<i>N</i> = 1,881,857)	Percentage initiating series	Initiators (<i>N</i> = 115,863)	Eligible Recipients (<i>N</i> = 1,933,636)	Percentage initiating series
Proactive	1,976	907,235	0.22	7,586	980,171	0.77
Routine	98,141	974,622	10.07	108,277	953,465	11.36

Proactive initiators were 9–10 years of age and routine initiators were 11–12 years of age at their index date.

Table S4. Demographic and clinical characteristics for sensitivity analysis study populations ^A.

	Privately insured database				Publicly insured database			
	Sensitivity analysis 1		Sensitivity analysis 2		Sensitivity analysis 1		Sensitivity analysis 2	
	(N = 94,012)		(N = 93,463)		(N = 105,584)		(N = 103,012)	
	Proactive	Routine	Proactive	Routine	Proactive	Routine	Proactive	Routine
	initiators	initiators	initiators	initiators	initiators	initiators	initiators	initiators
	(N = 867)	(N = 93,145)	(N = 318)	(N = 93,145)	(N = 4,418)	(N = 101,436)	(N = 1,576)	(N = 101,436)
Gender								
Female	459 (52.9)	47,801 (51.3)	185 (58.2)	47,801 (51.3)	2,062 (49.7)	51,061 (50.3)	780 (49.5)	51,061 (50.3)
Male	408 (47.1)	45,344 (48.7)	133 (41.8)	45,344 (48.7)	2,086 (50.3)	50,375 (49.7)	796 (50.5)	50,375 (49.7)
Race / ethnicity ^B								
Non-Hispanic White	-	-	-	-	1,348 (32.5)	43,424 (42.8)	518 (32.9)	43,424 (42.8)
Non-Hispanic Black	-	-	-	-	1,572 (37.9)	35,882 (35.4)	611 (38.8)	35,882 (35.4)
Hispanic	-	-	-	-	768 (18.5)	12,481 (12.3)	296 (18.8)	12,481 (12.3)
Other	-	-	-	-	460 (11.1)	9,649 (9.5)	151 (9.6)	9,649 (9.5)
Plan type								
PPO	416 (48.0)	44,819 (48.1)	146 (45.9)	44,819 (48.1)	-	-	-	-
CDHP or HDHP	216 (24.9)	26,468 (28.4)	83 (26.1)	26,468 (28.4)	-	-	-	-
HMO	148 (17.1)	13,083 (14.1)	61 (19.2)	13,083 (14.1)	3,088 (74.4)	67,075 (66.1)	1,128 (71.6)	67,075 (66.1)
Comprehensive	-	-	-	-	1,060 (25.6)	34,218 (33.7)	448 (28.4)	34,218 (33.7)
Other ^C	87 (10.0)	8,775 (9.4)	28 (8.8)	8,775 (9.4)	0 (-)	143 (0.1)	0 (-)	143 (0.1)

