Human Papillomavirus and Related Diseases Report

UNITED STATES OF AMERICA

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ICO
Institut Català d'Oncologia

Executive summary

Human papillomavirus (HPV) infection is now a well-established cause of cervical cancer and there is growing evidence of HPV being a relevant factor in other anogenital cancers (anus, vulva, vagina and penis) and head and neck cancers. HPV types 16 and 18 are responsible for about 70% of all cervical cancer cases worldwide. HPV vaccines that prevent against HPV 16 and 18 infection are now available and have the potential to reduce the incidence of cervical and other anogenital cancers.

This report provides key information for United States of America on cervical cancer, other anogenital cancers and head and neck cancers, HPV-related statistics, factors contributing to cervical cancer, cervical cancer screening practices, and HPV vaccine introduction. The report is intended to strengthen the guidance for health policy implementation of primary and secondary cervical cancer prevention strategies in the country.

Table 1: Key Statistics

Population			
Women at risk for cervical cancer (Female population aged >=15 yrs)			140.5 million
Burden of cervical cancer and other HPV-related cancers			
Annual number of cervical cancer cases			13545
Annual number of cervical cancer deaths			5706
Crude incidence rates per 100,000 population:		Male	Female
	Cervical cancer	-	8.10
	Anal cancer	1.72	3.35
	Vulva cancer	-	3.66
	Vaginal cancer	-	0.86
	Penile cancer	0.92	-
	Oropharyngeal cancer	6.41	1.36
	Oral cavity cancer	10.0	4.81
	Laryngeal cancer	6.08	1.55
Burden of cervical HPV infection			
Prevalence (%) of HPV 16 and/or HPV 18 among women with:			
	Normal cytology		3.9
	Low-grade cervical lesions (LSIL/CIN-1)		24.7
	High-grade cervical lesions (HSIL/CIN-2/CIN-3/CIS)		57.9
	Cervical cancer		71.2
Other factors contributing to cervical cancer			
Smoking prevalence (%) [95% UI], women			18.1 [14.2-22.2]
Total fertility rate (live births per women)			1.9
Oral contraceptive use (%)			11.4
HIV prevalence (%) [95% UI], women (15-49 years)			- [—]
Sexual behaviour			
Percentage of 15-year-old who have had sexual intercourse (men/women)			18.0/13.0
Range of median age at first sexual intercourse (men/women)			16.8/17.2
Cervical screening practices and recommendations			
Existence of official national recommendations			Yes
Starting year of current recommendations			2018
Active invitation to screening			No
Screening ages (years), primary screening test used, and screening interval or frequency of screenings			21-29 (cytology, 3 years); 30-65 (cytology, 3 years); 30-65 (HPV test, 5 years); 30-65 (cytology OR HPV test, 5 years)
HPV vaccine in females			
HPV vaccination programme			Introduced
Year of introduction			2006
Year of estimation of HPV vaccination coverage			2021
HPV coverage – first dose (%)			71
HPV coverage – last dose (%)			48

* Please see the specific sections for more information.

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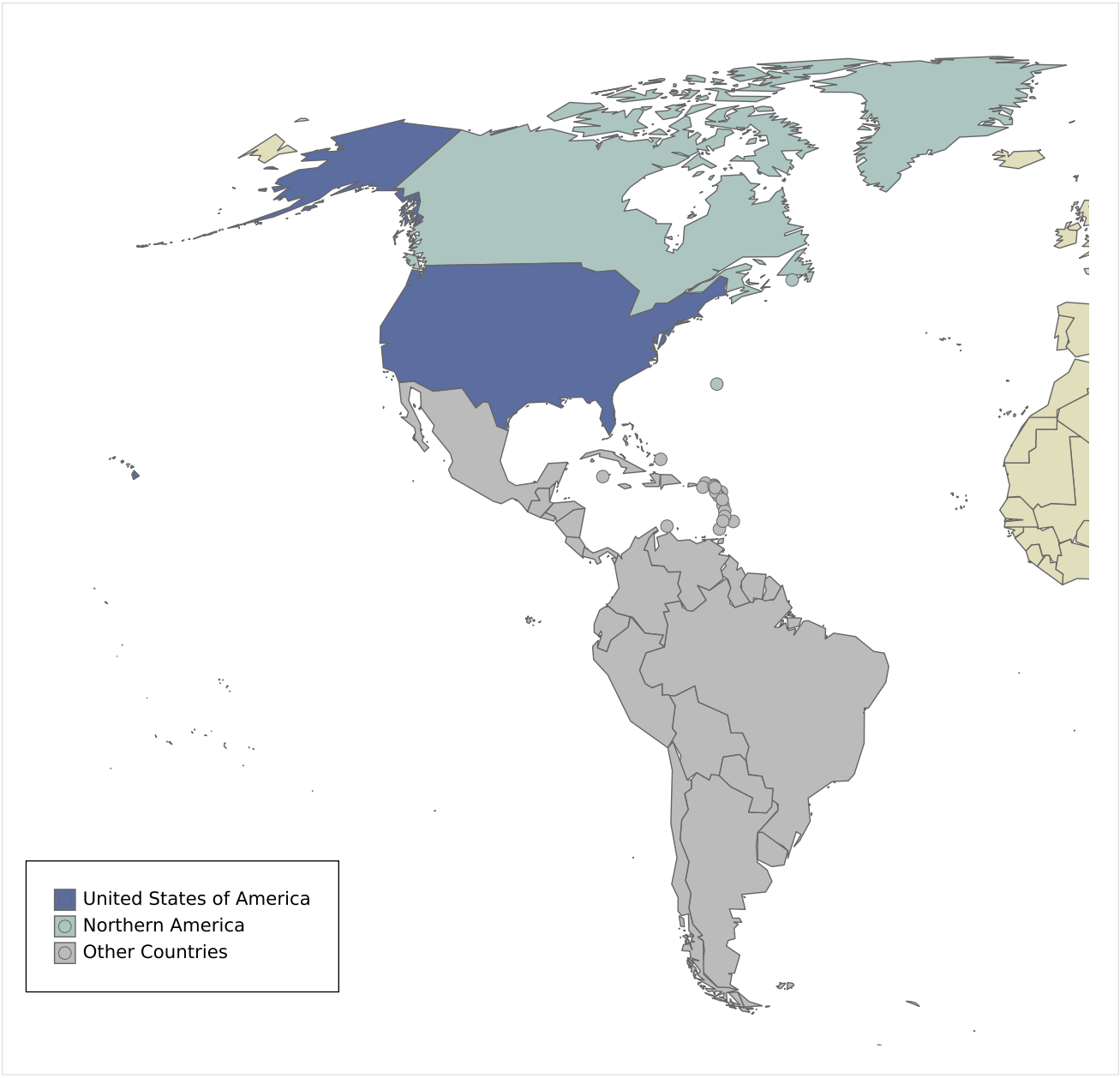
1 Introduction

Figure 1: United States of America and Northern America



Information Centre aims to compile and centralise updated data and statistics on human papillomavirus (HPV) and related cancers. This report aims to summarise the data available to fully evaluate the burden of disease in United States of America and to facilitate stakeholders and relevant bodies of decision makers to formulate recommendations on the prevention of cervical cancer and other HPV-related cancers. Data include relevant cancer statistic estimates, epidemiological determinants of cervical cancer such as demographics, socioeconomic factors, risk factors, burden of HPV infection in women and men, cervical screening and immunization practices. The report is structured into the following sections:

Section 2, Demographic and socioeconomic factors. This section summarises the socio-demographic profile of United States of America. For analytical purposes, United States of America is classified in the geographical region of Northern America (Figure 1, lighter blue), which is composed of the following countries: Canada, Greenland, and Saint Pierre and Miquelon. Throughout the report, United States of America estimates will be complemented with corresponding regional estimates.

