

# United States Cancer Statistics

# DATA BRIEF

No. 2

March 2018

## Cancers associated with human papillomavirus by state, 2010–2014

Human papillomavirus (HPV) causes almost all cervical cancers, as well as some cancers of the vagina, vulva, penis, anus, and oropharynx (cancers of the back of the throat, including the base of the tongue and tonsils). In this report, **HPV-associated cancers** are defined as those that occur in parts of the body and cancer cell types where HPV is often found because cancer registries do not routinely collect information about HPV status.

The following tables present the average annual age-adjusted rate and number of cases by sex, cancer type, and state for the time period 2010 to 2014. HPV-associated cancer incidence rates ranged by state from 7.9 per 100,000 persons (Utah) to 15.3 (Kentucky).

### Annual rate and number of HPV-associated cancer cases by sex, cancer type, and state, 2010–2014

Cancer Site	Sex	Alabama		Alaska		Arizona		Arkansas		California		Colorado	
		Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases
Cervix	Female	8.1	208	5.9	20	6.0	193	9.3	139	7.0	1,366	5.7	150
Vagina	Female	0.6	17	†	†	0.3	11	0.5	9	0.4	90	0.4	10
Vulva	Female	1.9	56	2.2	6	1.2	50	2.2	41	1.4	301	1.6	46
Penis	Male	0.9	22	†	†	0.6	19	0.9	14	0.8	133	0.6	15
Anus*	Overall	1.7	98	1.7	11	1.3	99	1.9	63	1.7	682	1.6	91
	Female	2.1	64	2.1	†	1.7	68	2.5	44	2.0	430	2.1	64
	Male	1.3	34	1.3	†	0.9	31	1.2	19	1.3	252	1.0	27
Oropharynx	Overall	5.2	301	4.1	32	3.9	301	5.6	196	4.0	1,628	4.3	256
	Female	2.1	63	1.8	6	1.4	57	2.2	40	1.3	288	1.5	44
	Male	8.7	238	6.1	26	6.6	244	9.4	156	6.9	1,340	7.3	212
All HPV-associated cancers	Overall	12.9	702	10.5	73	9.3	673	14.1	462	10.6	4,200	10.1	568
	Female	14.7	408	12.7	41	10.6	379	16.7	273	12.2	2,475	11.3	314
	Male	11.0	294	8.1	32	8.1	294	11.5	189	9.0	1,725	9.0	254

All HPV-associated cancers includes carcinomas of the cervix and squamous cell carcinomas of the vagina, vulva, penis, anus (including rectal squamous cell carcinoma), and oropharynx.



U.S. Department of Health and Human Services  
Centers for Disease Control and Prevention

Cancer Site	Sex	Connecticut		Delaware		District of Columbia		Florida		Georgia		Hawaii	
		Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases
Cervix	Female	6.6	127	8.0	41	9.3	29	8.1	867	7.3	376	6.9	49
Vagina	Female	0.4	11	†	†	†	†	0.4	57	0.5	29	†	†
Vulva	Female	2.1	51	2.8	16	1.8	6	1.7	233	2.2	118	1.0	9
Penis	Male	0.9	16	1.0	†	†	†	0.7	83	0.8	33	0.5	†
Anus*	Overall	1.6	70	2.0	21	3.1	20	2.3	558	2.0	207	1.1	19
	Female	2.0	47	2.5	†	2.5	†	2.7	365	2.3	129	1.3	†
	Male	1.2	23	1.5	†	3.7	†	1.7	193	1.6	78	0.9	†
Oropharynx	Overall	4.7	212	5.3	60	4.3	27	6.1	1,561	5.1	548	3.8	65
	Female	1.8	42	2.0	12	2.4	8	2.2	303	1.9	105	1.0	9
	Male	8.0	170	8.9	48	6.7	19	10.4	1,258	8.8	443	6.8	56
All HPV-associated cancers	Overall	11.5	487	13.5	145	13.9	86	14.0	3,359	12.7	1,311	9.3	148
	Female	12.9	278	15.6	85	16.5	54	15.2	1,825	14.2	757	10.4	82
	Male	10.1	209	11.4	60	11.1	32	12.8	1,534	11.2	554	8.2	66
Cancer Site	Sex	Idaho		Illinois		Indiana		Iowa		Kansas		Kentucky	
		Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases
Cervix	Female	6.3	48	7.4	507	7.4	248	6.9	104	7.1	99	8.5	193
Vagina	Female	0.5	4	0.5	42	0.5	20	0.5	9	0.4	6	0.7	19
Vulva	Female	2.0	17	2.2	167	2.5	98	2.9	57	2.3	39	3.2	83
Penis	Male	0.6	4	0.8	45	0.8	24	1.0	16	1.0	13	1.3	28
Anus*	Overall	1.9	34	1.7	241	1.8	135	1.7	60	1.7	55	2.1	104
	Female	2.8	26	2.0	156	2.5	96	2.3	43	2.2	39	2.7	71
	Male	1.0	8	1.3	85	1.1	39	1.0	17	1.1	16	1.4	33
Oropharynx	Overall	4.6	83	4.9	719	5.3	397	4.7	176	4.7	156	6.2	329
	Female	1.7	16	1.8	139	1.8	70	1.8	34	1.5	25	2.3	63
	Male	7.5	67	8.3	580	9.1	327	7.8	142	8.2	131	10.5	266
All HPV-associated cancers	Overall	11.2	190	12.2	1,721	12.9	922	12.1	422	11.8	368	15.3	756
	Female	13.2	111	13.9	1,011	14.7	532	14.4	247	13.5	208	17.3	429
	Male	9.1	79	10.4	710	11.0	390	9.7	175	10.3	160	13.2	327



