

Supplementary Online Content

Gillison ML, Broutian T, Pickard RKL, et al. Prevalence of oral HPV infection in the United States, 2009-2010. *JAMA*. 2012. doi:10.1001/jama.2012.101.

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This supplementary material has been provided by the authors to give readers additional information about their work.

eTable 1: Comparison of characteristics of Oral HPV protocol participants vs. non-participants and MEC ACASI participants vs. non-participants

Characteristic		HPV Test Participant	HPV Test Non-Participant		ACASI Participant	ACASI Non-Participant	
	<i>Total (%)</i>	<i>n (%)</i>	<i>n (%)</i> ^b	<i>p-value</i> ^a	<i>n (%)</i> ^b	<i>n (%)</i>	<i>p-value</i> ^a
Total	5987	5501 (91.7)	486 (8.3) ^b		4964 (90.9)	537 (9.1)	
Age, Mean (SE)	40.0 (0.30)	39.8 (0.34)	42.0 (0.85)	0.042	39.9	39.2	0.555
Age, years				0.008			0.071
14-17	685 (8.1)	656 (8.4)	29 (5.3)		618 (8.7)	38 (5.7)	
18-24	833 (12.6)	792 (13.0)	41 (7.8)		719 (13.1)	73 (12.1)	
25-29	490 (9.9)	463 (10.2)	27 (6.6)		405 (9.7)	58 (15.1)	
30-34	497 (8.7)	436 (8.4)	61 (12.1)		387 (8.3)	49 (9.0)	
35-39	514 (9.4)	461 (9.2)	53 (12.0)		400 (8.9)	61 (11.5)	
40-44	551 (10.2)	495 (10.0)	56 (13.2)		444 (9.9)	51 (10.3)	
45-49	536 (9.8)	482 (9.8)	54 (10.0)		438 (9.8)	44 (9.3)	
50-54	516 (9.9)	474 (9.7)	42 (11.2)		436 (10.0)	38 (7.2)	
55-59	418 (8.7)	381 (8.8)	37 (7.4)		344 (8.8)	37 (8.3)	
60-64	545 (7.1)	498 (7.0)	47 (7.5)		453 (7.1)	45 (5.9)	
65-69	402 (5.7)	363 (5.6)	39 (6.9)		320 (5.6)	43 (5.6)	
Gender				0.004			0.006
Male	2954 (49.5)	2748 (50.0)	206 (43.8)		2531 (50.8)	217 (41.8)	
Female	3033 (50.5)	2753 (50.0)	280 (56.2)		2433 (49.2)	320 (58.2)	
Race/Ethnicity				0.209			0.200
Mexican American	1270 (9.7)	1189 (9.9)	81 (7.2)		1062 (9.7)	127 (11.7)	
Other Hispanic	663 (5.4)	624 (5.5)	39 (3.6)		566 (5.5)	58 (5.8)	
White, Non-Hispanic	2535 (65.4)	2282 (64.9)	253 (70.6)		2106 (66.2)	176 (51.6)	
Black, Non-Hispanic	1167 (12.1)	1081 (12.2)	86 (11.1)		969 (12.0)	112 (14.4)	
Other race	352 (7.4)	325 (7.4)	27 (7.6)		261 (6.5)	64 (16.6)	
Level of education				0.358			0.099
Less than high-school	2146 (24.7)	1987 (24.9)	159 (22.5)		1762 (24.3)	225 (30.3)	
High-school or equivalent	1248 (21.1)	1126 (20.7)	122 (25.6)		1032 (21.0)	94 (18.0)	
Some college or greater	2581 (54.0)	2379 (54.3)	202 (51.6)		2162 (54.5)	217 (51.7)	
Missing	12 (0.2)	9 (0.2)	3 (0.3)		8 (0.2)	1 (0.05)	

eTable 1 continued

Characteristic		HPV Test Participant	HPV Test Non-Participant		ACASI Participant	ACASI Non-Participant	
	Total (%)	n (%)	n (%)	p-value ^a	n (% ^b)	n (%)	p-value ^a
Income-to-poverty ratio				0.062			<0.001
<1.0	1389 (15.0)	1263 (15.0)	126 (16.0)		1113 (14.6)	150 (19.0)	
≥1.0 to <2.0	1445 (17.6)	1349 (17.7)	96 (16.5)		1202 (17.2)	147 (22.2)	
≥2.0 to <3.0	720 (13.4)	652 (12.9)	68 (18.9)		597 (13.0)	55 (11.9)	
≥3.0	1852 (46.0)	1719 (46.6)	133 (39.8)		1616 (48.3)	103 (29.6)	
Missing	581 (7.9)	518 (7.9)	63 (8.8)		436 (6.9)	82 (17.4)	
Marital Status				<0.001			0.721
Never married	2018 (29.3)	1892 (29.9)	126 (22.9)		1711 (29.6)	181 (32.3)	
Married/living with partner	3021 (56.9)	2771 (56.7)	250 (58.3)		2501 (56.9)	270 (54.7)	
Widowed/divorced/separated	944 (13.8)	834 (13.3)	110 (18.8)		748 (13.3)	86 (13.0)	
Missing	4 (0.1)	4 (0.1)	0 (--)		4 (0.1)	0 (--)	

^a P-values for age as a continuous variable were calculated using logistic regression. P-values for categorical variables were calculated using the adjusted Wald F test. Subjects with missing data were excluded from the p-value computations.

^b Includes 2 participants who provided oral rinse specimens, but samples were not evaluable for HPV testing (beta-globin negative).

eTable 2: Comparison of demographic and behavioral characteristics by gender

Characteristic	Male		Female		p-value
	Number of subjects	% (95% CI)	Number of subjects	% (95% CI)	
Marital Status					0.002
Never married	902	30.9 (28.5-33.4)	809	28.3 (26.1-30.7)	
Married/living with partner	1318	57.9 (55.9-59.9)	1183	55.9 (52.9-58.9)	
Widowed/divorced/separated	309	11.2 (9.9-12.6)	439	15.6 (13.6-17.8)	
Cigarette Use^a					0.014
Never/former	1877	77.4 (75.4-79.2)	1923	79.6 (77.3-81.7)	
Current, < 10 cigarettes/day	398	12.2 (10.3-14.4)	328	12.7 (11.6-13.9)	
Current, 10-20 cigarettes/day	196	8.0 (6.2-10.2)	147	6.3 (4.7-8.3)	
Current, > 20 cigarettes/day	54	2.4 (1.7-3.3)	30	1.2 (0.8-1.8)	
Ever had sex (vaginal, anal, oral)^b					0.166
No	318	9.9 (8.1-12.1)	274	8.7 (7.7-9.8)	
Yes	2202	89.9 (87.6-91.8)	2144	91.0 (89.8-92.0)	
Ever performed oral sex^b					0.406
No	719	21.3 (18.7-24.0)	754	22.0 (19.9-24.3)	
Yes	1796	78.3 (75.6-80.8)	1656	77.4 (75.1-79.5)	
Ever had vaginal sex^b					0.106
No	380	11.8 (10.2-13.7)	311	10.0 (8.9-11.2)	
Yes	2141	88.0 (86.0-89.7)	2108	89.7 (88.5-90.8)	
Number of lifetime oral sex partners^c	2122		2036		0.007
Mean (95% CI)		8.6 (5.6-11.6)		4.0 (2.6-5.5)	
Number of recent oral sex partners^c	2124		2038		0.006
Mean (95% CI)		1.2 (1.0-1.4)		0.8 (0.8-0.9)	
Age at oral sex debut, years^c	1533		1437		0.005
Mean (95% CI)		19.3 (19.0-19.7)		19.9 (19.5-20.3)	