Section 3, Burden of HPV related cancers. This section describes the current burden of invasive cervical cancer and other HPV-related cancers in United States of America ith estimates of prevalence, incidence, and mortality rates. Information in other HPV-related cancers includes other anogenital cancers (anus, vulva, vagina, and penis) and head and neck cancers (oral cavity, oropharyngeal, and larynx).

Section 4, HPV related statistics. This section reports on prevalence of HPV and HPV type-specific distribution in United States of America, in women with normal cytology, precancerous lesions and invasive cervical cancer. In addition, the burden of HPV in other anogenital cancers (anus, vulva, vagina, and penis), head and neck cancers (oral cavity, oropharynx, and larynx) and men are presented.

Section 5, Factors contributing to cervical cancer. This section describes factors that can modify the natural history of HPV and cervical carcinogenesis such as smoking, parity, oral contraceptive use, and co-infection with HIV.

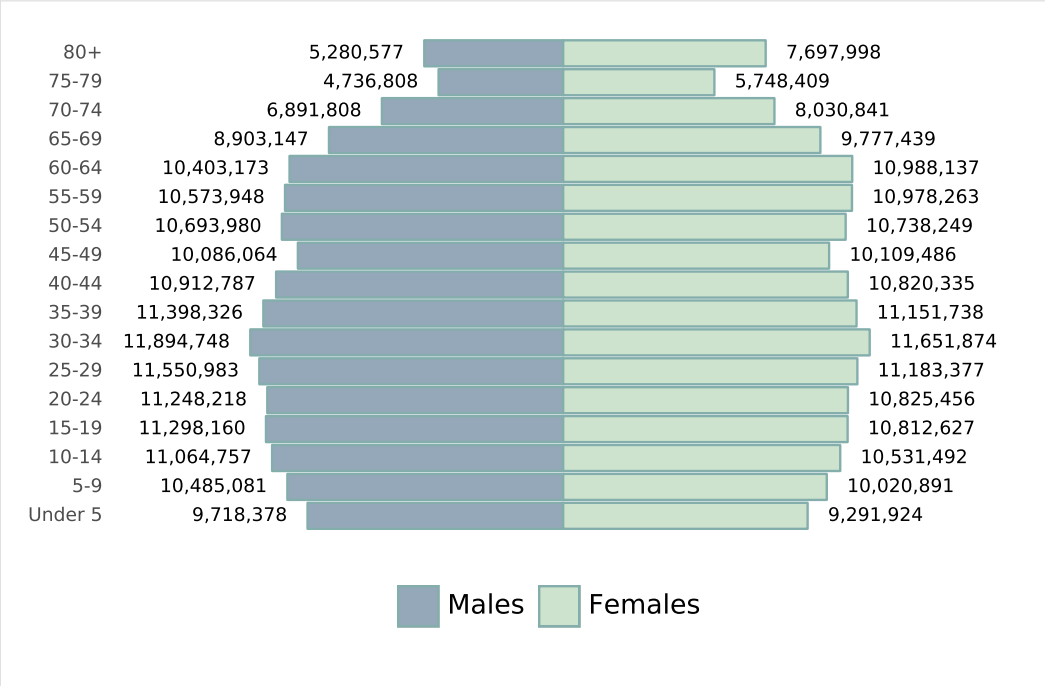
Section 6, Sexual and reproductive health behaviour indicators. This section presents sexual and reproductive behaviour indicators that may be used as proxy measures of risk for HPV infection and anogenital cancers, such as age at first sexual intercourse, average number of sexual partners, and anal intercourse among others.

Section 7, HPV preventive strategies. This section presents preventive strategies that include basic characteristics and performance of cervical cancer screening status, status of HPV vaccine licensure introduction, and recommendations in national immunisation programmes.

Section 8, Protective factors for cervical cancer. This section presents male circumcision and the use of condoms.

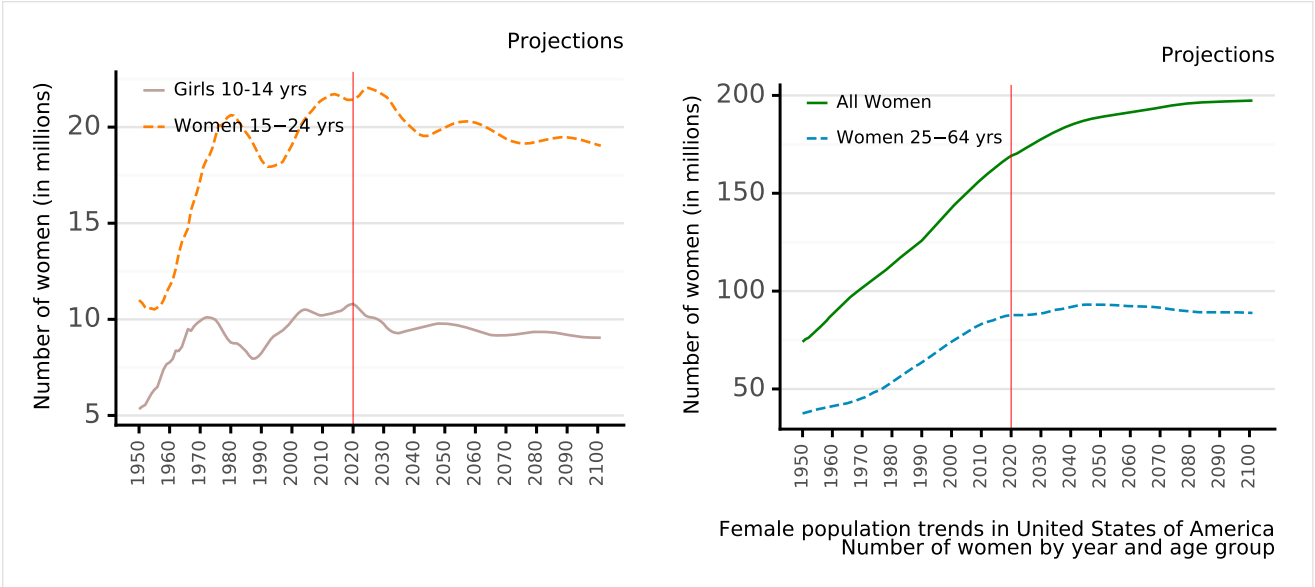
2 Demographic and socioeconomic factors

Figure 2: Population pyramid of United States of America for 2022



Data accessed on 30 Jul 2022
For statistical purposes, the data for United States of America do not include American Samoa, Guam, Northern Mariana Islands, Puerto Rico, and United States Virgin Islands.
Please refer to original source for methods of estimation.
Year of estimate: 2022
Data Sources:
United Nations, Department of Economic and Social Affairs, Population Division (2022). World Population Prospects 2022, Online Edition. [Accessed on July 30, 2022].

