

Table 2. Summary of results from studies reporting comparative prevalence of HPV between anatomical sites

Author(s), year	Sample size	Population	Cervical HPV			Penile HPV			Anal HPV			Oral HPV		
			Any HPV	HR HPV	HPV 16	Any HPV	HR HPV	HPV 16	Any HPV	HR HPV	HPV 16	Any HPV	HR HPV	HPV 16
Beachler <i>et al.</i> 2013 (30)	n=404	US HIV+/HIV- adults	-	-	-	-	-	-	84%	67%	20.3%	28%	13%	2.3%
Marek <i>et al.</i> 2013 (24)	86	Hungarian females sex trade workers	64.7%	44.1%	-	-	-	-	50.0%	29.4%	-	20.6%	8.8%	-
	n=34 n=52	controls	34.6%	21.2%	-	-	-	-	15.4%	3.8%	-	7.7%	1.9%	-
Schlect <i>et al.</i> 2013 (25)	n=97	US inner-city sexually active adolescent females*	59%	40%	9%	-	-	-	57%	30%	4%	12%	4%	2%
Videla <i>et al.</i> 2013 (31)	n=538	US males HIV+ MSM	-	-	-	25%	19.0%	-	84%	78.8%	-	16%	13.3%	-
	n=195	HIV+ heterosexual	-	-	-	27%	19.9%	-	42%	33.3%	-	19%	18.2%	-
Adamopoulou <i>et al.</i> 2012 (26)	n=43	Greek sexually active adult women	58.1%	39.5%	20.9%	-	-	-	-	-	-	44.2%	32.6%	20.9%
Du <i>et al.</i> 2012 (27)	n=174 (cervical)	High risk youth aged 15-23 attending a youth clinic in Stockholm, Sweden	74.1%	64.9%	37.9%	-	-	-	-	-	-	9.3%	7.4%	2.9%
	n=483 (oral)													
Brown <i>et al.</i> 2011 (28)	n=185	Peruvian female sex workers	65.8%	-	14.6%	-	-	-	-	-	-	7.6%	2.2%	0.5%
Parisi <i>et al.</i> 2011 (32)	n=166	Italian HIV+ MSM	-	-	-	-	-	-	87.5%	20.9%	-	20.7%	24.3%	-
D'Souza <i>et al.</i> 2007 (29)	N=182	US HIV+/HIV-women	68%	51%	7.7%	-	-	-	-	-	-	27%	16%	3.8%
	n=123	HIV+	78%	61%	-							33%	20%	-
	n=59	HIV-	51%	31%	-							15%	6.8%	-
Sirera <i>et al.</i> 2006 (33)	74	Spanish HIV+ men												
	n=52 n=22	HIV+ MSM HIV+ heterosexual	- -	- -	- -	38% 32%	25% 33%	- -	83% 68%	- -	38.4% 18.2%	33% 23%	- -	19.2% 13.6%

HPV = human papillomavirus

HR = high risk type HPV-16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 68, 73

MSM = men who have sex with men

*some of whom reported having received one or more doses of HPV vaccine

Table 3a. Summary of results from studies reporting prevalence of oral HPV in healthy populations