eTable 2 continued

Characteristic	Male		Female		p-value
	Number of subjects	% (95% CI)	Number of subjects	% (95% CI)	
Time since new oral partner^c	1535		1438		0.001
Mean (95% CI)		91.3 (82.3-100.3)		105.6 (97.4-113.8)	
Number of lifetime any sex partners^b	2123		2023		<0.001
Mean (95% CI)		15.9 (12.9-18.9)		6.9 (6.5-7.4)	
Number of recent any sex partners^c	2131		2034		0.002
Mean (95% CI)		1.4 (1.2-1.6)		1.1 (1.0-1.1)	
Number of lifetime vaginal sex partners^c	2121		2028		<0.001
Mean (95% CI)		14.0 (10.9-17.1)		6.5 (6.0-6.9)	
Number of recent vaginal sex partners^c	2127		2033		<0.001
Mean (95% CI)		2.2 (1.9-2.6)		1.5 (1.3-1.7)	

Note: percentages denote column percentages. Values do not add up to 100% because of missing data.

^a Ever use of cigarettes was defined for individuals age 14-19 as ever having tried cigarettes and for age 20-69 as lifetime use of ≥ 100 cigarettes. A current smoker was defined as someone who had smoked a cigarette in the prior 30 days. A former smoker was defined as an ever user who had not smoked a cigarette in the prior 30 days.

^b Analyses were restricted to individuals aged 14-69 years who responded to the ACASI questionnaire (N=4964).

^c Analyses were restricted to individuals aged 14-59 years who responded to the ACASI questionnaire (N=4191).

eTable 3: Prevalence of HPV infection by demographic and behavioral characteristics stratified by gender

Characteristic	Number with HPV infection	Males		Number with HPV infection	Females	
		HPV Prevalence, % (95% CI)	Unadjusted Prevalence Ratio (95% CI)		HPV Prevalence, % (95% CI)	Unadjusted Prevalence Ratio (95% CI)
Age, years^a						
14-17	7	1.3 (0.5-3.5)	1.00	9	2.3 (1.2-4.4)	1.00
18-24	29	6.5 (4.2-10.0)	5.11 (1.52-17.15)	16	4.5 (1.9-10.2)	2.01 (0.64-6.28)
25-29	19	9.5 (5.4-16.2)	7.47 (2.23-24.99)	13	4.8 (2.3-9.6)	2.12 (0.81-5.56)
30-34	28	11.6 (6.9-18.9)	9.13 (2.98-27.95)	11	3.0 (1.7-5.5)	1.35 (0.49-3.71)
35-39	23	8.1 (4.9-13.3)	6.38 (2.01-20.21)	8	2.6 (1.1-6.0)	1.14 (0.45-2.92)
40-44	21	10.6 (7.0-15.6)	8.27 (2.69-25.41)	9	2.5 (1.0-6.0)	1.11 (0.38-3.29)
45-49	27	11.0 (5.4-21.0)	8.61 (2.63-28.26)	10	3.7 (1.6-8.5)	1.65 (0.45-6.09)
50-54	35	12.0 (7.0-19.7)	9.38 (3.15-27.90)	15	4.7 (2.4-9.2)	2.10 (0.90-4.94)
55-59	40	18.3 (11.0-29.0)	14.37 (4.72-43.71)	7	3.7 (1.4-9.2)	1.62 (0.53-4.94)
60-64	43	18.2 (13.3-24.5)	14.31 (4.38-46.71)	12	5.9 (2.9-11.6)	2.62 (1.18-5.83)
65-69	23	7.6 (4.2-13.4)	5.96 (1.67-21.30)	3	0.4 (0.1-1.5)	0.16 (0.03-0.85)
<i>p-value (p-trend)^b</i>		<i>0.052 (0.008)</i>			<i>0.082 (0.984)</i>	
Race/Ethnicity^a						
Mexican American	48	7.5 (5.5-10.0)	0.78 (0.51-1.18)	28	4.6 (3.2-6.6)	1.38 (0.68-2.78)
Other Hispanic	34	10.6 (7.3-15.1)	1.10 (0.67-1.80)	14	5.0 (3.1-7.9)	1.49 (0.66-3.38)
White, Non-Hispanic	111	9.6 (6.9-13.2)	1.00	43	3.3 (1.9-5.7)	1.00
Black, Non-Hispanic	94	17.2 (12.6-23.0)	1.79 (1.15-2.78)	23	4.5 (2.5-7.8)	1.34 (0.59-3.05)
Other race	8	6.6 (2.6-15.5)	0.68 (0.24-1.90)	5	2.5 (1.0-6.1)	0.75 (0.26-2.23)
<i>p-value</i>		<i>0.031</i>			<i>0.198</i>	
Education^a						
Less than high-school	88	7.2 (5.5-9.3)	1.00	51	5.3 (3.5-8.0)	1.00
High-school or equivalent	82	13.2 (10.1-17.2)	1.84 (1.25-2.71)	24	3.9 (2.2-6.9)	0.73 (0.35-1.54)
Some college or greater	125	10.3 (7.6-13.9)	1.44 (0.93-2.21)	38	2.8 (1.5-5.0)	0.52 (0.25-1.09)
Missing	0	0 (-)	-	0	0 (-)	-
<i>p-value</i>		<i>0.048</i>			<i>0.198</i>	
Income-to-poverty ratio^a						
<1.0	69	10.0 (8.2-12.1)	1.00	49	7.9 (5.4-11.6)	1.00
≥1.0 to <2.0	76	10.8 (8.9-13.0)	1.07 (0.82-1.41)	31	4.7 (2.8-7.9)	0.60 (0.33-1.07)
≥2.0 to <3.0	32	10.1 (7.3-13.8)	1.01 (0.68-1.49)	13	3.3 (1.5-7.1)	0.42 (0.18-0.99)
≥3.0	89	10.0 (7.3-13.7)	1.00 (0.67-1.51)	13	1.7 (0.7-4.5)	0.22 (0.09-0.55)
Missing	29	9.6 (6.5-13.9)	-	7	3.1 (1.4-7.0)	-
<i>p-value (p-trend)</i>		<i>0.947 (0.888)</i>			<i>0.012 (0.001)</i>	
Marital Status^a						
Never married	67	7.4 (5.7-9.6)	1.00	50	5.0 (3.4-7.3)	1.00
Married/living with partner	163	10.4 (7.5-14.2)	1.40 (0.87-2.26)	40	2.9 (2.1-4.0)	0.58 (0.39-0.85)
Widowed/divorced/separated	65	16.4 (12.7-20.9)	2.21 (1.45-3.36)	23	3.9 (2.1-7.0)	0.78 (0.48-1.29)
Missing	0	0 (-)	-	0	0 (-)	-
<i>p-value</i>		<i>0.013</i>			<i>0.084</i>	