Figure 3: Population trends in four selected age groups in United States of America



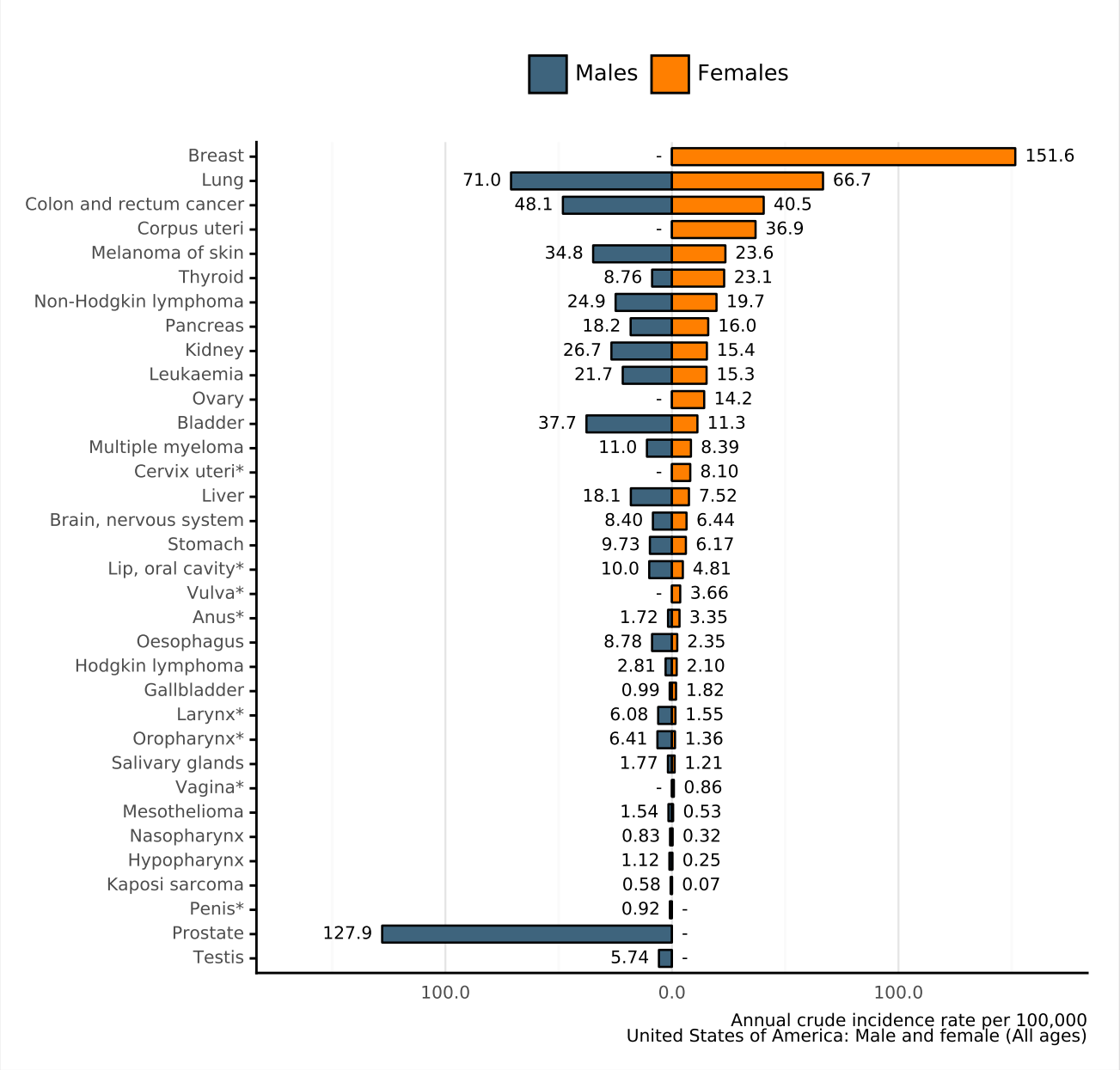
Data accessed on 30 Jul 2022
For statistical purposes, the data for United States of America do not include American Samoa, Guam, Northern Mariana Islands, Puerto Rico, and United States Virgin Islands.
Please refer to original source for methods of estimation.
Year of estimate: 2022
Data Sources:
United Nations, Department of Economic and Social Affairs, Population Division (2022). World Population Prospects 2022, Online Edition. [Accessed on July 30, 2022].

3 Burden of HPV related cancers

HPV is the cause of almost all cervical cancer cases and is responsible for an important fraction of other anogenital and head and neck cancer. Here, we present the most recent estimations on the burden of HPV-associated cancer.