	Privately insured database				Publicly insured database			
	Sensitivity analysis 1		Sensitivity analysis 2		Sensitivity analysis 1		Sensitivity analysis 2	
	(N = 94,012)		(N = 93,463)		(N = 105,584)		(N = 103,012)	
	Proactive initiators (N = 867)	Routine initiators (N = 93,145)	Proactive initiators (N = 318)	Routine initiators (N = 93,145)	Proactive initiators (N = 4,418)	Routine initiators (N = 101,436)	Proactive initiators (N = 1,576)	Routine initiators (N = 101,436)
Urbanicity								
Rural	77 (8.9)	7,615 (8.2)	31 (9.8)	7,615 (8.2)	-	-	-	-
Urban	790 (91.1)	85,530 (91.8)	287 (90.3)	85,530 (91.8)	-	-	-	-
Geographic region								
Northeast	139 (16.0)	11,683 (12.5)	50 (15.7)	11,683 (12.5)	-	-	-	-
North Central	207 (23.9)	23,053 (24.8)	90 (28.3)	23,053 (24.8)	-	-	-	-
South	329 (38.0)	38,630 (41.5)	117 (36.8)	38,630 (41.5)	-	-	-	-
West	190 (21.9)	19,288 (20.7)	60 (18.9)	19,288 (20.7)	-	-	-	-
Unknown	2 (0.2)	491 (0.5)	1 (0.3)	491 (0.5)	-	-	-	-
Vaccine financing policy								
VFC only	326 (37.6)	32,440 (34.8)	120 (37.7)	32,440 (34.8)	-	-	-	-
VFC and underinsured	264 (30.4)	26,559 (28.5)	125 (39.3)	26,559 (28.5)	-	-	-	-
VFC and underinsured select	16 (1.9)	4,408 (4.7)	5 (1.6)	4,408 (4.7)	-	-	-	-
Universal	13 (1.5)	2,414 (2.6)	4 (1.3)	2,414 (2.6)	-	-	-	-
Universal select	35 (4.0)	6,135 (6.6)	10 (3.1)	6,135 (6.6)	-	-	-	-
Other	213 (24.6)	21,189 (22.8)	54 (17.0)	21,189 (22.8)	-	-	-	-

	Privately insured database				Publicly insured database			
	Sensitivity analysis 1		Sensitivity analysis 2		Sensitivity analysis 1		Sensitivity analysis 2	
	(N = 94,012)		(N = 93,463)		(N = 105,584)		(N = 103,012)	
	Proactive initiators (N = 867)	Routine initiators (N = 93,145)	Proactive initiators (N = 318)	Routine initiators (N = 93,145)	Proactive initiators (N = 4,418)	Routine initiators (N = 101,436)	Proactive initiators (N = 1,576)	Routine initiators (N = 101,436)
Provider type ^D								
Family medicine	120 (13.8)	9,241 (9.9)	46 (14.5)	9,241 (9.9)	51 (1.2)	4,397 (4.3)	17 (1.1)	4,397 (4.3)
Pediatrician	601 (69.3)	69,279 (74.4)	225 (70.8)	69,279 (74.4)	1,073 (25.9)	37,628 (37.1)	333 (21.1)	37,628 (37.1)
Physician (unspecified or rare specialty)	45 (5.2)	5,534 (5.9)	13 (4.1)	5,534 (5.9)	653 (15.7)	20,352 (20.1)	303 (19.2)	20,352 (20.1)
Internal medicine	10 (1.2)	1,610 (1.7)	1 (0.3)	1,610 (1.7)	16 (0.4)	457 (0.5)	6 (0.4)	457 (0.5)
Nurse practitioner	23 (2.7)	2,352 (2.5)	10 (3.1)	2,352 (2.5)	111 (2.7)	9,840 (9.7)	39 (2.5)	9,840 (9.7)
Other	68 (7.8)	5,129 (5.5)	23 (7.2)	5,129 (5.5)	2,244 (54.1)	28,762 (28.4)	878 (55.7)	28,762 (28.4)
Immunocompromised status								
Yes	5 (0.6)	311 (0.3)	2 (0.6)	311 (0.3)	16 (0.4)	308 (0.3)	5 (0.3)	308 (0.3)
No	862 (99.4)	92,834 (99.7)	316 (99.4)	92,834 (99.7)	4,132 (99.6)	101,128 (99.7)	1,571 (99.7)	101,128 (99.7)
Well check visits								
Yes	463 (53.4)	47,650 (51.2)	168 (52.8)	47,650 (51.2)	1,994 (48.1)	44,572 (43.9)	736 (46.7)	44,572 (43.9)
No	404 (46.6)	45,945 (48.8)	150 (47.2)	45,945 (48.8)	2,154 (51.9)	56,864 (56.1)	840 (53.3)	56,864 (56.1)
Prior vaccinations								
Yes	392 (45.2)	44,197 (47.5)	141 (44.3)	44,197 (47.5)	1,612 (38.9)	32,277 (31.8)	639 (40.6)	32,277 (31.8)
No	475 (54.8)	48,948 (52.6)	177 (55.7)	48,948 (52.6)	2,536 (61.1)	69,159 (68.2)	937 (59.5)	69,159 (68.2)
Index year								