eTable 3 continued

Characteristic	Number with HPV infection	Males		Number with HPV infection	Females	
		HPV Prevalence, % (95% CI)	Unadjusted Prevalence Ratio (95% CI)		HPV Prevalence, % (95% CI)	Unadjusted Prevalence Ratio (95% CI)
Cigarette Use^a						
Never/former	168	8.4 (6.4-11.0)	1.00	69	2.6 (1.7-4.0)	1.00
Current, <10 cigarettes/day	73	15.1 (11.0-20.4)	1.80 (1.26-2.58)	21	4.1 (2.5-6.8)	1.58 (0.85-2.96)
Current, 11-20 cigarettes/day	40	16.3 (10.1-25.3)	1.95 (1.13-3.35)	15	12.6 (7.8-19.7)	4.84 (2.90-8.09)
Current, >20 cigarettes/day	12	21.2 (13.1-32.3)	2.52 (1.55-4.09)	5	19.7 (4.6-55.3)	7.57 (1.95-29.47)
Missing	2	2.2 (0.4-10.6)	-	3	4.3 (0.9-18.5)	-
<i>p-value (p-trend)</i>		<i><0.001 (<0.001)</i>			<i>0.003 (0.017)</i>	
Alcohol use in the past 12 months, average number of drinks per week^c						
0	71	11.6 (8.2-16.2)	1.00	38	4.5 (2.8-7.0)	1.00
< 1	37	9.0 (5.6-14.2)	0.78 (0.41-1.49)	18	2.8 (1.5-5.2)	0.62 (0.34-1.12)
1-7	76	10.1 (7.3-13.8)	0.87 (0.59-1.27)	13	1.9 (1.2-2.9)	0.42 (0.24-0.76)
8-14	45	14.5 (10.1-20.4)	1.25 (0.79-1.99)	6	6.3 (2.5-14.8)	1.41 (0.54-3.69)
> 14	29	14.1 (8.0-23.6)	1.22 (0.83-1.78)	4	4.4 (1.7-10.7)	0.99 (0.32-3.02)
Missing	23	11.6 (6.4-20.0)	-	18	5.4 (2.8-10.1)	-
<i>p-value (p-trend)</i>		<i>0.388 (0.085)</i>			<i>0.129 (0.447)</i>	
Marijuana use^d						
Never	69	5.9 (4.3-8.0)	1.00	34	2.5 (1.7-3.7)	1.00
Former	93	12.1 (8.6-16.7)	2.06 (1.21-3.49)	31	3.3 (2.2-4.9)	1.31 (0.79-2.17)
Current	46	13.9 (10.1-18.9)	2.37 (1.38-4.09)	11	8.1 (3.7-16.9)	3.26 (1.53-6.91)
Missing	2	22.0 (4.5-62.8)	-	0	0 (-)	-
<i>p-value (p-trend)</i>		<i>0.025 (0.006)</i>			<i>0.133 (0.042)</i>	
Ever had sex (vaginal, anal, or oral)^e						
No	4	0.7 (0.2-2.5)	1.00	4	1.1 (0.3-3.3)	1.00
Yes	265	11.3 (9.1-13.9)	16.42 (4.20-64.12)	85	3.6 (2.5-5.1)	3.37 (0.96-11.77)
Missing	3	18.5 (3.5-58.5)	-	0	0 (-)	-
<i>p-value</i>		<i><0.001</i>			<i>0.017</i>	
Ever performed oral sex^e						
No	37	4.8 (2.6-8.5)	1.00	22	2.3 (1.5-3.6)	1.00
Yes	233	11.7 (9.3-14.7)	2.46 (1.22-4.95)	67	3.7 (2.5-5.3)	1.60 (0.94-2.73)
Missing	2	9.1 (2.0-33.2)	-	0	0 (-)	-
<i>p-value</i>		<i>0.006</i>			<i>0.083</i>	
Ever had anal sex^e						
No	134	7.5 (6.1-9.2)	1.00	60	3.2 (2.0-5.1)	1.00
Yes	137	14.7 (10.9-19.4)	1.96 (1.39-2.75)	29	3.7 (2.4-5.6)	1.15 (0.61-2.13)
Missing	1	4.6 (0.4-36.9)	-	0	0 (-)	-
<i>p-value</i>		<i>0.006</i>			<i>0.646</i>	
Sexual orientation^e						
Never had sex	2	0.7 (0.2-2.5)	0.06 (0.02-0.24)	4	1.1 (0.3-3.3)	0.31 (0.09-1.08)
Homosexual/bisexual	20	10.2 (5.4-18.3)	0.90 (0.51-1.58)	9	5.2 (1.9-13.4)	1.00
Heterosexual	245	11.3 (9.1-13.9)	1.00	76	3.4 (2.3-5.0)	1.52 (0.54-4.31)
Missing	3	18.5 (3.5-58.5)	-	0	0 (-)	-
<i>p-value</i>		<i>0.001</i>			<i>0.060</i>	

eTable 3 continued

Characteristic	Number with HPV infection	Males		Number with HPV infection	Females	
		HPV Prevalence, % (95% CI)	Unadjusted Prevalence Ratio (95% CI)		HPV Prevalence, % (95% CI)	Unadjusted Prevalence Ratio (95% CI)
Number of lifetime oral sex partners^d						
0	22	4.6 (2.5-8.6)	1.00	16	2.4 (1.4-4.0)	1.00
1	18	3.6 (2.0-6.4)	0.78 (0.35-1.72)	13	3.0 (1.4-6.3)	1.27 (0.49-3.28)
2-5	71	9.3 (6.9-12.6)	2.01 (0.99-4.07)	31	3.2 (1.8-5.6)	1.35 (0.58-3.18)
6-10	31	13.3 (8.4-20.4)	2.86 (1.17-6.98)	9	4.6 (2.2-9.6)	1.96 (0.90-4.28)
11-20	29	18.6 (12.0-27.7)	4.01 (1.76-9.12)	2	6.0 (0.6-39.0)	2.57 (0.28-23.50)
≥21	37	26.0 (14.6-42.0)	5.60 (2.30-13.66)	4	8.0 (1.8-29.6)	3.39 (0.79-14.61)
Missing	2	5.1 (1.1-20.9)	-	1	5.3 (0.7-31.0)	-
<i>p-value (p-trend)</i>		<0.001 (0.001)			0.540 (0.071)	
Number of oral sex partners in the past 12 months^d						
0	49	5.8 (4.3-7.6)	1.00	27	2.2 (1.4-3.3)	1.00
1	108	11.7 (9.4-14.6)	2.04 (1.41-2.95)	36	3.3 (2.4-4.7)	1.53 (0.95-2.45)
≥2	51	14.5 (9.4-21.8)	2.52 (1.40-4.56)	13	8.4 (3.8-17.4)	3.85 (1.72-8.64)
Missing	2	7.2 (1.5-27.9)	-	0	0 (-)	-
<i>p-value</i>		0.009			0.079	
Age first performed oral sex^d						
Never performed oral sex	22	4.6 (2.5-8.6)	0.38 (0.17-0.85)	16	2.4 (1.4-4.0)	0.48 (0.22-1.05)
≤18	116	12.4 (9.1-16.7)	1.00	35	4.9 (2.9-8.2)	1.00
>18	70	9.7 (7.5-12.5)	0.79 (0.54-1.14)	25	2.4 (1.6-3.5)	0.49 (0.26-0.90)
Missing	2	6.3 (1.3-25.0)	-	0	0 (-)	-
<i>p-value</i>		0.030			0.213	
Time since new oral sex partner^d						
Never performed oral sex	22	4.6 (2.5-8.6)	0.38 (0.17-0.86)	16	2.4 (1.4-4.0)	0.35 (0.18-0.70)
≤12 months	87	12.2 (9.0-16.3)	1.00	37	6.7 (4.5-9.8)	1.00
12-24 months	21	17.2 (11.2-25.5)	1.41 (0.87-2.29)	2	3.7 (0.8-15.9)	0.55 (0.11-2.70)
>24 months	78	9.7 (7.1-13.3)	0.80 (0.56-1.14)	21	1.9 (0.9-3.8)	0.28 (0.14-0.56)
Missing	2	7.7 (1.6-30.1)	-	0	0 (-)	-
<i>p-value</i>		0.056			0.026	
Barrier use during oral sex in the past 12 months^d						
No oral sex past 12 months	49	5.8 (4.3-7.6)	0.46 (0.30-0.69)	27	2.2 (1.4-3.3)	0.57 (0.32-1.00)
Never/rarely	137	12.6 (9.9-15.8)	1.00	41	3.9 (2.3-6.3)	1.00
Usually/always	18	10.3 (5.4-18.9)	0.82 (0.47-1.44)	8	7.7 (4.1-14.0)	2.00 (0.80-5.00)
Missing	6	9.5 (3.9-21.2)	-	0	0 (-)	-
<i>p-value</i>		0.014			0.015	