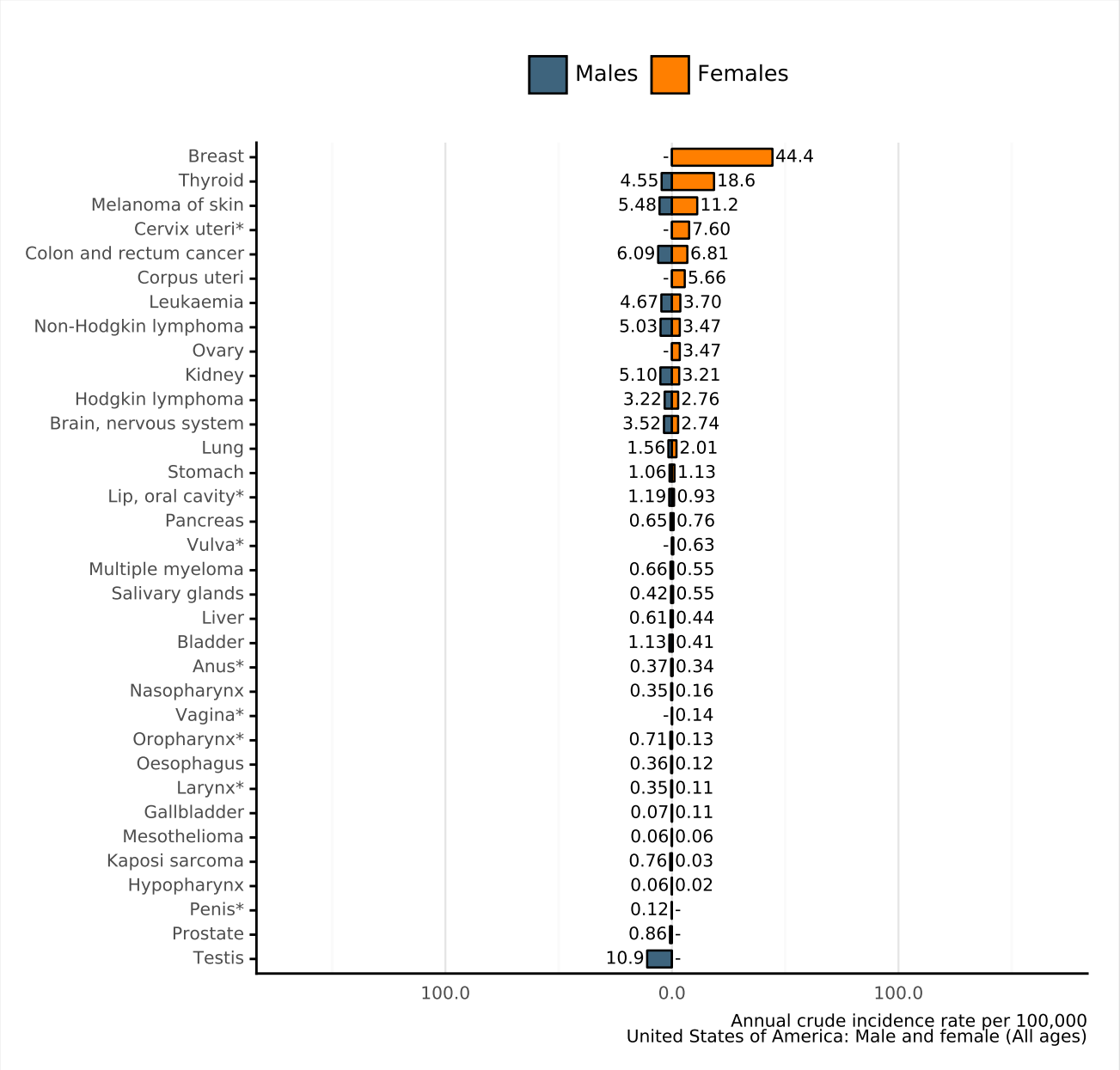
3.1 HPV related cancers incidence

Figure 4: Comparison of HPV related cancers incidence to other cancers in men and women of all ages in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
Non-melanoma skin cancer is not included
Rates per 100,000 men per year.
Rates per 100,000 women per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 5: Comparison of HPV related cancers incidence to other cancers among men and women 15-44 years of age in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021

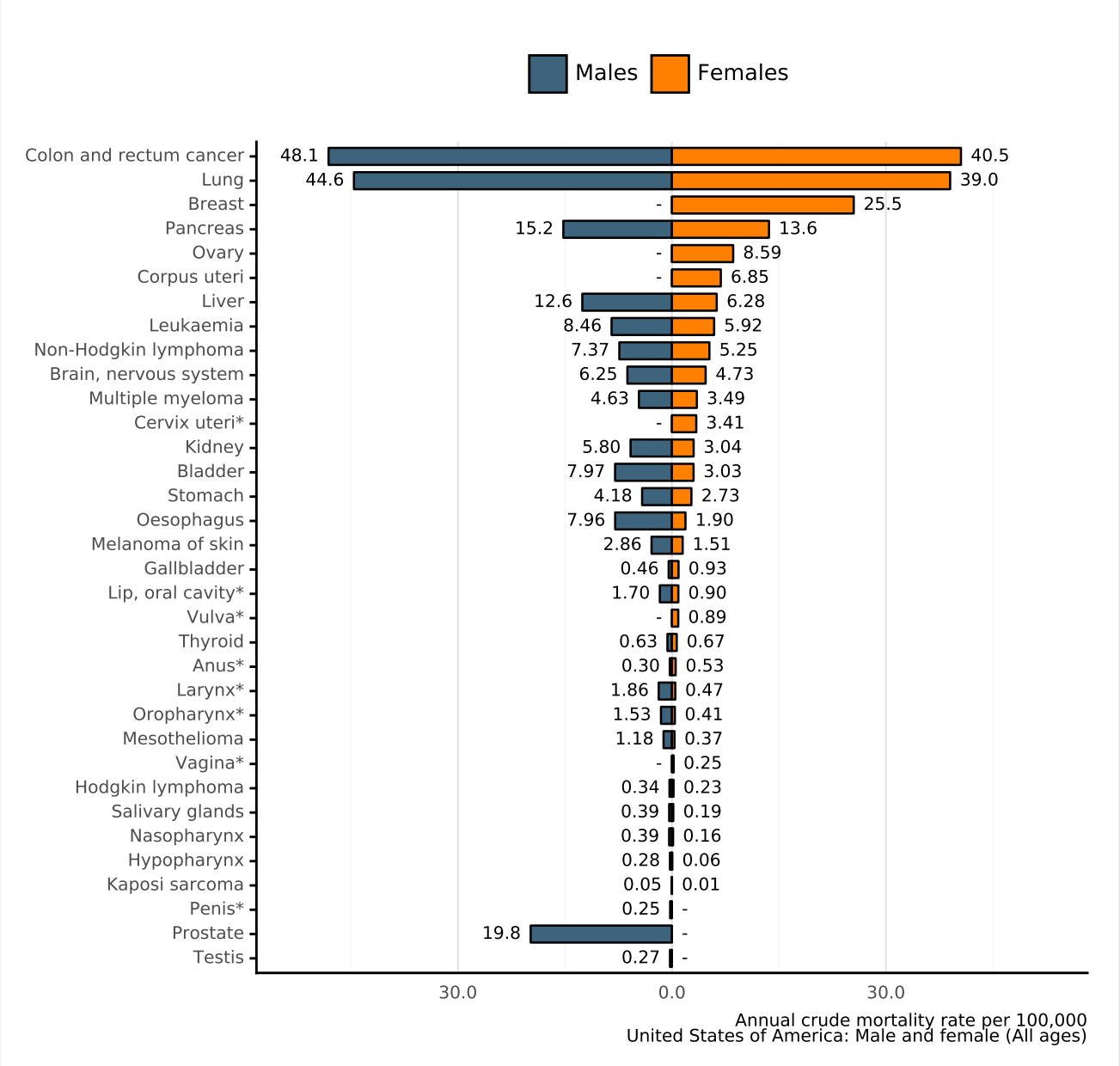
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
Non-melanoma skin cancer is not included
Rates per 100,000 men per year.
Rates per 100,000 women per year.

Data Sources:

Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

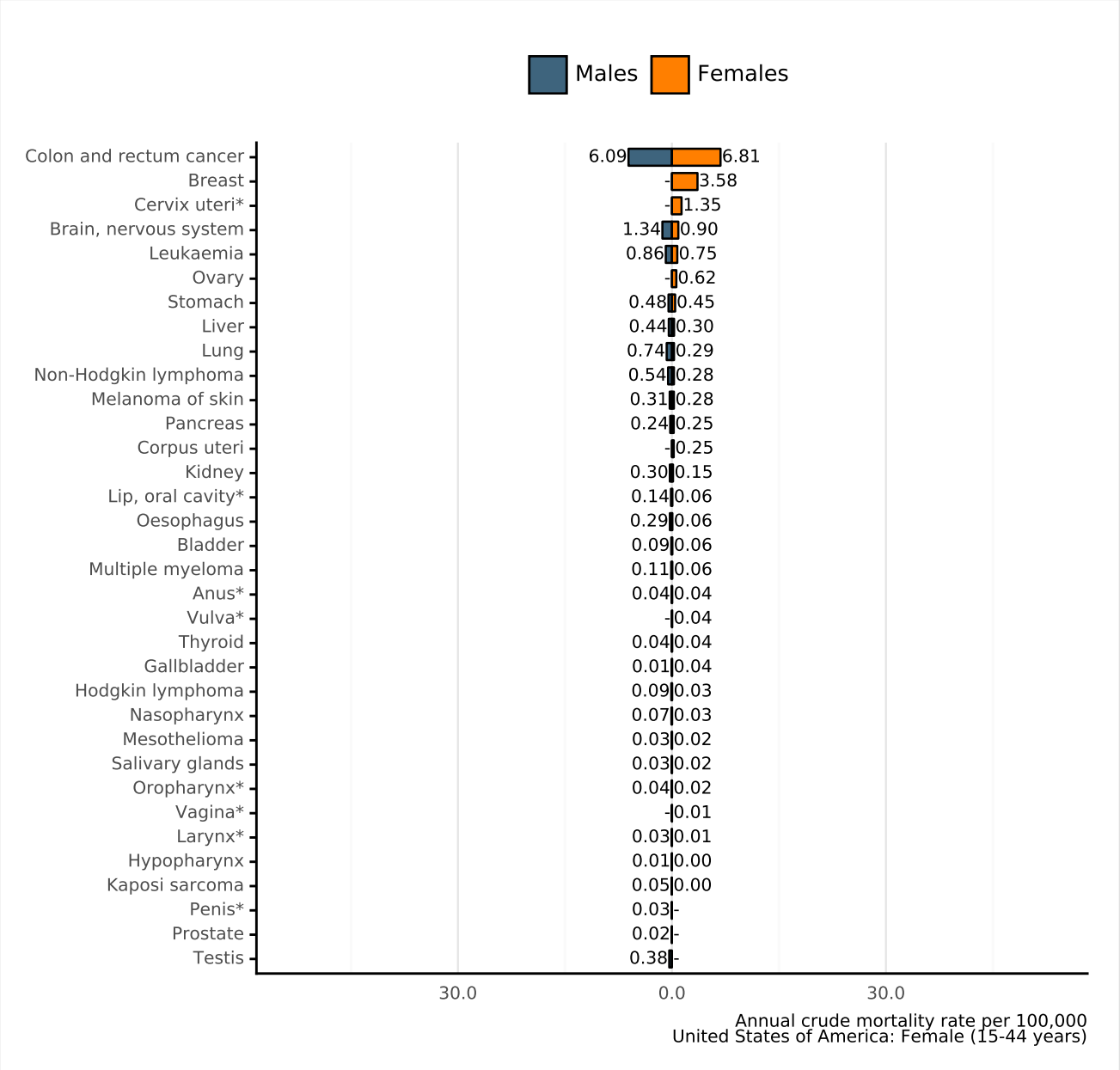
3.2 HPV related cancers mortality

Figure 6: Comparison of HPV related cancers mortality to other cancers in men and women of all ages in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
Non-melanoma skin cancer is not included
Rates per 100,000 men per year.
Rates per 100,000 women per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today , accessed [27 January 2021].

Figure 7: Comparison of HPV related cancers mortality to other cancers among men and women 15-44 years of age in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021

For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
Non-melanoma skin cancer is not included
Rates per 100,000 men per year.
Rates per 100,000 women per year.

Data Sources:

Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

3.3 Cervical cancer

Cancer of the cervix uteri is the 4^{th} most common cancer among women worldwide, with an estimated 604,127 new cases and 341,831 deaths in 2020. Worldwide, mortality rates of cervical cancer are substantially lower than incidence with a ratio of mortality to incidence to 57% (GLOBOCAN 2020). The majority of cases are squamous cell carcinoma followed by adenocarcinomas. *(Vaccine 2006, Vol. 24, Suppl 3; Vaccine 2008, Vol. 26, Suppl 10; Vaccine 2012, Vol. 30, Suppl 5; IARC Monographs 2007, Vol. 90)*

This section describes the current burden of invasive cervical cancer in United States of America and in comparison to geographic region, including estimates of the annual number of new cases, deaths, incidence, and mortality rates.

3.3.1 Cervical cancer incidence in United States of America

Key Stats.

About **13,545 new cervical cancer cases** are diagnosed **annually** in **United States of America** (estimations for 2020).

Cervical cancer **ranks* as the 14th leading cause** of female cancer in **United States of America**.

Cervical cancer is the **4th most common** female cancer in **women aged 15 to 44 years in United States of America**.

* Ranking of cervical cancer incidence to other cancers among all women according to highest incidence rates (ranking 1st) excluding non-melanoma skin cancer. Ranking is based on crude incidence rates (actual number of cervical cancer cases). Ranking using age-standardized rate (ASR) may differ.

Table 2: Cervical cancer incidence in United States of America (estimates for 2020)

Indicator	United States of America	Northern America	World
Annual number of new cancer cases	13,545	14,971	604,127
Uncertainty intervals of new cancer cases [95% UI]	[13,119-13,985]	[14,703-15,244]	[582,031-627,062]
Crude incidence rate[b]	8.10	8.04	15.6
Age-standardized incidence rate[b]	6.23	6.15	13.3
Cumulative risk (%) at 75 years old[a]	0.60	0.59	1.39

Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Cumulative risk (incidence) is the probability or risk of individuals getting from the disease during ages 0-74 years. For cancer, it is expressed as the % of new born children who would be expected to develop from a particular cancer before the age of 75 if they had the rates of cancer observed in the period in the absence of competing causes.
[b] Rates per 100,000 women per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Table 3: Cervical cancer incidence in United States of America by cancer registry

Cancer registry	Period	N cases[a]	Crude rate[b]	ASR[b]
Puerto Rico[1]	2003-2007	1013	10	7.7
Alabama[1]	2003-2007	1035	8.8	6.7
Alabama[1]	2003-2007	304	9.4	7.3
Alabama[1]	2003-2007	705	8.4	6.5
Alaska[1]	2003-2007	123	7.7	6.4
Alaska[1]	2003-2007	30	10.8	10.6
Arizona[1]	2003-2007	1056	7.1	5.8
Arizona[1]	2003-2007	58	7.3	7.3
Arizona[1]	2003-2007	25	5.9	4.5
Arizona[1]	2003-2007	20	3.3	3.3
Arizona[1]	2003-2007	927	7.1	5.7
California[1]	2003-2007	7362	8.2	6.5
California[1]	2003-2007	43	3.5	3.1
California[1]	2003-2007	972	8	5.9
California[1]	2003-2007	440	6.7	5.7
California[1]	2003-2007	5771	8.3	6.7
California: Alameda County[2]	1983-1987	62	10.5	9.4
California: Alameda County[2]	1983-1987	177	8.4	6.5
California: San Francisco[1]	2003-2007	653	6.2	4.5
California: San Francisco[1]	2003-2007	150	5.9	4.1
California: San Francisco[1]	2003-2007	69	6.4	4.9
California: San Francisco[1]	2003-2007	150	8.5	8.2
California: San Francisco[1]	2003-2007	272	5.4	3.7
California: San Francisco[1]	2003-2007	422	6.2	4.6
California: Los Angeles[3]	1993-1997	332	12.4	10.4
California: Los Angeles[3]	1993-1997	55	6.8	5.6
California: Los Angeles[3]	1993-1997	89	11.9	10
California: Los Angeles[3]	1993-1997	1199	15.5	19.5
California: Los Angeles[3]	1993-1997	29	8.2	5.1
California: Los Angeles[3]	1993-1997	83	17.1	14.5
California: Los Angeles[3]	1993-1997	920	10	7.3
California: Los Angeles County[4]	1998-2002	2769	11.5	9.5
California: Los Angeles County[4]	1998-2002	262	9.7	7.8
California: Los Angeles County[4]	1998-2002	64	7	4.9
California: Los Angeles County[4]	1998-2002	91	12.1	8.8
California: Los Angeles County[4]	1998-2002	1404	14	15.1
California: Los Angeles County[4]	1998-2002	23	6.9	4.6
California: Los Angeles County[4]	1998-2002	69	13.7	9.8
California: Los Angeles County[4]	1998-2002	740	9.5	6.6
California, Los Angeles County[1]	2003-2007	2488	10.1	8
California, Los Angeles County[1]	2003-2007	363	10.3	7.2
California, Los Angeles County[1]	2003-2007	209	8	6.1
California, Los Angeles County[1]	2003-2007	74	7.2	5
California, Los Angeles County[1]	2003-2007	89	10.9	7.4
California, Los Angeles County[1]	2003-2007	1220	11.3	11.6
California, Los Angeles County[1]	2003-2007	42	12.7	8.9