	Privately insured database				Publicly insured database			
	Sensitivity analysis 1		Sensitivity analysis 2		Sensitivity analysis 1		Sensitivity analysis 2	
	(N = 94,012)		(N = 93,463)		(N = 105,584)		(N = 103,012)	
	Proactive initiators (N = 867)	Routine initiators (N = 93,145)	Proactive initiators (N = 318)	Routine initiators (N = 93,145)	Proactive initiators (N = 4,418)	Routine initiators (N = 101,436)	Proactive initiators (N = 1,576)	Routine initiators (N = 101,436)
2016	381 (43.9)	26,924 (28.9)	315 (99.1)	26,924 (28.9)	2,029 (48.9)	31,986 (31.5)	1576 (100)	31,986 (31.5)
2017	479 (55.3)	30,798 (33.1)	3 (0.9)	30,798 (33.1)	2,119 (51.1)	37,310 (36.8)	0 (-)	37,310 (36.8)
2018	7 (0.8)	34,801 (37.4)	0 (-)	34,801 (37.3)	0 (-)	32,140 (31.7)	0 (-)	32,140 (31.7)
2019	0 (-)	622 (0.7)	0 (-)	622 (0.7)	-	-	-	-

CDHP, consumer directed health plan; HDHP, high-deductible health plan; HMO, health maintenance organization; PPO, preferred provider organization; VFC, Vaccines for Children.

^A Values presented as *n* (%). Follow-up periods were defined as follows: base case, ≥13 months; sensitivity analysis 1, ≥25 months or until the year of 13th birthday, whichever occurred first; sensitivity analysis 2, ≥37 months or until the year of 13th birthday, whichever occurred first.

^B Individuals with no recorded data for race / ethnicity were included in the "Other" category.

^C Privately insured database: individuals with comprehensive, EPO, POS, POS with capitation, or any other health care plan were classified in "Others" category. Publicly insured database: individuals with PPO or any other health care plan were classified in the "Others" category.

^D The category Physician (unspecified or rare medical specialty) in both databases includes Physician, Surgery, Neonatal-Perinatal Medicine, Obstetrics & Gynecology, Medical doctor, where Physician includes Multi-Specialty Physician Group and Physician Assistant and Surgery includes Surgeon (NEC), Colon & Rectal Surgery, Neurological Surgery, Orthopedic Surgery, Abdominal Surgery, Cardiovascular Surgery, Dermatologic Surgery, General Vascular Surgery, Head and Neck Surgery, Pediatric Surgery, Transplant Surgery, Traumatic Surgery, Cardiothoracic Surgery and Thoracic Surgery. Individuals with pharmacist or missing data for provider type were included in the "Other" category.

Table S5. Percentage of vaccination series completers among proactive and routine initiators in 3 sensitivity analyses ^A

Initiator group	Privately insured database				Publicly insured database			
	Base case	Sensitivity	Sensitivity	Sensitivity	Base case	Sensitivity	Sensitivity	Sensitivity
	(N = 100,117)	analysis 1 (N = 94,012)	analysis 2 (N = 93,463)	analysis 3 (N = 100,117)	(N = 115, 863)	analysis 1 (N = 105,584)	analysis 2 (N = 103,312)	analysis 3 (N = 115, 863)
Proactive	76.2	84.2	87.7	76.3	70.4	78.0	82.0	70.6
Routine	48.1	47.3	47.3	66.2	40.0	39.2	39.2	52.4

^A Proactive initiators received their first HPV vaccination at 9–10 years of age, and routine initiators at 11–12 years of age. Follow-up periods were defined as follows: base case, ≥ 13 months (see main Results section); sensitivity analysis 1, ≥ 25 months or until the year of 13th birthday, whichever occurred first; sensitivity analysis 2, ≥ 37 months or until the year of 13th birthday, whichever occurred first; sensitivity analysis 3, ≥ 13 months plus 30-day grace period.