Cancer Site	Sex	Louisiana		Maine		Maryland		Massachusetts		Michigan		Minnesota	
		Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases
Cervix	Female	8.6	202	5.8	43	6.1	198	5.1	185	6.3	323	5.3	149
Vagina	Female	0.6	16	0.5	5	0.4	15	0.4	17	0.4	28	0.4	13
Vulva	Female	2.4	62	3.1	28	2.0	71	2.4	102	2.5	154	2.3	75
Penis	Male	1.1	23	1.2	10	0.6	17	1.0	31	0.7	35	1.0	27
Anus*	Overall	1.8	90	1.6	30	1.5	103	1.7	138	1.7	195	1.4	89
	Female	2.1	57	2.0	20	1.9	71	2.1	88	2.1	132	1.9	62
	Male	1.4	33	1.3	10	1.0	32	1.4	50	1.2	63	0.9	27
Oropharynx	Overall	5.4	283	5.7	105	4.2	290	5.1	415	4.7	579	4.2	272
	Female	2.0	53	2.5	23	1.5	53	2.1	92	1.8	112	1.6	53
	Male	9.3	230	9.3	82	7.4	237	8.5	323	7.9	467	7.0	219
All HPV-associated cancers	Overall	13.7	676	12.8	221	10.6	694	11.5	888	11.5	1,314	10.2	625
	Female	15.6	390	13.8	119	12.0	408	12.0	484	13.1	749	11.5	352
	Male	11.8	286	11.8	102	9.1	286	10.9	404	9.8	565	8.9	273
Cancer Site	Sex	Mississippi		Missouri		Montana		Nebraska		Nevada		New Hampshire	
		Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases
Cervix	Female	9.4	145	8.0	251	5.8	32	7.0	63	†	†	4.5	33
Vagina	Female	0.8	14	0.5	18	†	†	0.5	5	†	†	†	†
Vulva	Female	2.6	44	2.4	91	1.6	10	2.5	27	†	†	2.0	18
Penis	Male	1.1	16	0.8	23	0.6	†	0.9	9	†	†	0.8	†
Anus*	Overall	1.9	63	2.0	141	1.7	21	1.5	31	†	†	1.7	29
	Female	2.3	41	2.3	89	2.3	†	2.0	21	†	†	2.3	†
	Male	1.5	22	1.6	52	1.0	†	1.0	10	†	†	1.1	†
Oropharynx	Overall	5.5	191	5.4	392	4.8	61	4.0	84	†	†	5.3	93
	Female	2.2	38	1.9	72	2.0	12	1.3	14	†	†	2.0	17
	Male	9.4	153	9.2	320	7.6	49	6.8	70	†	†	8.8	76
All HPV-associated cancers	Overall	14.7	473	13.4	916	10.7	131	11.0	219	†	†	10.9	180
	Female	17.2	282	15.2	521	12.1	72	13.2	130	†	†	11.1	90
	Male	12.0	191	11.6	395	9.2	59	8.7	89	†	†	10.7	90