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Table 3 – continued from previous page

Cancer registry	Period	N cases[a]	Crude rate[b]	ASR[b]
California, Los Angeles County[1]	2003-2007	65	11.8	7.9
California, Los Angeles County[1]	2003-2007	664	8.9	6
California, Los Angeles County[1]	2003-2007	1884	10.3	8.5
Central California[5]	1988-1992	232	13.6	17.1
Central California[5]	1988-1992	356	10	7.8
Central Louisiana[3]	1993-1997	39	18.7	16.9
Central Louisiana[3]	1993-1997	52	9.6	7.9
Colorado[1]	2003-2007	810	7	5.5
Colorado[1]	2003-2007	24	6.6	5.6
Colorado[1]	2003-2007	36	6.9	6.5
Colorado[1]	2003-2007	721	6.8	5.3
Connecticut[1]	2003-2007	637	7.1	5.3
Connecticut[1]	2003-2007	81	8.4	7.1
Connecticut[1]	2003-2007	532	7	5.2
District of Columbia[4]	1998-2002	194	12.9	9.8
District of Columbia[4]	1998-2002	151	15.7	12
District of Columbia[4]	1998-2002	23	4.7	3.8
Florida[1]	2003-2007	4441	9.9	7.4
Florida[1]	2003-2007	56	4.9	3.8
Florida[1]	2003-2007	760	10.4	9.1
Florida[1]	2003-2007	3549	9.7	7.2
Georgia[1]	2003-2007	1941	8.4	6.6
Georgia[1]	2003-2007	39	5.9	5
Georgia[1]	2003-2007	654	9.1	7.8
Georgia[1]	2003-2007	1229	8.1	6.3
Georgia: Atlanta[4]	1998-2002	647	8.8	7
Georgia: Atlanta[4]	1998-2002	247	8.8	8.7
Georgia: Atlanta[4]	1998-2002	353	8.4	6.1
Georgia, Atlanta[1]	2003-2007	621	7.4	5.9
Georgia, Atlanta[1]	2003-2007	259	7.8	6.9
Georgia, Atlanta[1]	2003-2007	327	7.2	5.5
Hawaii[1]	2003-2007	249	8	6
Hawaii[1]	2003-2007	12	6.9	4.9
Hawaii[1]	2003-2007	45	9.4	7
Hawaii[1]	2003-2007	44	6.2	6.4
Hawaii[1]	2003-2007	45	7	4
Hawaii[1]	2003-2007	57	7.9	5.3
Idaho[1]	2003-2007	223	6.3	5.2
Illinois[1]	2003-2007	2912	9	6.9
Illinois[1]	2003-2007	54	3.9	3.2
Illinois[1]	2003-2007	648	12.5	10.3
Illinois[1]	2003-2007	2130	8.3	6.3
Indiana[1]	2003-2007	1312	8.3	6.4
Indiana[1]	2003-2007	130	8.7	7.7
Indiana[1]	2003-2007	1144	8.1	6.2
Iowa[1]	2003-2007	524	7	5.6
Kentucky[1]	2003-2007	1025	9.6	7.3

Continued on next page

Table 3 – continued from previous page

Cancer registry	Period	N cases[a]	Crude rate[b]	ASR[b]
Louisiana[1]	2003-2004,2006-2007	841	9.3	7.4
Louisiana[1]	2003-2004,2006-2007	359	11.9	10.2
Louisiana[1]	2003-2004,2006-2007	473	8.1	6.4
Louisiana, New Orleans[1]	2003-2004,2006-2007	161	9.1	7
Louisiana, New Orleans[1]	2003-2004,2006-2007	82	10.7	8.8
Louisiana, New Orleans[1]	2003-2004,2006-2007	75	8	6.1
Louisiana: New Orleans[4]	1998-2002	151	12.7	11.4
Louisiana: New Orleans[4]	1998-2002	126	9.2	6.7
Maine[1]	2003-2007	269	8	6
Massachusetts[1]	2003-2007	1058	6.3	4.7
Massachusetts[1]	2003-2007	37	4.6	4.2
Massachusetts[1]	2003-2007	90	7.5	6.5
Massachusetts[1]	2003-2007	911	6.2	4.6
Michigan[1]	2003-2007	1961	7.7	6.1
Michigan[1]	2003-2007	23	3.8	3.7
Michigan[1]	2003-2007	392	10	8.7
Michigan[1]	2003-2007	1494	7.1	5.6
Michigan: Detroit[4]	1998-2002	1013	9.7	7.4
Michigan: Detroit[4]	1998-2002	337	12.1	10
Michigan: Detroit[4]	1998-2002	645	8.8	6.7
Michigan, Detroit[1]	2003-2007	874	8.4	6.6
Michigan, Detroit[1]	2003-2007	313	11.2	9.5
Michigan, Detroit[1]	2003-2007	543	7.5	5.7
Missouri[1]	2003-2007	1269	8.5	6.6
Missouri[1]	2003-2007	208	11.4	9.9
Missouri[1]	2003-2007	1029	8.1	6.2
Montana[1]	2003-2007	140	6	4.5
Montana[1]	2003-2007	11	6.9	7.8
Nevada[6]	1959-1966	419	29.5	28.2
New Jersey[1]	2003-2007	2202	10	7.4
New Jersey[1]	2003-2007	423	12.6	10.1
New Jersey[1]	2003-2007	1642	9.7	7.1
New Mexico[1]	2003-2007	394	8.1	6.4
New Mexico[1]	2003-2007	176	8.8	7.8
New Mexico[1]	2003-2007	172	8.1	5.8
New Mexico[1]	2003-2007	348	8.4	6.6
New York City[2]	1983-1987	2629	13.6	10.4
New York State[1]	2003-2007	4605	9.2	6.7
New York State[1]	2003-2007	246	7.3	5.7
New York State[1]	2003-2007	1140	12.3	9.6
New York State[1]	2003-2007	3048	8.3	6

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Table 3 – continued from previous page