eTable 3 continued

Characteristic	Number with HPV infection	Males		Number with HPV infection	Females	
		HPV Prevalence, % (95% CI)	Unadjusted Prevalence Ratio (95% CI)		HPV Prevalence, % (95% CI)	Unadjusted Prevalence Ratio (95% CI)
Number of lifetime sex partners (any sex)^e						
0	5	1.0 (0.3-2.9)	1.00	5	1.4 (0.5-3.7)	1.00
1	8	3.2 (1.3-7.6)	3.34 (0.66-17.00)	9	1.2 (0.6-2.3)	0.89 (0.29-2.73)
2-5	37	4.6 (3.1-6.7)	4.79 (1.47-15.56)	40	3.7 (2.0-6.6)	2.67 (0.83-8.59)
6-10	63	13.6 (9.9-18.5)	14.32 (4.32-47.41)	15	3.3 (1.9-5.7)	2.40 (0.77-7.46)
11-20	52	12.4 (8.6-17.7)	13.06 (4.04-42.22)	8	3.1 (1.4-6.5)	2.23 (0.59-8.42)
≥21	101	23.0 (18.6-28.1)	24.19 (7.22-81.11)	11	11.8 (5.5-23.5)	8.61 (2.29-32.36)
Missing	6	9.7 (3.6-23.2)	-	1	2.2 (0.4-12.7)	-
<i>p-value (p-trend)</i>		<i>0.001 (<0.001)</i>			<i>0.075 (0.010)</i>	
Number of sex partners (any sex) in the past 12 months^d						
0	30	5.2 (3.2-8.3)	1.00	13	1.7 (1.0-2.8)	1.00
1	123	10.6 (8.4-13.3)	2.06 (1.19-3.56)	45	3.1 (2.2-4.4)	1.88 (1.07-3.31)
≥2	55	12.3 (8.9-16.6)	2.38 (1.23-4.61)	18	7.3 (3.9-13.2)	4.41 (1.83-10.63)
Missing	2	16.8 (3.4-53.7)	-	0	0 (-)	-
<i>p-value (p-trend)</i>		<i>0.025 (0.012)</i>			<i>0.043 (0.019)</i>	
Number of lifetime vaginal sex partners^d						
0	8	1.5 (0.8-3.1)	1.00	5	1.3 (0.5-3.5)	1.00
1	12	3.6 (1.6-8.1)	2.36 (0.67-8.36)	8	1.4 (0.7-2.7)	1.09 (0.43-2.77)
2-5	32	5.2 (3.9-6.9)	3.41 (1.58-7.37)	33	3.8 (2.2-6.3)	2.94 (0.93-9.32)
6-10	43	13.1 (9.3-18.0)	8.51 (3.59-20.20)	13	3.4 (1.8-6.4)	2.66 (0.81-8.68)
11-20	37	12.0 (7.9-17.8)	7.81 (3.47-17.57)	8	3.4 (1.7-7.0)	2.69 (0.75-9.63)
≥21	76	23.5 (18.5-29.3)	15.30 (7.25-32.29)	8	11.4 (4.2-27.1)	8.88 (2.05-38.52)
Missing	2	6.9 (1.4-27.9)	-	1	3.5 (0.5-22.1)	-
<i>p-value (p-trend)</i>		<i>0.001 (<0.001)</i>			<i>0.108 (0.021)</i>	
Number of vaginal sex partners in the past 12 months^d						
0	26	5.1 (3.2-8.0)	1.00	14	1.7 (1.0-2.9)	1.00
1	119	10.8 (8.4-13.8)	2.115 (1.20-3.71)	42	3.1 (2.2-4.6)	1.85 (1.05-3.24)
≥2	63	11.6 (8.7-15.4)	2.27 (1.29-3.99)	20	6.3 (3.6-10.8)	3.70 (1.60-8.53)
Missing	2	15.7 (3.1-52.1)	-	0	0 (-)	-
<i>p-value</i>		<i>0.017 (0.007)</i>			<i>0.047 (0.025)</i>	
New sex partner (any sex) in the past 12 months^d						
No	153	9.1 (7.5-11.0)	1.00	57	2.8 (2.0-3.9)	1.00
Yes	51	13.0 (8.2-19.9)	1.42 (0.90-2.24)	19	7.3 (3.5-14.6)	2.61 (1.25-5.48)
Missing	6	8.2 (2.7-22.1)	-	0	0 (-)	-
<i>p-value</i>		<i>0.183</i>			<i>0.093</i>	

eTable 3 continued

Characteristic	Number with HPV infection	Males		Number with HPV infection	Females	
		HPV Prevalence, % (95% CI)	Unadjusted Prevalence Ratio (95% CI)		HPV Prevalence, % (95% CI)	Unadjusted Prevalence Ratio (95% CI)
Frequency of vaginal/anal sex in the past 12 months^d						
None	18	3.2 (1.9-5.3)	1.00	6	2.0 (0.6-7.1)	1.00
Once	13	13.3 (8.5-20.2)	4.18 (2.01-8.72)	1	0.7 (0.1-6.3)	0.37 (0.04-3.74)
2-11 times	46	12.4 (9.6-15.8)	3.91 (2.22-6.92)	20	5.4 (2.9-9.9)	2.66 (0.63-11.23)
12-51 times	51	10.3 (7.7-13.5)	3.24 (1.71-6.14)	15	2.5 (1.3-4.6)	1.23 (0.27-5.48)
52-103 times	30	9.0 (6.5-12.3)	2.83 (1.43-5.58)	13	4.2 (1.9-9.0)	2.06 (0.47-9.07)
104-364 times	32	13.7 (8.5-21.4)	4.33 (1.83-10.22)	13	4.4 (1.7-10.8)	2.16 (0.37-12.65)
≥ 365 times	6	14.6 (4.7-37.1)	4.61 (1.53-13.89)	0	0 (-)	NE
Missing	14	9.2 (5.1-16.1)	-	8	2.1 (1.3-3.2)	-
<i>p-value (p-trend)</i>		<i>0.004 (0.017)</i>			<i>0.037 (0.500)</i>	
History of genital herpes/ genital warts^d						
No	192	9.2 (7.5-11.4)	1.00	70	3.3 (2.3-4.8)	1.00
Yes	17	24.2 (13.1-40.4)	2.62 (1.34-5.11)	6	3.3 (1.2-8.8)	1.00 (0.33-2.99)
Missing	1	14.1 (1.2-69.7)	-	0	0 (-)	-
<i>p-value</i>		<i>0.102</i>			<i>0.993</i>	
Current use of birth control pills/hormones^c						
No		-	-	69	1.4 (0.4-5.2)	0.39 (0.10-1.53)
Yes		-	-	7	3.7 (2.5-5.3)	1.00
Missing		-	-	18	5.7 (3.0-10.6)	-
<i>p-value</i>		-			<i>0.093</i>	

Abbreviations: HPV= human papillomavirus. CI= confidence interval.