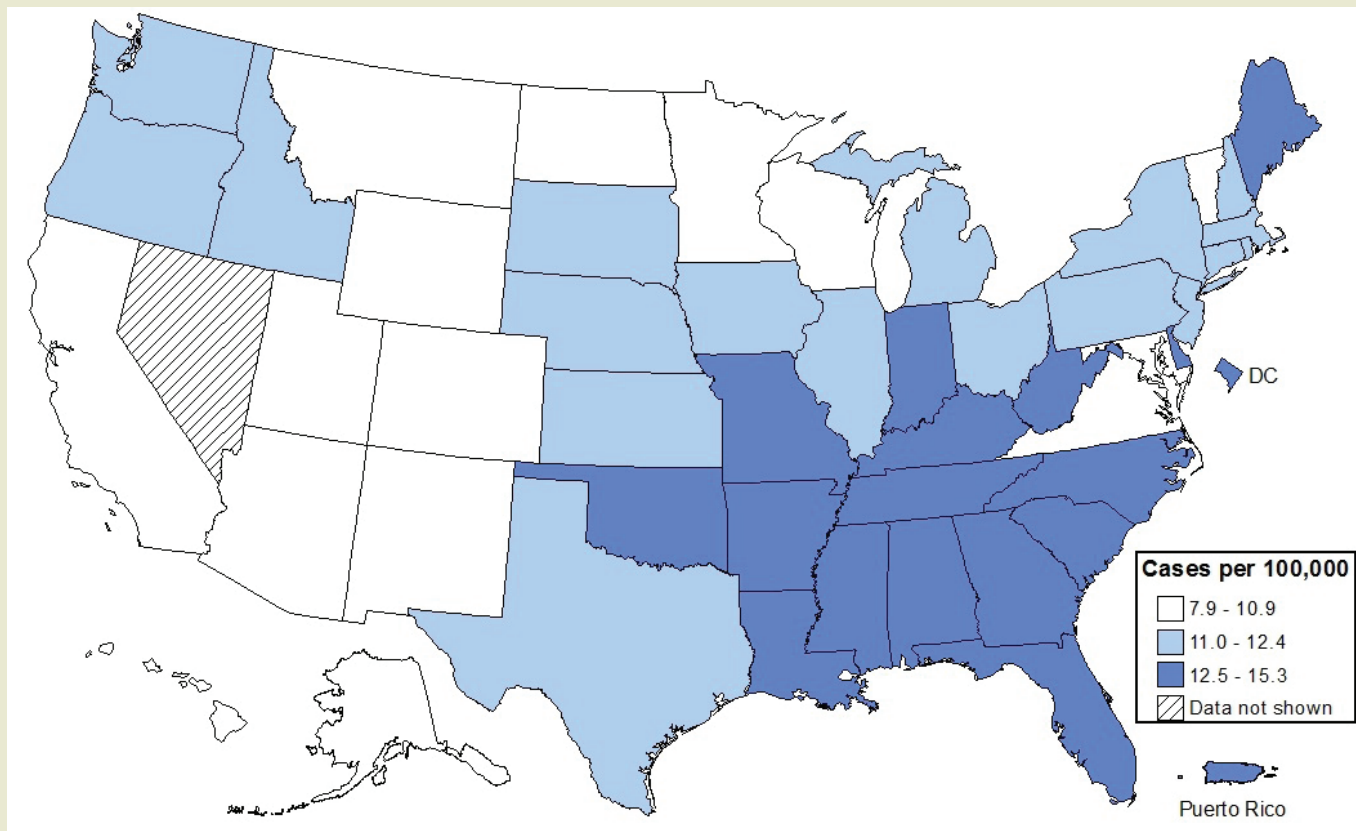
Cancer Site	Sex	New Jersey		New Mexico		New York		North Carolina		North Dakota		Ohio	
		Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases
Cervix	Female	7.3	361	7.2	75	7.4	804	6.9	361	4.9	16	7.1	432
Vagina	Female	0.5	26	0.5	6	0.4	52	0.5	33	†	†	0.4	32
Vulva	Female	2.0	111	1.4	19	1.9	232	2.4	138	2.5	11	2.5	182
Penis	Male	0.8	34	0.9	10	0.9	82	0.8	37	0.9	†	0.9	52
Anus*	Overall	1.6	170	1.5	36	1.9	432	1.8	196	1.0	†	1.7	241
	Female	2.1	119	2.0	25	2.2	272	2.2	131	1.5	†	2.2	166
	Male	1.1	51	1.0	11	1.6	160	1.3	65	†	†	1.2	75
Oropharynx	Overall	4.1	436	3.3	85	4.0	926	5.6	645	3.9	32	4.9	703
	Female	1.5	85	1.3	16	1.6	195	2.0	125	1.2	5	1.8	135
	Male	7.0	351	5.6	69	6.8	731	9.6	520	6.7	27	8.3	568
All HPV-associated cancers	Overall	11.2	1,138	10.0	231	11.5	2,528	12.9	1,410	9.1	72	12.2	1,642
	Female	13.3	702	12.3	141	13.5	1,555	14.1	788	10.3	40	14.0	947
	Male	8.9	436	7.5	90	9.2	973	11.6	622	8.2	32	10.3	695
Cancer Site	Sex	Oklahoma		Oregon		Pennsylvania		Rhode Island		South Carolina		South Dakota	
		Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases
Cervix	Female	8.7	162	6.2	125	7.1	491	6.6	37	7.3	181	6.9	28
Vagina	Female	0.4	10	0.4	10	0.4	37	†	†	0.3	9	†	†
Vulva	Female	2.4	53	1.8	44	2.6	221	3.3	23	2.7	76	2.0	10
Penis	Male	0.7	14	0.7	14	0.8	52	0.9	†	0.8	18	1.1	†
Anus*	Overall	2.1	88	2.1	100	1.8	281	1.8	22	1.8	98	1.4	13
	Female	2.7	61	2.8	69	2.2	187	2.1	†	2.1	64	2.0	†
	Male	1.4	27	1.4	31	1.3	94	1.3	†	1.3	34	0.9	†
Oropharynx	Overall	5.0	218	5.0	247	4.9	784	4.5	59	5.6	327	5.0	49
	Female	1.7	39	1.8	44	1.9	164	1.9	13	2.2	64	1.9	9
	Male	8.5	179	8.5	203	8.1	620	7.4	46	9.6	263	8.1	40
All HPV-associated cancers	Overall	13.3	545	11.8	540	12.3	1,866	12.0	148	13.2	709	11.5	108
	Female	15.9	325	13.0	292	14.2	1,100	14.2	90	14.6	394	13.0	59
	Male	10.6	220	10.6	248	10.1	766	9.6	58	11.7	315	10.1	49