Cancer registry	Period	N cases[a]	Crude rate[b]	ASR[b]
New York State (Less City)[2]	1983-1987	2685	9.9	7.7
NPCR[4]	1998-2002	55469	9.7	7.6
NPCR[4]	1998-2002	8693	11.8	10.2
NPCR[4]	1998-2002	43436	9.3	7.2
NPCR (42 States)[1]	2003-2007	55899	8.3	6.4
NPCR (42 States)[1]	2003-2007	433	6	5.5
NPCR (42 States)[1]	2003-2007	2068	6.7	5.3
NPCR (42 States)[1]	2003-2007	8798	9.6	8
NPCR (42 States)[1]	2003-2007	43408	8	6.2
Ohio[1]	2003-2007	2453	8.3	6.4
Ohio[1]	2003-2007	19	4.1	3.5
Ohio[1]	2003-2007	311	8.4	7
Ohio[1]	2003-2007	2080	8.3	6.3
Oklahoma[1]	2003-2007	844	9.4	7.5
Oklahoma[1]	2003-2007	95	11.6	10.5
Oklahoma[1]	2003-2007	47	6.3	5.9
Oklahoma[1]	2003-2007	682	9.4	7.3
Oregon[1]	2003-2007	608	6.6	5.2
Oregon[1]	2003-2007	28	7.2	6.2
Oregon[1]	2003-2007	16	8.2	7.8
Oregon[1]	2003-2007	540	6.4	5
Pennsylvania[1]	2003-2007	2683	8.4	6.3
Pennsylvania[1]	2003-2007	49	6.6	5.8
Pennsylvania[1]	2003-2007	322	9	7.6
Pennsylvania[1]	2003-2007	2239	8.1	6
Rhode Island[1]	2003-2007	231	8.4	6.4
Rhode Island[1]	2003-2007	18	10	9.5
Rhode Island[1]	2003-2007	193	7.8	5.9
SEER[3]	1993-1997	853	11.5	10.2
SEER[3]	1993-1997	4372	8.7	6.8
SEER (14 Registries)[4]	1998-2002	17731	9.4	7.4
SEER (14 Registries)[4]	1998-2002	1395	8.3	6.6
SEER (14 Registries)[4]	1998-2002	2360	10.8	9.4
SEER (14 Registries)[4]	1998-2002	3732	11.4	12.3
SEER (14 Registries)[4]	1998-2002	9923	8.7	6.4
SEER (9 Registries)[1]	2003-2007	5009	7.1	5.5
SEER (9 Registries)[1]	2003-2007	763	8.3	7.1
SEER (9 Registries)[1]	2003-2007	3640	6.9	5.3
South Carolina[1]	2003-2007	931	8.5	6.5
South Carolina[1]	2003-2007	334	10.1	8.1
South Carolina[1]	2003-2007	559	7.5	5.8
Texas[1]	2003-2007	5401	9.4	7.7
Texas[1]	2003-2007	79	3.9	3.4
Texas[1]	2003-2007	690	9.7	8.3
Texas[1]	2003-2007	4524	9.5	7.8
Texas: El Paso County[7]	1968-1970	169	67.4	80.9
Texas: El Paso County[7]	1968-1970	137	47.2	46.6

Continued on next page

Table 3 – continued from previous page

Cancer registry	Period	N cases[a]	Crude rate[b]	ASR[b]
Utah[1]	2003-2007	292	4.7	4.3
Vermont[1]	2003-2007	98	6.2	4.6
Washington: Seattle[4]	1998-2002	734	7.2	5.5
Washington, Seattle[1]	2003-2007	765	7.1	5.5
Washington State[1]	2003-2007	1096	7	5.5
West Virginia[1]	2003-2007	469	10.2	7.7
Wisconsin[1]	2003-2007	905	6.5	5.1
Wisconsin[1]	2003-2007	89	9.9	10
Wisconsin[1]	2003-2007	761	6	4.6
Arkansas[1]	2003-2007	704	9.9	7.6
Arkansas[1]	2003-2007	125	10.7	8.8
Arkansas[1]	2003-2007	565	9.8	7.5
Delaware[1]	2003-2007	185	8.6	6.5
Delaware[1]	2003-2007	51	11	9.2
Delaware[1]	2003-2007	128	7.9	5.9
Mississippi[1]	2003-2007	709	9.5	7.3
Nebraska[1]	2003-2007	313	7.1	5.7
Nebraska[1]	2003-2007	10	4.8	4.4
Nebraska[1]	2003-2007	291	7.1	5.7
New Hampshire[1]	2003-2007	220	6.7	5
North Carolina[1]	2003-2007	1842	8.3	6.2
North Carolina[1]	2003-2007	15	5.2	4.4
North Carolina[1]	2003-2007	30	6.8	6.5
North Carolina[1]	2003-2007	464	9.1	7.1
North Carolina[1]	2003-2007	1293	7.9	6
North Dakota[1]	2003-2007	82	5.2	4.2
SEER (18 Registries)[1]	2003-2007	17130	8.2	6.4
SEER (18 Registries)[1]	2003-2007	1464	7.6	5.7
SEER (18 Registries)[1]	2003-2007	2409	9.3	7.9
SEER (18 Registries)[1]	2003-2007	3734	9.8	10
SEER (18 Registries)[1]	2003-2007	9184	7.5	5.6
SEER (18 Registries)[1]	2003-2007	12918	8.1	6.3
South Dakota[1]	2003-2007	115	5.9	4.8
Tennessee[1]	2003-2007	1348	8.8	6.6
Tennessee[1]	2003-2007	272	10	8.5
Tennessee[1]	2003-2007	1037	8.3	6.2
Virginia[1]	2003-2007	1348	7	5.2
Virginia[1]	2003-2007	62	6.4	5.2
Virginia[1]	2003-2007	276	6.9	5.5
Virginia[1]	2003-2007	968	6.8	5.1
Wyoming[1]	2003-2007	106	8.4	7
Puerto Rico[8]	2008-2012	1203	12.1	9.3
National[8]	2008-2012	61857	7.9	6
National[8]	2008-2012	47835	7.7	5.9
National[8]	2008-2012	10020	9.1	7.4
NPCR[8]	2008-2012	59269	7.9	6.1

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Table 3 – continued from previous page

Cancer registry	Period	N cases[a]	Crude rate[b]	ASR[b]
NPCR[8]	2008-2012	45700	7.8	6
NPCR[8]	2008-2012	9903	9.2	7.5
NPCR[8]	2008-2012	2551	6.2	4.7
NPCR[8]	2008-2012	465	4.8	4.4
SEER (18 registries)[8]	2008-2012	17051	7.8	6
SEER (18 registries)[8]	2008-2012	12774	7.8	6.1
SEER (18 registries)[8]	2008-2012	9153	7.6	5.7
SEER (18 registries)[8]	2008-2012	3621	8.4	8.1
SEER (18 registries)[8]	2008-2012	2414	8.5	6.9
SEER (18 registries)[8]	2008-2012	1494	6.5	4.7
SEER (9 registries)[8]	2008-2012	5081	6.9	5.3
SEER (9 registries)[8]	2008-2012	3662	6.8	5.3
SEER (9 registries)[8]	2008-2012	735	7.5	6.1
Alabama[8]	2008-2012	1061	8.6	6.7
Alabama[8]	2008-2012	714	8.3	6.5
Alabama[8]	2008-2012	332	9.7	7.7
Alaska[8]	2008-2012	123	7.2	6
Alaska[8]	2008-2012	28	9.4	9.3
Arizona[8]	2008-2012	1079	6.7	5.4
Arizona[8]	2008-2012	943	6.8	5.4
Arizona[8]	2008-2012	48	6.3	6.2
Arizona[8]	2008-2012	51	5.6	5.4
Arkansas[8]	2008-2012	712	9.6	7.6
Arkansas[8]	2008-2012	560	9.3	7.4
Arkansas[8]	2008-2012	135	11	9.2
California[8]	2008-2012	7265	7.7	6
California[8]	2008-2012	5609	7.9	6.3
California[8]	2008-2012	494	7.2	5.8
California[8]	2008-2012	53	3	2.7
California, Los Angeles County[8]	2008-2012	2216	8.9	6.8
California, Los Angeles County[8]	2008-2012	1627	9	7.2
California, Los Angeles County[8]	2008-2012	571	8.1	5.7
California, Los Angeles County[8]	2008-2012	1056	9.7	8.7
California, Los Angeles County[8]	2008-2012	217	8.5	6.2
California, Los Angeles County[8]	2008-2012	83	7.5	4.9
California, Los Angeles County[8]	2008-2012	94	9.9	6.5
California, Los Angeles County[8]	2008-2012	52	8.7	5.5
California, San Francisco Bay Area[8]	2008-2012	738	6.7	4.8
California, San Francisco Bay Area[8]	2008-2012	472	6.9	5.1
California, San Francisco Bay Area[8]	2008-2012	309	6.4	4.5
California, San Francisco Bay Area[8]	2008-2012	163	8.2	7.1
California, San Francisco Bay Area[8]	2008-2012	69	6.4	4.8
California, San Francisco Bay Area[8]	2008-2012	54	4.5	2.8
California, San Francisco Bay Area[8]	2008-2012	54	7.5	5
California, San Francisco Bay Area[8]	2008-2012	12	8	4.5
Colorado[8]	2008-2012	758	6	4.7
Colorado[8]	2008-2012	687	6.1	4.7