Table S6. Demographic and clinical characteristics associated with HPV vaccination series completion by 13 years of age in sensitivity analyses with extended follow-up periods ^A.

Characteristic	Value	Privately insured database		Publicly insured database	
		Sensitivity analysis 1	Sensitivity analysis 2	Sensitivity analysis 1	Sensitivity analysis 2
Age group (Referent: Routine initiators)	Proactive initiators	5.49 (4.56, 6.60)	6.57 (4.68, 9.23)	5.21 (4.83, 5.62)	6.17 (5.40, 7.04)
Sex (Referent: Male)	Female	1.13 (1.1, 1.16)	1.13 (1.1, 1.16)	1.07 (1.04, 1.10)	1.07 (1.04, 1.10)
Race / ethnicity (Referent: Non-Hispanic White)	Non-Hispanic Black	-	-	0.79 (0.77, 0.82)	0.79 (0.77, 0.82)
	Hispanic	-	-	1.09 (1.04, 1.13)	1.08 (1.03, 1.12)
	Other	-	-	1.04 (1.00, 1.09)	1.04 (1.00, 1.09)
Provider type (Referent: Pediatrician) ^B	Family medicine	1.10 (1.05, 1.15)	1.10 (1.05, 1.15)	0.95 (0.89, 1.01)	0.95 (0.89, 1.01)
	Physician (unspecified or rare specialty)	1.14 (1.07, 1.20)	1.14 (1.08, 1.21)	1.08 (1.04, 1.12)	1.08 (1.03, 1.12)
	Internal medicine	1.08 (0.97, 1.19)	1.08 (0.98, 1.19)	0.87 (0.72, 1.06)	0.89 (0.73, 1.08)
	Nurse practitioner	0.96 (0.88, 1.04)	0.96 (0.88, 1.04)	1.04 (0.99, 1.09)	1.04 (0.99, 1.09)
	Other	0.93 (0.88, 0.98)	0.93 (0.88, 0.99)	1.01 (0.98, 1.05)	1.02 (0.98, 1.05)
Region (Referent: South)	Northeast	1.03 (0.99, 1.08)	1.03 (0.99, 1.08)	-	-
	Northcentral	1.08 (1.04, 1.12)	1.08 (1.04, 1.12)	-	-
	West	1.13 (1.09, 1.18)	1.13 (1.09, 1.17)	-	-
	Unknown	0.59 (0.49, 0.71)	0.58 (0.48, 0.71)	-	-
Urbanicity (Referent: Urban)	Rural	1.08 (1.03, 1.13)	1.08 (1.03, 1.13)	-	-
Plan type (Referent: HMO)	PPO	0.82 (0.78, 0.85)	0.82 (0.78, 0.85)	-	-
	CDHP or HDHP	0.82 (0.79, 0.86)	0.82 (0.79, 0.86)	-	-
	Comprehensive	-	-	0.96 (0.93, 0.99)	0.96 (0.93, 0.99)
	Others	0.93 (0.88, 0.98)	0.93 (0.87, 0.98)	0.94 (0.67, 1.33)	0.95 (0.68, 1.33)
	VFC and underinsured	0.99 (0.96, 1.03)	0.99 (0.96, 1.03)	-	-