Note: Ever use of cigarettes was defined for individuals age 14-19 as ever having tried cigarettes and for age 20-69 as lifetime use of ≥100 cigarettes. A current smoker was defined as someone who had smoked a cigarette in the prior 30 days. A former smoker was defined as an ever user who had not smoked a cigarette in the prior 30 days. Current marijuana use was defined as use of marijuana at least once within the past 30 days. Lifetime number of any sex partners (vaginal/anal/oral sex combined) included the number of opposite gender partners. Lifetime and recent number of oral or vaginal sex partners included the sum of same and opposite gender partners.

^a Analyses based on all participants aged 14-69 years with evaluable oral rinse specimens (N=5501).

^b Adjusted Wald F p-values for heterogeneity. P-values for trend shown in parentheses were calculated using the Cochran-Mantel-Haenszel test. Subjects with missing data were excluded from all p-value and prevalence ratio calculations.

^c Analyses for alcohol use were restricted to individuals aged 20 years and older. Analyses for current use of birth control pills/hormones were restricted to women aged 20 years and older.

^d Analyses were restricted to individuals aged 14-59 years who responded to the ACASI questionnaire (N=4191).

^e Analyses were restricted to individuals aged 14-69 years who responded to the ACASI questionnaire (N=4964).

eTable 4: Comparison of demographic and behavioral characteristics by race

Characteristic	n	Mexican-American	n	Other Hispanic	n	Non-Hispanic white	n	Non-Hispanic black	n	Other	p-value
Marital Status											<0.001
Never married	376	33.7 (28.8-39.1)	181	32.6 (29.3-36.1)	607	25.5 (23.0-28.3)	437	43.6 (40.7-46.5)	110	36.6 (29.8-44.0)	
Married/living with partner	550	55.6 (49.4-61.6)	287	53.1 (48.7-57.5)	1173	60.8 (58.2-63.4)	366	39.7 (35.7-43.9)	125	54.3 (47.5-61.0)	
Widowed/divorced/separated	135	10.6 (7.9-14.1)	98	14.2 (11.3-17.9)	325	13.5 (12.0-15.2)	165	16.6 (14.4-19.0)	25	8.9 (4.0-18.5)	
Cigarette Use ^a											0.216
Never/former	875	81.2 (77.0-84.7)	465	81.6 (77.5-85.1)	1536	78.6 (76.3-80.7)	721	73.2 (68.1-77.8)	203	80.1 (69.4-87.6)	
Current, < 10 cigarettes/day	155	15.1 (12.9-17.6)	75	13.8 (10.8-17.6)	267	10.4 (8.8-12.1)	188	20.4 (17.3-24.0)	41	13.9 (8.7-21.4)	
Current, 10-20 cigarettes/day	23	2.7 (1.3-56.7)	19	3.5 (1.7-7.1)	235	8.6 (6.7-10.8)	52	5.6 (3.9-7.9)	14	5.4 (2.1-13.1)	
Current, > 20 cigarettes/day	5	0.7 (0.2-2.0)	4	0.6 (0.1-3.0)	66	2.4 (1.8-3.3)	6	0.6 (0.3-1.5)	3	0.7 (0.2-2.3)	
Ever had sex (vaginal, anal, oral) ^b											0.001
No	177	13.8 (11.2-16.7)	65	9.5 (7.5-11.9)	192	7.9 (6.6-9.4)	110	9.8 (8.2-11.6)	48	15.9 (10.2-24.1)	
Yes	870	85.3 (82.5-87.6)	497	89.9 (87.6-91.8)	1911	92.0 (90.5-93.3)	856	90.0 (88.3-91.5)	212	83.4 (75.3-89.2)	
Ever performed oral sex ^b											<0.001
No	460	38.5 (33.5-43.7)	169	25 (19.8-31.1)	354	14.6 (12.9-16.5)	386	37.0 (32.4-41.8)	104	36.7 (26.7-47.9)	
Yes	586	60.4 (54.9-65.6)	392	74.2 (68.7-79.1)	1744	85.1 (83.2-86.8)	575	62.3 (57.8-66.6)	155	62.5 (51.3-72.4)	
Ever had vaginal sex ^b											<0.001
No	210	16.8 (15.0-18.9)	73	10.3 (8.4-12.4)	225	9.3 (7.9-10.8)	128	11.5 (9.9-13.3)	55	18.3 (11.4-28.1)	
Yes	840	82.3 (80.5-83.9)	487	88.9 (86.8-90.7)	1878	90.7 (89.1-92.0)	839	88.3 (86.6-89.9)	205	81.1 (71.4-88.0)	

eTable 4 continued

Characteristic	n	Mexican-American	n	Other Hispanic	n	Non-Hispanic white	n	Non-Hispanic black	n	Other	p-value
Number of lifetime oral sex partners^c	897		463		1755		804		239		<0.001
Mean (SE)		2.8 (2.3-3.3)		4.1 (3.4-4.8)		7.7 (5.2-10.2)		3.3 (2.7-3.9)		6.3 (0-14.7)	
Number of recent oral sex partners^c	898		461		1759		805		239		<0.001
Mean (SE)		0.9 (0.7-1.1)		1.0 (0.9-1.2)		1.1 (0.9-1.2)		1.0 (0.9-1.2)		0.7 (0.5-0.8)	
Age at oral sex debut, years^c	524		333		1470		496		147		<0.001
Mean (SE)		20.7 (20.0-21.3)		20.1 (19.5-20.8)		19.2 (18.8-19.5)		20.7 (19.9-21.5)		21.4 (20.1-22.7)	
Time since new oral sex partner^c	524		333		1472		496		148		<0.001
Mean (SE)		73.8 (64.5-83.1)		64.6 (54.0-75.2)		112.8 (105.1-120.5)		54.0 (43.9-64.2)		66.8 (46.3-87.3)	
Number of lifetime any sex partners^b	1033		552		2088		953		256		<0.001
Mean (SE)		9.4 (5.9-12.8)		9.4 (8.1-10.7)		11.7 (9.4-14.1)		15.6 (12.0-19.2)		5.8 (3.6-7.9)	
Number of recent any sex partners^c	891		461		1762		804		239		<0.001
Mean (SE)		1.3 (0.9-1.7)		1.3 (1.2-1.5)		1.2 (1.1-1.3)		1.7 (1.5-1.9)		1.0 (0.8-1.2)	

eTable 4 continued

Characteristic	n	Mexican-American	n	Other Hispanic	n	Non-Hispanic white	n	Non-Hispanic black	n	Other	p-value
Number of lifetime vaginal sex partners^c	893		458		1755		804		239		<0.001
Mean (SE)		7.8 (5.8-9.7)		8.4 (7.1-9.8)		10.8 (8.2-13.4)		13.9 (10.5-17.4)		5.0 (3.6-6.5)	
Number of recent vaginal sex partners^c	896		462		1758		804		240		<0.001
Mean (SE)		1.6 (1.3-1.9)		2.3 (1.5-3.1)		1.7 (1.4-2.0)		2.7 (2.3-3.0)		1.6 (1.0-2.1)	

Note: percentages denote column percentages. Values do not add up to 100% because of missing data.