Cancer Site	Sex	Tennessee		Texas		Utah		Vermont		Virginia		Washington	
		Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases
Cervix	Female	8.2	281	8.3	1,070	5.0	62	4.4	15	6.0	259	6.5	231
Vagina	Female	0.5	20	0.4	53	0.3	4	†	†	0.4	19	0.4	17
Vulva	Female	2.5	95	1.5	203	1.2	14	2.2	10	1.9	91	1.9	78
Penis	Male	0.9	31	0.9	105	0.7	7	†	†	0.9	31	0.6	21
Anus*	Overall	2.1	159	1.4	361	1.3	32	2.0	17	1.7	156	1.9	150
	Female	2.6	105	1.7	229	1.7	21	2.2	†	2.2	109	2.5	105
	Male	1.6	54	1.1	132	0.9	11	1.8	†	1.1	47	1.2	45
Oropharynx	Overall	5.2	403	4.2	1,114	2.9	74	4.9	43	4.5	428	4.8	392
	Female	1.7	70	1.5	205	0.8	11	1.5	7	1.5	71	1.8	74
	Male	9.0	333	7.1	909	5.2	63	8.5	36	7.9	357	8.0	318
All HPV-associated cancers	Overall	13.6	989	11.3	2,906	7.9	193	10.7	88	10.9	984	11.5	889
	Female	15.5	571	13.4	1,760	9.0	112	10.5	42	11.9	549	13.2	505
	Male	11.5	418	9.2	1,146	6.8	81	11.0	46	9.8	435	9.9	384
Cancer Site	Sex	West Virginia		Wisconsin		Wyoming		Puerto Rico		United States (including Puerto Rico)		United States (excluding Puerto Rico)	
		Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases
Cervix	Female	9.4	93	6.0	180	7.4	20	12.2	239	7.2	11,909	7.2	11,670
Vagina	Female	0.6	8	0.4	13	†	†	0.7	15	0.4	848	0.4	833
Vulva	Female	2.6	32	2.1	76	2.0	7	1.5	35	2.0	3838	2.0	3802
Penis	Male	1.2	13	0.8	24	†	†	2.4	48	0.8	1288	0.8	1240
Anus*	Overall	2.1	50	1.4	98	1.2	†	1.5	66	1.8	6,285	1.8	6,220
	Female	2.9	36	1.9	66	1.8	†	2.0	49	2.2	4,163	2.2	4,114
	Male	1.2	14	1.0	32	†	†	0.9	17	1.3	2,122	1.3	2,106
Oropharynx	Overall	5.6	138	4.6	324	4.0	28	3.3	150	4.7	17,423	4.7	17,273
	Female	1.8	23	1.9	68	1.7	6	0.9	22	1.7	3,319	1.7	3,297
	Male	9.6	115	7.5	256	6.2	22	6.3	128	8.0	14,104	8.0	13,976
All HPV-associated cancers	Overall	14.7	334	10.8	715	10.4	66	13.6	553	11.9	41,591	11.9	41,038
	Female	17.3	192	12.2	403	13.4	40	17.3	360	13.6	24,077	13.5	23,716
	Male	12.1	142	9.3	312	7.5	26	9.6	193	10.1	17,514	10.1	17,322