Characteristic	Value	Privately insured database		Publicly insured database	
		Sensitivity analysis 1	Sensitivity analysis 2	Sensitivity analysis 1	Sensitivity analysis 2
Vaccine financing policy (Referent: VFC only)	VFC and underinsured select	0.87 (0.81, 0.93)	0.87 (0.81, 0.93)	-	-
	Universal	0.79 (0.73, 0.87)	0.79 (0.72, 0.86)	-	-
	Universal select	0.73 (0.69, 0.78)	0.73 (0.69, 0.78)	-	-
	Other	1.09 (1.06, 1.14)	1.09 (1.06, 1.14)	-	-
Immunocompromised status (Referent: No)	Yes	0.09 (0.06, 0.14)	0.09 (0.06, 0.14)	0.11 (0.07, 0.16)	0.12 (0.08, 0.18)
Prior vaccinations (Referent: No)	Yes	1.38 (1.35, 1.42)	1.38 (1.35, 1.42)	1.45 (1.41, 1.50)	1.46 (1.42, 1.50)
Well check visits (Referent: No)	Yes	1.34 (1.30, 1.38)	1.34 (1.30, 1.38)	1.39 (1.35, 1.43)	1.39 (1.35, 1.43)
Index year (Referent: 2016)	2017	0.81 (0.79, 0.84)	0.81 (0.79, 0.84)	0.85 (0.83, 0.88)	0.86 (0.83, 0.88)
	2018	0.67 (0.65, 0.70)	0.68 (0.65, 0.70)	0.78 (0.75, 0.80)	0.78 (0.75, 0.81)
	2019	0.69 (0.58, 0.81)	0.69 (0.58, 0.81)	-	-

CDHP, consumer directed health plan; HDHP, high-deductible health plan; HMO, health maintenance organization; PPO, preferred provider organization; VFC, Vaccines for Children.

^A Analysis performed via logistic regression. Results presented as odds ratio (95% confidence interval). Follow-up periods were defined as follows: base case, ≥ 13 months; sensitivity analysis 1, ≥ 25 months or until the year of 13th birthday, whichever occurred first; sensitivity analysis 2, ≥ 37 months or until the year of 13th birthday, whichever occurred first.

^B The category Physician (unspecified or rare medical specialty) in both databases includes Physician, Surgery, Neonatal-Perinatal Medicine, Obstetrics & Gynecology, Medical doctor, where Physician includes Multi-Specialty Physician Group and Physician Assistant and Surgery includes Surgeon (NEC), Colon & Rectal Surgery, Neurological Surgery, Orthopedic Surgery, Abdominal Surgery, Cardiovascular Surgery, Dermatologic Surgery, General Vascular Surgery, Head and Neck Surgery, Pediatric Surgery, Transplant Surgery, Traumatic Surgery, Cardiothoracic Surgery and Thoracic Surgery. Individuals with pharmacist or missing data for provider type were included in the "Other" category.

Table S7. Demographic and clinical characteristics of the study population for a post-hoc sensitivity analysis allowing ≤ 4 years to complete an HPV vaccination series.

Characteristic	Privately insured database		Publicly insured database	
	(N = 17,157)		(N = 20,698)	
	Proactive initiators (N = 315)	Routine initiators (N = 16,842)	Proactive initiators (N = 1,563)	Routine initiators (N = 19,135)
Gender				
Female	182 (57.78)	8,705 (51.69)	772 (49.39)	9,728 (50.84)
Male	133 (42.22)	8,137 (48.31)	791 (50.61)	9,407 (49.16)
Race / ethnicity ^B				
White	-	-	512 (32.76)	8,370 (43.74)
Black	-	-	605 (38.71)	6,716 (35.10)
Hispanic	-	-	296 (18.94)	2,368 (12.38)
Other	-	-	150 (9.60)	1,681 (8.78)
Plan type				
PPO	146 (46.35)	8,282 (49.17)	-	-
CDHP or HDHP	80 (25.40)	4,581 (27.20)	-	-
HMO	61 (19.37)	2,630 (15.62)	1,121 (71.72)	12,183 (63.67)
Comprehensive	-	-	442 (28.28)	6,951 (36.33)
Other ^C	28 (8.89)	1,349 (8.01)	-	1 (0.01)
Urbanicity				
Rural	31 (9.84)	1,380 (8.19)	-	-
Urban	284 (90.16)	15,462 (91.81)	-	-
Geographic region				
Northeast	50 (15.87)	2,410 (14.31)	-	-