^a Ever use of cigarettes was defined for individuals age 14-19 as ever having tried cigarettes and for age 20-69 as lifetime use of ≥100 cigarettes. A current smoker was defined as someone who had smoked a cigarette in the prior 30 days. A former smoker was defined as an ever user who had not smoked a cigarette in the prior 30 days.

^b Analyses were restricted to individuals aged 14-69 years who responded to the ACASI questionnaire (N=4964).

^c Analyses were restricted to individuals aged 14-59 years who responded to the ACASI questionnaire (N=4191).

eTable 5: Adjusted prevalence ratios for demographic and behavioral characteristics associated with oral HPV infection in NHANES 2009/2010

Characteristic	Overall Adjusted prevalence ratio (95% CI) ^a	Men Adjusted prevalence ratio (95% CI) ^a	Women Adjusted prevalence ratio (95% CI) ^a	p-value for interaction by gender ^a
Education^b				0.021
Less than high-school	1.00	1.00	1.00	
High-school or equivalent	1.10 (0.75-1.60)	1.27 (0.81-2.00)	0.73 (0.33-1.61)	
Some college or greater	1.01 (0.73-1.41)	1.23 (0.82-1.84)	0.60 (0.27-1.35)	
<i>p-value</i>	<i>0.830 (0.941)</i>	<i>0.537 (0.331)</i>	<i>0.455 (0.216)</i>	
Income-to-poverty ratio^b				0.070
<1.0	1.00	1.00	1.00	
≥1.0 to <2.0	0.89 (0.63-1.28)	1.03 (0.78-1.35)	0.68 (0.35-1.32)	
≥2.0 to <3.0	0.88 (0.63-1.21)	1.05 (0.68-1.64)	0.64 (0.26-1.54)	
≥3.0	0.77 (0.56-1.06)	1.06 (0.73-1.55)	0.34 (0.12-0.94)	
<i>p-value (p-trend)</i>	<i>0.462 (0.115)</i>	<i>0.991 (0.761)</i>	<i>0.168 (0.025)</i>	
Alcohol use in the past 12 months, average number of drinks per week^c				0.059
0	1.00	1.00	1.00	
< 1	0.71 (0.44-1.17)	0.84 (0.45-1.57)	0.59 (0.33-1.03)	
1-7	0.69 (0.46-1.03)	0.86 (0.60-1.24)	0.30 (0.11-0.78)	
8-14	0.92 (0.59-1.43)	1.02 (0.62-1.67)	1.05 (0.40-2.77)	
> 14	0.69 (0.44-1.10)	0.82 (0.50-1.34)	0.44 (0.10-2.03)	
<i>P-value (p-trend)</i>	<i>0.049 (0.190)</i>	<i>0.624 (0.570)</i>	<i>0.081 (0.207)</i>	
Marijuana use^d				0.277
Never	1.00	1.00	1.00	
Former	1.04 (0.69-1.57)	1.12 (0.69-1.81)	0.95 (0.48-1.89)	
Current	1.06 (0.61-1.86)	1.04 (0.54-2.02)	1.27 (0.48-3.40)	
<i>p-value (p-trend)</i>	<i>0.973 (0.820)</i>	<i>0.863 (0.869)</i>	<i>0.790 (0.665)</i>	
Ever had sex (vaginal, anal, or oral)^e				0.117
No	1.00	1.00	1.00	
Yes	5.33 (2.40-11.84)	7.23 (2.03-25.76)	3.84 (0.91-16.19)	
<i>p-value</i>	<i><0.001</i>	<i>0.003</i>	<i>0.062</i>	
Ever had oral sex^e				0.242
No	1.00	1.00	1.00	
Yes	1.85 (1.08-3.18)	1.87 (0.98-3.57)	1.65 (0.98-2.79)	
<i>p-value</i>	<i>0.026</i>	<i>0.052</i>	<i>0.059</i>	

eTable 5 continued

Characteristic	Overall Adjusted prevalence ratio (95% CI) ^a	Men Adjusted prevalence ratio (95% CI) ^a	Women Adjusted prevalence ratio (95% CI) ^a	p-value for interaction by gender ^a
Ever had vaginal sex^e				0.152
No	1.00	1.00	1.00	
Yes	3.55 (1.98-6.36)	3.74 (1.86-7.52)	3.41 (1.00-11.66)	
p-value	<0.001	<0.001	0.048	
Ever had anal sex^e				0.135
No	1.00	1.00	1.00	
Yes	1.56 (1.21-2.02)	1.74 (1.24-2.43)	1.03 (0.54-1.95)	
p-value	0.002	0.003	0.919	

^a Age was modeled in the overall models and models among men as restricted cubic splines with 5 knots (age+ three spline terms). Models among women included age as a linear term. P-values for interaction of gender with each term were evaluated in separate (overall) models using product terms.

^b Models were conducted among 4,964 participants aged 14-69 years who responded to the ACASI questionnaire and were adjusted for age (as noted above), gender (as appropriate), race, smoking, marital status, and lifetime number of any sex partners.

^c Models were restricted to individuals aged 20-69 years who responded to the ACASI questionnaire (N=4088) and were adjusted for age (as noted above), gender (as appropriate), race, smoking, marital status, and lifetime number of any sex partners.

^d Models were restricted to individuals aged 14-59 years who responded to the ACASI questionnaire (N=4191) and were adjusted for age (as noted above), gender (as appropriate), race, smoking, marital status, and lifetime number of any sex partners.

^e Models were conducted among 4,964 participants aged 14-69 years who responded to the ACASI questionnaire and were adjusted for age (as noted above), gender (as appropriate), race, smoking, marital status, and the relevant sexual behavior variable.

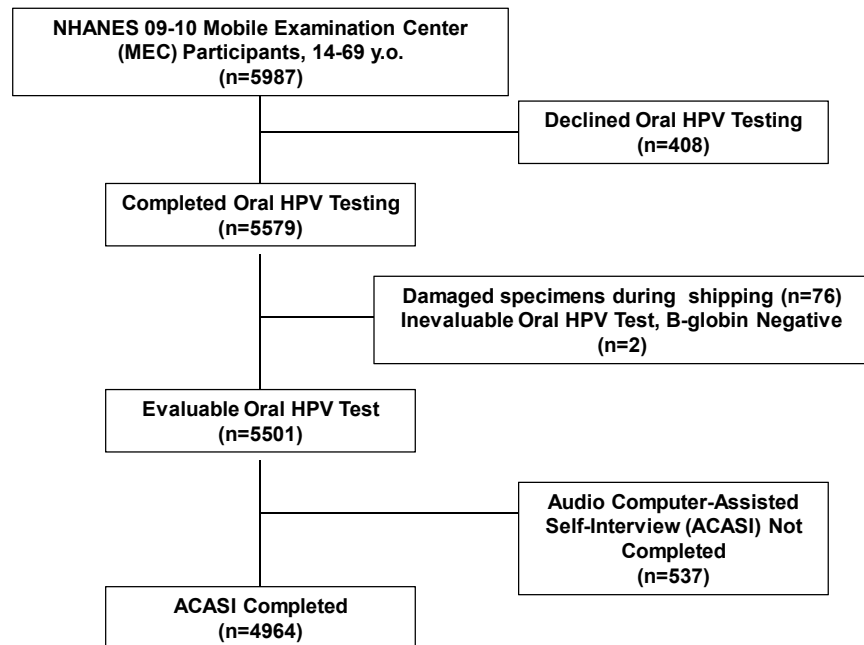
eTable 6: Predictors of high-risk and low-risk oral HPV infections ^a