**Rate (cases per 100,000 persons) of all HPV-associated cancers combined (cervical carcinoma and squamous cell carcinomas of the vagina, vulva, penis, anus,\* and oropharynx) by state, 2010–2014**



Incidence rates are per 100,000 persons and were age-adjusted to the 2000 U.S. standard population.

\*Rates and counts were suppressed if data did not meet criteria for high data quality or if there were fewer than 16 cases during the time period. Some counts were suppressed as complementary cell suppression. More information can be found at [www.cdc.gov/cancer/npcr/uscs/technical\\_notes](http://www.cdc.gov/cancer/npcr/uscs/technical_notes).

Additional maps can be found at [www.cdc.gov/cancer/hpv/statistics/state](http://www.cdc.gov/cancer/hpv/statistics/state).

**Data source:**

Data from cancer registries participating in CDC’s National Program of Cancer Registries and/or NCI’s Surveillance, Epidemiology, and End Results program that met data quality criteria for 2010–2014, covering 99% of the U.S. population. The analysis and methods were based on: Viens et al. Human Papillomavirus-Associated Cancers — United States, 2008–2012. *MMWR* 2016;65(26):661–666.

**Notes about the data:**

Population-based cancer registries do not routinely collect information about HPV status; however, the data can be used to monitor the number of cancers associated with HPV.

An **HPV-associated cancer** is a specific cellular type of cancer that is diagnosed in a part of the body where HPV is often found. These parts of the body include the cervix, vagina, vulva, penis, anus, and oropharynx (back of the throat, including the base of the tongue and tonsils). These cancer cell types include *carcinomas* of the cervix and *squamous cell carcinomas* of the vagina, vulva, penis, anus (including rectal squamous cell carcinoma), and oropharynx.

\*Includes anal and rectal squamous cell carcinomas.

**For more information about**

- HPV: <https://www.cdc.gov/STD/HPV/STDFact-HPV.htm>
- HPV vaccines: <https://www.cdc.gov/hpv/parents/vaccine.html>
- HPV cancers: <https://www.cdc.gov/cancer/hpv/>

**Suggested citation**

Centers for Disease Control and Prevention. Cancers associated with human papillomavirus by state, 2010–2014. USCS data brief, no. 2. Atlanta, GA: Centers for Disease Control and Prevention. 2018.