Author(s), year	Sample size	Population	Sample Method	Extraction Method	HPV Detection	Genotyping	Oral HPV Prevalence		
							Any HPV	HR* HPV	HPV 16
Lang Kuhs et al. 2013 (13)	N=5838 n=2912 n=2926	Women aged 22-29 HPV vaccinated Control	Rinse/gargle	MagNAPure LC DNA isolation procedure	HPV SPF10 PCR DNA enzyme immunoassay (DEIA)	Line probe assay (LiPA25) version 1 system	1.6% 1.9%	0.7% 1.3%	0.03% 0.4%
Meyer et al. 2013 (34)	n=129 n=15	Female participants Male partners	Rinse/gargle and brush cytology of tonsil	QIAamp DNA Mini Kit	degenerate primers A5/A10 and A6/A8	Enzyme immunoassay	5.4%	2.3%	-
Nordfors et al. 2013 (35)	n=335	Swedish high school students aged 17-21	Rinse	Genra Puregene Buccal Cell Kit	-	a Luminex- based multiplex assay, using a MAGPIX instrument	1.8%	1.8%	1.2%
Edelstein et al. 2012 (36)	n=212	US male university students 18-25 years	Rinse/gargle and self collected oropharyngeal swab	QIAampDNA blood kit	MY-09-MY11- HMB01	liquid bead microarray assay based on Luminex technology	7.5%	-	2.8%
Gillison et al. 2012 (22)	n=5579	US population	Rinse/gargle	Qiagen Virus/Bacteria Midi kit on QIASymphony	PGMY primer pools and primers for β -globin	Roche LA	6.9%	-	1.0%
Pickard et al. 2012 (37)	n=1000	US young adult university students aged 18-30 years	Rinse/gargle	Qiagen Virus/Bacteria Midi kit on QIASymphony	PGMY primer pools and primers for β -globin	Roche LA	2.4%	1.2%	0.2%

Saunders <i>et al.</i> 2012 (38)	n=4846	US population	Rinse/Gargle	-	-	Multiplex assay	7.3%	3.1%	1.06%
Kreimer <i>et al.</i> 2011 (39)	n=1688	Multinational healthy men	Rinse/Gargle	Qiagen Robotic MDx Media Kit	PGMY09/11	Roche LA	4%	1.3%	.6%
Kreimer <i>et al.</i> 2010 (SR[£]) (40)	18 studies n=4581	Studies from 1997-2009 which evaluated HPV DNA in oral specimens collected from healthy individuals	Varied. Oral rinse/gargle and various brushings.	Varied	Varied	Varied	4.5%	3.5%	1.3%

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Table 3b. Summary of results from studies reporting prevalence of oral HPV in high-risk, healthy populations

Author(s), year	Sample size	Population	Sample Method	Extraction Method	HPV Detection	Genotyping	Oral HPV Prevalence		
							Any HPV	HR* HPV	HPV 16
D'Souza et al. 2014	n=164 n=93	Patients with HPV-OPC And their partners	Rinse	QIA Symphony SP	PGMY 09/11 primers	Roche LA	64.6% 4.3%	61.0% 1.1%	53/0% 0.0%
Kofoed et al. 2014	N=201	Men and women with genital warts	Rinse	MagNA Pure LC using the Total Nucleic Acid kit	modified GP5+/6+ (MGP) primers	Luminex-based HPV genotyping	10.4%	6.6%	-
Marek et al. 2013	86 n=34 n=52	Hungarian females sex trade workers controls	Swab posterior oropharyngeal membrane	Silica extraction done by robot	L1F/L1R primer set	Type-specific solid-phase hybridization	20.6% 7.7%	8.8% 1.9%	- -
Schlect et al. 2013	n=97	US high risk, inner city adolescent females §	Rinse/gargle	-	MY09/MY11	Bot blot hybridization	12%	4%	2%
Adamopoulou et al. 2012	n=43	Greek sexually active adult women some with cervical cytology findings	Rinse/gargle	Nucleospin™ DNA isolation kit	MY09/MY11	1. digesting the PCR am- plification products with restriction endonucleases Dde I, Hinf I, Pst I, Rsa I 2. nested PCR Ampliquity HPV-HS	11.6% 44.2%	7.0% 32.6%	4.7% 20.9%
Du et al. 2012	n=483	High risk youth aged 15-23 attending a youth clinic in Stockholm, Sweden*	Rinse/gargle	Genra Puregene Buccal Cell Kit	-	a Luminex- based multiplex assay, using a MAGPIX instrument	9.3%	7.2%	2.9%

Ratuva et al. 2012	n=324	Finnish pregnant women	Oral brushings	Multimetrix kit	MY09/MY11 GP05+/GP06+	Luminex LX-100 analyzer	15-24%	-	9.7-18.4%
Termine et al. 2012	n=98	Italian women with cervical HPV infection	Rinse/gargle	Puregene	SPF10	LiPA	14.3%	-	-
Brown et al. 2011	n=185	Peruvian female sex workers	Rinse/gargle	QIAamp KNA blood kit	PGMY09/11	Roche LA	7.6%	2.2%	0.5%