Characteristic	Privately insured database		Publicly insured database	
	(N = 17,157)		(N = 20,698)	
	Proactive initiators (N = 315)	Routine initiators (N = 16,842)	Proactive initiators (N = 1,563)	Routine initiators (N = 19,135)
North Central	89 (28.25)	4,312 (25.60)	-	-
South	116 (36.83)	7,017 (41.66)	-	-
West	59 (18.73)	3,078 (18.28)	-	-
Unknown	1 (0.32)	25 (0.15)	-	-
Vaccine financing policy				
VFC only	119 (37.78)	5,376 (31.92)	-	-
VFC and underinsured	123 (39.05)	6,803 (40.39)	-	-
VFC and underinsured select	5 (1.59)	819 (4.86)	-	-
Universal	4 (1.27)	307 (1.82)	-	-
Universal select	10 (3.17)	907 (5.39)	-	-
Other	54 (17.14)	2,630 (15.62)	-	-
Provider type ^D				
Family medicine	46 (14.6)	1,351 (8.0)	17 (1.1)	462 (2.4)
Pediatrician	222 (70.5)	13,344 (79.2)	327 (20.9)	4,795 (25.1)
Physician (unspecified or rare specialty)	13 (4.1)	783 (4.7)	298 (19.1)	6,161 (32.2)
Internal medicine	1 (0.3)	281 (1.7)	6 (0.4)	60 (0.3)
Nurse practitioner	10 (3.2)	353 (2.1)	38 (2.4)	1,878 (9.8)
Other	23 (7.3)	730 (4.3)	877 (56.1)	5,779 (30.2)

Characteristic	Privately insured database		Publicly insured database	
	(N = 17,157)		(N = 20,698)	
	Proactive initiators (N = 315)	Routine initiators (N = 16,842)	Proactive initiators (N = 1,563)	Routine initiators (N = 19,135)
Immunocompromised status				
Yes	2 (0.63)	52 (0.31)	5 (0.32)	48 (0.25)
No	313 (99.37)	16,790 (99.69)	1,558 (99.68)	19,087 (99.75)
Well check visits				
Yes	165 (52.38)	8,469 (50.29)	727 (46.51)	8,513 (44.49)
No	150 (47.62)	8,373 (49.71)	836 (53.49)	10,622 (55.51)
Prior vaccinations				
Yes	139 (44.13)	8,008 (47.55)	632 (40.44)	6,625 (34.62)
No	176 (55.87)	8,834 (52.45)	931 (59.56)	12,510 (65.38)
Index year				
2016	312 (99.05)	16,568 (98.37)	1,563 (100.00)	19,135 (100.00)
2017	3 (0.95)	274 (1.63)	-	-

CDHP, consumer directed health plan; HDHP, high-deductible health plan; HMO, health maintenance organization; PPO, preferred provider organization; VFC, Vaccines for Children

^A Values presented as N (%).

^B Individuals with no recorded data for race / ethnicity were included in the "Other" category.

^C Privately insured database: individuals with comprehensive, EPO, POS, POS with capitation, or any other health care plan were classified in "Others" category. Publicly insured database: individuals with PPO or any other health care plan were classified in the "Others" category.

^D The category Physician (unspecified or rare medical specialty) in both databases includes Physician, Surgery, Neonatal-Perinatal Medicine, Obstetrics & Gynecology, Medical doctor, where Physician includes Multi-Specialty Physician Group and Physician Assistant and Surgery includes Surgeon (NEC), Colon & Rectal Surgery, Neurological Surgery, Orthopedic Surgery, Abdominal Surgery, Cardiovascular Surgery, Dermatologic Surgery, General Vascular Surgery, Head and Neck Surgery, Pediatric Surgery, Transplant Surgery, Traumatic Surgery, Cardiothoracic Surgery and Thoracic Surgery. Individuals with pharmacist or missing data for provider type were included in the "Other" category.

Table S8. Percentage of proactive and routine vaccination series initiators who completed the series within 4 years ^A

Initiator group	Privately insured database	Publicly insured database
	(N = 17,157)	(N = 20,698)
Proactive	88.89	82.98
Routine	88.01	78.64

^A Proactive initiators received their first HPV vaccination at 9–10 years of age, and routine initiators at 11–12 years of age. Follow-up periods were defined as follows: proactive initiators, until year of 13th birthday; routine initiators, until year of 15th birthday.