Characteristic	Low-risk HPV	High-risk HPV	P-value for difference high-risk vs. low-risk
	Adjusted prevalence ratio (95% CI) ^b	Adjusted prevalence ratio (95% CI) ^b	
Age	No association (p=0.688 for age+spline terms)	Bimodal (p<0.001 for age+spline terms)	NA
Gender			0.546
Male	2.08 (1.37-3.14)	2.56 (1.41-4.66)	
Female	1.00	1.00	
<i>p-value</i>	<0.001	0.003	
Race/Ethnicity			0.010
Mexican American	1.72 (1.06-2.80)	0.82 (0.48-1.41)	
Other Hispanic	1.59 (0.73-3.44)	0.89 (0.58-1.38)	
White, Non-Hispanic	1.00	1.00	
Black, Non-Hispanic	2.11 (1.10-4.06)	0.95 (0.71-1.26)	
Other race	1.83 (0.66-5.09)	0.68 (0.23-2.05)	
<i>p-value</i>	0.176	0.960	
Marital Status			0.093
Never married	1.00	1.00	
Married/living with partner	1.03 (0.73-1.45)	0.60 (0.39-0.91)	
Widowed/divorced/separated	1.05 (0.54-2.03)	0.73 (0.45-1.19)	
<i>p-value</i>	0.975	0.072	
Cigarette Use			0.038 (categorical) 0.688 (ordinal)
Never/former	1.00	1.00	
Current, < 10 cigarettes/day	1.13 (0.77-1.65)	1.50 (1.00-2.26)	
Current, 10-20 cigarettes/day	2.55 (1.69-3.83)	1.32 (0.64-2.71)	
Current, > 20 cigarettes/day	1.27 (0.34-4.74)	2.55 (1.37-4.75)	
<i>p-value (p-trend)</i>	0.002 (<0.001)	0.014 (0.021)	
Number of lifetime sex partners (any sex)			0.554 (categorical) 0.190 (ordinal)
0	1.00	1.00	
1	1.48 (0.32-6.89)	4.36 (0.80-23.62)	
2-5	2.15 (0.70-6.58)	9.78 (1.83-52.14)	
6-10	4.39 (1.47-13.07)	16.12 (3.41-76.25)	
11-20	3.09 (0.98-9.77)	17.93 (3.64-88.30)	
≥21	5.92 (1.90-18.47)	35.51 (8.12-155.34)	
<i>p-value (p-trend)</i>	0.016 (<0.001)	<0.001 (<0.001)	

^a Individuals co-infected with both high-risk and low-risk infections were counted under the high-risk category. Analyses were restricted to individuals aged 14-69 years who responded to the ACASI questionnaire (N=4964). High-risk HPV included HPV types 16, 18, 26, 31, 33, 35, 39, 45, 51, 52, 53, 56, 58, 59, 66, 68, 73, and 82. Low-risk HPV included HPV types 6, 11, 38, 40, 42, 54, 55, 61, 62, 64, 67, 69, 70, 71, 72, 81, 83, 84, and cp6108.

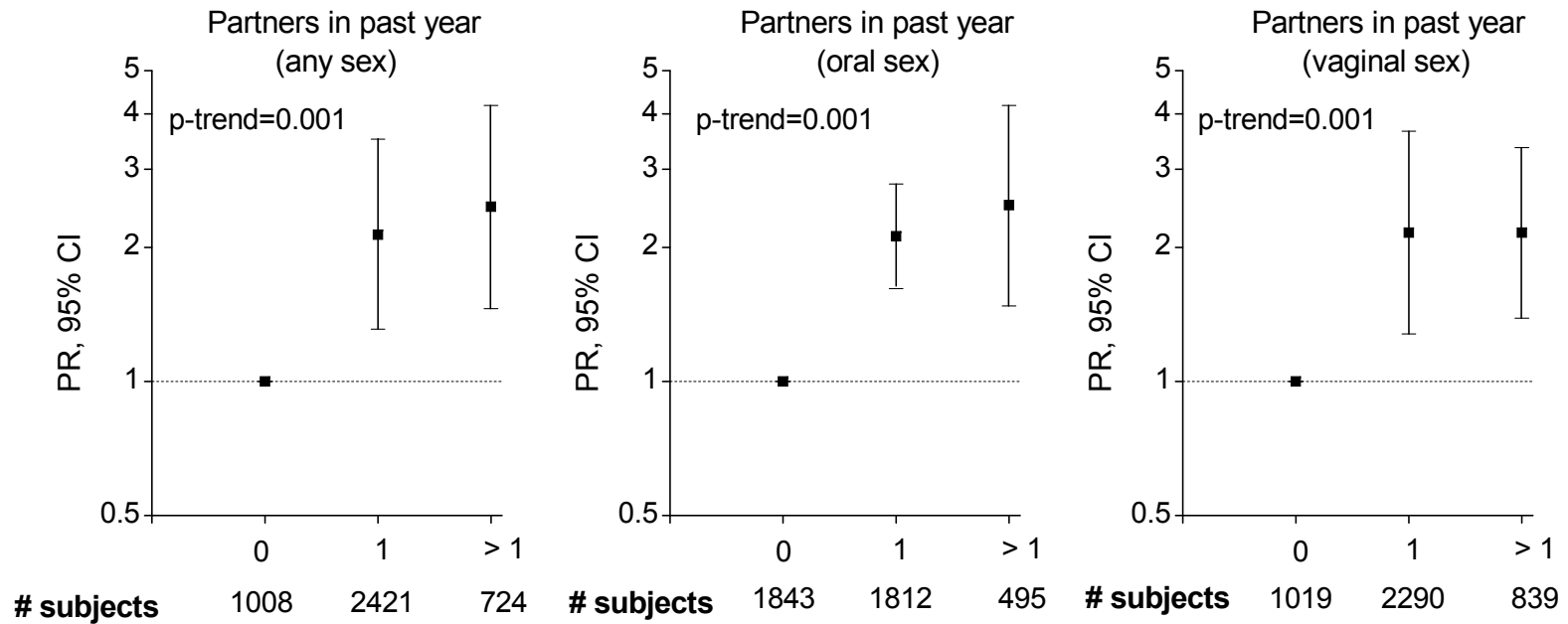
^b Adjusted prevalence ratios were estimated using multinomial logistic regression. Models were adjusted for age modeled as restricted cubic splines with 5 knots (age+ three spline terms), gender, race, marital status, smoking, and lifetime number of any sex partners.