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§2/3 of which reported having received 1 or more doses of HPV vaccine

Table 3c. Summary of results from studies reporting prevalence of oral HPV in high-risk, HIV+ populations

Author(s), year	Sample size	Population	Sample Method	Extraction Method	HPV Detection	Genotyping	Oral HPV Prevalence		
							Any HPV	HR* HPV	HPV 16
Darwich et al. 2013 (41)	n=538	HIV+ MSM	Brush/Rinse	QIAamp Viral DNA kit	-	F-HPV typing™ multiplex PCR	16%	-	3.7%
	n=195	HIV+ male heterosexuals					19%	-	7.8%
Beachler et al. 2013 (30)	n=404	US HIV+/HIV- adults	Rinse/gargle	Puregene DNA purification kit	PGYM09/11	reverse line blot hybridization (Roshe)	28%	13%	2.3%
Mooij et al. 2013 (42)	n=314	Dutch MSM aged ≥ 18 years HIV+	Rinse/gargle	MagNA Pure LC Total Nucleic Acid Isolation Kit	DNA Enzyme Immuno Assay	Reverse- hybridization line probe assay (LiPA25)	56.7%	24.8%	-
	n=453	HIV-					27.6%	8.8%	-
Videla et al. 2013 (31)	n=538	US males HIV+ MSM	Rinse/gargle + Cytobrushing combined into a single sample	Qiapm Viral DNA kit	-	commercial IVD- CE <i>F-HPV</i> typing	16%	13.3%	-
	n=195	HIV+ heterosexual					19%	18.2%	-
Beachler et al. 2012 (43)		US HIV+ /at-risk HIV- adults	Rinse/gargle	QIA Symphony SP	PGMY09/11	Roche LA			
	n=192	HIV+ men					45%	23%	6.8%
	n=187	HIV+ women					35%	18%	5.4%
	n=266	HIV- men					28%	17%	6.9%
	n=93	HIV- women	18%	8.6%	2.2%				
Parisi et al. 2011 (32)	n=166	Italian HIV+ MSM	Oral swab	QIAamp DNA Mini Kit	MY09/MY11 GP5+/GP6+	BigDye1 Terminator v3.1 Cycle Sequencing Kit on a 3100 Genetic Analyser	20.7%	24.3%	-

Read <i>et al.</i> 2012 (44)	n=249 n=251	US MSM HIV+ MSM HIV- MSM	Oral Swab and Rinse/gargle	MagNA Pure LC	PGMY09/11	Roche LA	19% 7%	8% 2%	4% 0.8%
Steinau <i>et al.</i> 2012 (11)	n=100	US HIV+ patients >18 years old	Rinse/gargle Buccal Swab Tonsil Swab Lesion Brushing	MagnaPure Kit	PFMY09/11	Roche LA	39% 13% 13% 57.1%	24% 8% 9.4% 42.9%	3% - - -
Bottalico <i>et al.</i> 2011 (46)	n=52 n=317	HIV+ individuals HIV- older males	Rinse/gargle	-	MY09/11 or FAP59/64	Dot blot for 47 types	67% 37%	- -	- -
Fakhry <i>et al.</i> 2010 (47)	n=112 2 weeks 6 months	US HIV+ patients	Rinse/gargle	Puregene DNA kit	PGMY09/11	Roche LA	45% 47.3%	- -	- -
D'Souza <i>et al.</i> 2007 (29)	N=182 n=123 n=59	US HIV+/HIV-women HIV+ HIV-	Rinse/gargle	Puregene DNA kit	PGMY09/11	Roche LA	27% 33% 15%	16% 20% 6.8%	3.8% - -

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HR = high risk type HPV-16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 68, 73

HIV+ = human immunodeficiency virus positive

MSM = men who have sex with men