Table S9. Demographic and clinical characteristics associated with HPV vaccination series completion within 4 years ^A

Characteristic	Value	Privately insured database	Publicly insured database
Age group (Referent: Routine initiators)	Proactive initiators	1.19 (0.82, 1.71)	1.47 (1.28, 1.69)
Sex (Referent: Male)	Female	1.07 (0.97, 1.17)	0.99 (0.93, 1.06)
Race / ethnicity (Referent: White)	Black	-	0.88 (0.82, 0.95)
	Hispanic	-	1.27 (1.12, 1.43)
	Other	-	0.99 (0.87, 1.12)
Provider type (Referent: Pediatrician) ^B	Family medicine	0.57 (0.49, 0.67)	0.49 (0.40, 0.61)
	Physician (unspecified or rare specialty)	0.79 (0.63, 0.99)	0.86 (0.75, 0.98)
	Internal medicine	1.08 (0.73, 1.61)	0.67 (0.38, 1.19)
	Nurse practitioner	0.47 (0.36, 0.61)	1.04 (0.89, 1.21)
	Other	0.49 (0.40, 0.59)	0.55 (0.49, 0.63)
Region (Referent: South)	Northeast	1.06 (0.91, 1.24)	-
	Northcentral	1.67 (1.45, 1.93)	-
	West	1.11 (0.97, 1.28)	-

Characteristic	Value	Privately insured database	Publicly insured database
	Unknown	0.51 (0.20, 1.28)	-
Urbanicity (Referent: Urban)	Rural	0.59 (0.51, 0.69)	-
Plan type (Referent: HMO)	PPO	0.8 (0.69, 0.93)	-
	CDHP or HDHP	0.91 (0.77, 1.07)	-
	Comprehensive	-	0.99 (0.88, 1.12)
	Others	0.63 (0.51, 0.77)	- ^c
Vaccine financing policy (Referent: VFC only)	VFC and underinsured	1.02 (0.90, 1.16)	-
	VFC and underinsured select	0.97 (0.74, 1.28)	-
	Universal	0.83 (0.58, 1.20)	-
	Universal select	0.7 (0.58, 0.86)	-
	Other	0.96 (0.83, 1.11)	-
Immunocompromised status (Referent: No)	Yes	0.07 (0.04, 0.12)	0.11 (0.06, 0.21)
Prior vaccinations (Referent: No)	Yes	1.73 (1.55, 1.92)	1.29 (1.19, 1.39)
Well check visits (Referent: No)	Yes	1.75 (1.57, 1.94)	1.35 (1.25, 1.45)
Index year (Referent: 2016)	2017	0.99 (0.69, 1.44)	-

CDHP, consumer directed health plan; HDHP, high-deductible health plan; HMO, health maintenance organization; PPO, preferred provider organization; VFC, Vaccines for Children.

A Analysis performed via logistic regression. Results presented as odds ratio (95% confidence interval). Follow-up periods were defined as follows: proactive initiators, until year of 13th birthday; routine initiators, until year of 15th birthday.

B The category Physician (unspecified or rare medical specialty) in both databases includes Physician, Surgery, Neonatal-Perinatal Medicine, Obstetrics & Gynecology, Medical doctor, where Physician includes Multi-Specialty Physician Group and Physician Assistant and Surgery includes Surgeon (NEC), Colon & Rectal Surgery, Neurological Surgery, Orthopedic Surgery, Abdominal Surgery, Cardiovascular Surgery, Dermatologic Surgery, General Vascular Surgery, Head and Neck Surgery, Pediatric Surgery, Transplant Surgery, Traumatic Surgery, Cardiothoracic Surgery and Thoracic Surgery. Individuals with pharmacist or missing data for provider type were included in the "Other" category.

C Estimates were not stable and are therefore not reported.