Supplementary Figure 1: Analyses of oral HPV prevalence in NHANES 2009/2010, aged 14-69 years



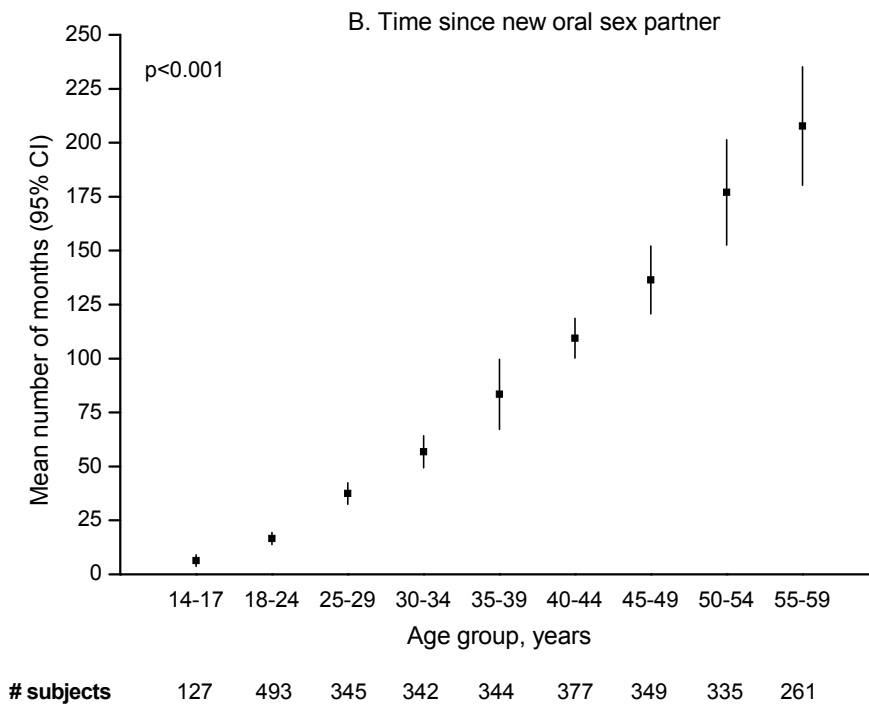
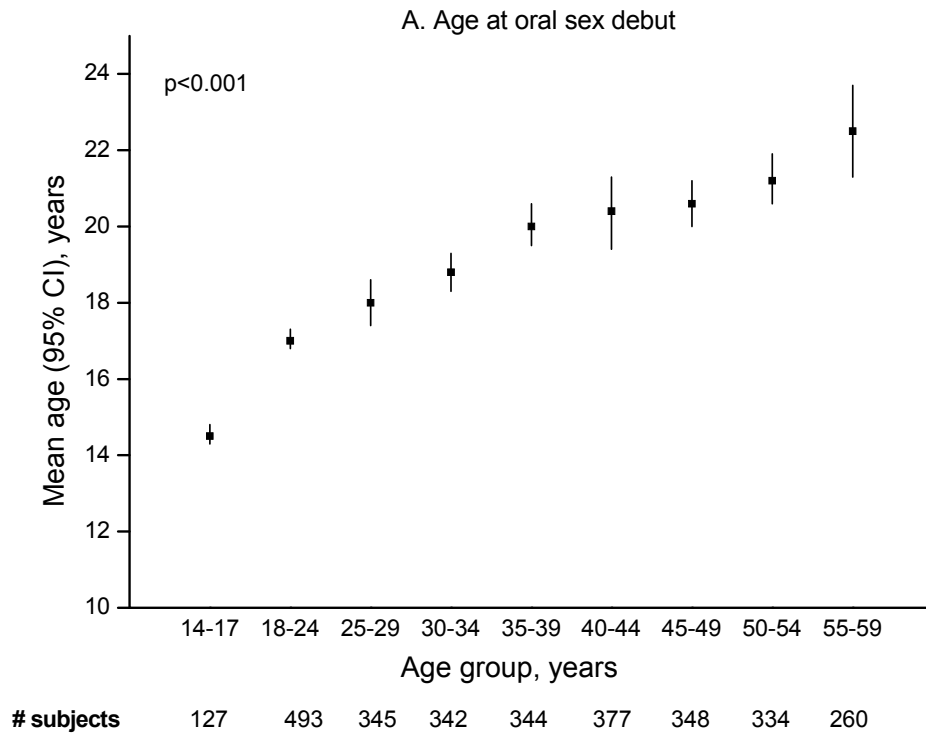
eFigure 1 shows the total NHANES population aged 14-69 years who attended the MEC and reasons for exclusion of subjects from analyses.

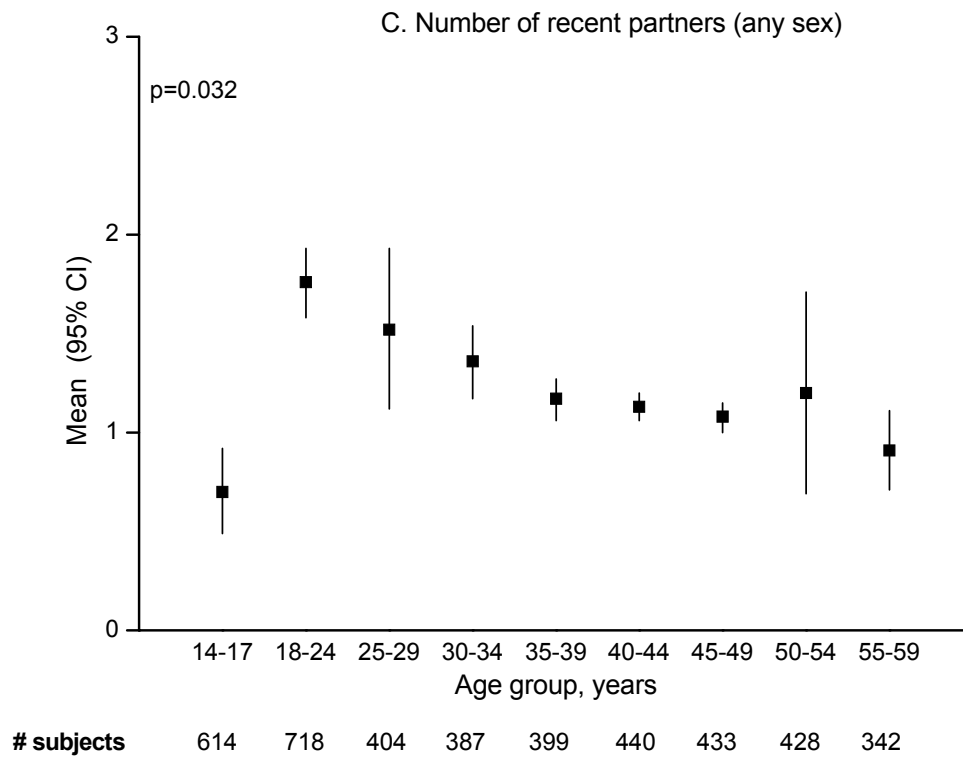
Supplementary Figure 2: Association of recent sexual behavior with oral HPV prevalence



eFigure 2 shows adjusted prevalence ratios and 95% CIs for the association of recent (during the prior 12 months) number of any sex partners (panel A), oral sex partners (panel B), and vaginal sex partners (panel C) with prevalent oral HPV infection. Analyses were conducted among individuals aged 14-59 years who completed the ACASI questionnaire. Associations of each recent sexual behavior were assessed in separate models. All models were adjusted for age (as a linear term), gender, race, marital status, and smoking. The p-values for trend in oral HPV prevalence across sexual behavior categories are also shown in each panel.

Supplementary Figure 3: Associations of sexual behaviors with age





eFigure 3 shows the mean age at sexual debut (panel A), mean time in months since a new oral sex partner (panel B), and mean number of recent (during the past 12 months) any sex partners (panel C) across 5-year age categories. Vertical bars represent 95% confidence intervals around the mean values. The p-values for trends in each characteristic across age categories, estimated from linear regression models, are also shown in each panel.