Continued on next page

Table 3 – continued from previous page

Cancer registry	Period	N cases[a]	Crude rate[b]	ASR[b]
Colorado[8]	2008-2012	29	4.9	4.6
Connecticut[8]	2008-2012	600	6.5	4.8
Connecticut[8]	2008-2012	496	6.5	4.8
Connecticut[8]	2008-2012	68	6.3	5
Delaware[8]	2008-2012	213	9.2	6.9
Delaware[8]	2008-2012	166	9.9	7.5
Delaware[8]	2008-2012	45	8.3	6.5
Florida[8]	2008-2012	4561	9.5	6.9
Florida[8]	2008-2012	3573	9.3	6.8
Florida[8]	2008-2012	883	10.7	8.9
Georgia[8]	2008-2012	2009	8.1	6.2
Georgia[8]	2008-2012	1286	8.2	6.4
Georgia[8]	2008-2012	666	8.2	6.7
Georgia, Atlanta[8]	2008-2012	614	7.1	5.5
Georgia, Atlanta[8]	2008-2012	311	7.1	5.4
Georgia, Atlanta[8]	2008-2012	271	7.3	6.1
Idaho[8]	2008-2012	234	6	4.9
Illinois[8]	2008-2012	2737	8.4	6.3
Illinois[8]	2008-2012	1985	7.8	5.8
Illinois[8]	2008-2012	630	12.1	9.8
Indiana[8]	2008-2012	1262	7.7	6
Indiana[8]	2008-2012	1100	7.6	5.9
Indiana[8]	2008-2012	130	7.8	6.8
Iowa[8]	2008-2012	530	6.9	5.6
Kentucky[8]	2008-2012	994	9	6.9
Louisiana[8]	2008-2012	1077	9.3	7.3
Louisiana[8]	2008-2012	635	8.6	6.8
Louisiana[8]	2008-2012	424	10.9	8.9
Louisiana, New Orleans[8]	2008-2012	199	9.5	7.3
Louisiana, New Orleans[8]	2008-2012	91	8.2	6.4
Louisiana, New Orleans[8]	2008-2012	100	11.2	8.9
Maine[8]	2008-2012	223	6.6	4.9
Maryland[8]	2008-2012	1047	7	5.2
Maryland[8]	2008-2012	585	6.4	4.7
Maryland[8]	2008-2012	382	8	6.1
Massachusetts[8]	2008-2012	963	5.7	4.2
Massachusetts[8]	2008-2012	802	5.6	4.1
Massachusetts[8]	2008-2012	97	6.9	5.9
Michigan[8]	2008-2012	1768	7	5.5
Michigan[8]	2008-2012	1380	6.8	5.3
Michigan[8]	2008-2012	322	8.3	6.7
Michigan, Detroit[8]	2008-2012	792	7.9	5.9
Michigan, Detroit[8]	2008-2012	502	7.3	5.4
Michigan, Detroit[8]	2008-2012	267	9.8	7.7
Minnesota[8]	2008-2012	808	6	4.8
Mississippi[8]	2008-2012	747	9.8	7.6

Continued on next page

Table 3 – continued from previous page

Cancer registry	Period	N cases[a]	Crude rate[b]	ASR[b]
Missouri[8]	2008-2012	1290	8.5	6.6
Missouri[8]	2008-2012	1084	8.4	6.6
Missouri[8]	2008-2012	182	9.5	7.8
Montana[8]	2008-2012	173	7	5.2
Nebraska[8]	2008-2012	303	6.6	5.6
Nebraska[8]	2008-2012	277	6.6	5.5
Nebraska[8]	2008-2012	14	5.9	5.9
Nevada[8]	2008-2012	514	7.7	5.9
Nevada[8]	2008-2012	417	7.9	6
Nevada[8]	2008-2012	44	6.9	6.1
New Hampshire[8]	2008-2012	180	5.4	4.1
New Jersey[8]	2008-2012	1950	8.6	6.2
New Jersey[8]	2008-2012	1453	8.6	6.2
New Jersey[8]	2008-2012	372	10.6	8
New Mexico[8]	2008-2012	392	7.5	6.1
New Mexico[8]	2008-2012	343	7.8	6.2
New Mexico[8]	2008-2012	170	7.6	6.7
New Mexico[8]	2008-2012	173	8	5.6
New York State[8]	2008-2012	4255	8.5	6.1
New York State[8]	2008-2012	2830	7.9	5.7
New York State[8]	2008-2012	1030	10.9	8.1
North Carolina[8]	2008-2012	1769	7.2	5.5
North Carolina[8]	2008-2012	1239	7	5.3
North Carolina[8]	2008-2012	477	8.3	6.5
North Dakota[8]	2008-2012	107	6.4	5.3
Ohio[8]	2008-2012	2261	7.7	5.9
Ohio[8]	2008-2012	1919	7.7	5.9
Ohio[8]	2008-2012	283	7.2	6
Oklahoma[8]	2008-2012	877	9.3	7.5
Oklahoma[8]	2008-2012	703	9.4	7.5
Oklahoma[8]	2008-2012	62	7.7	7
Oregon[8]	2008-2012	666	6.9	5.3
Oregon[8]	2008-2012	594	6.8	5.2
Oregon[8]	2008-2012	12	5.4	5.4
Pennsylvania[8]	2008-2012	2642	8.1	6.1
Pennsylvania[8]	2008-2012	2132	7.7	5.8
Pennsylvania[8]	2008-2012	397	10.1	8.3
Rhode Island[8]	2008-2012	177	6.5	5
Rhode Island[8]	2008-2012	161	6.7	5.1
Rhode Island[8]	2008-2012	6	2.8	3.3
South Carolina[8]	2008-2012	970	8.2	6.2
South Carolina[8]	2008-2012	638	7.9	6.1
South Carolina[8]	2008-2012	313	8.9	6.9
South Dakota[8]	2008-2012	131	6.4	5.4
Tennessee[8]	2008-2012	1448	8.9	6.8
Tennessee[8]	2008-2012	1126	8.6	6.5
Tennessee[8]	2008-2012	289	9.9	8.3

Continued on next page

Table 3 – continued from previous page

Cancer registry	Period	N cases[a]	Crude rate[b]	ASR[b]
Texas[8]	2008-2012	5693	9	7.3
Texas[8]	2008-2012	4713	9.1	7.5
Texas[8]	2008-2012	811	9.9	8.4
Utah[8]	2008-2012	312	4.5	4.2
Vermont[8]	2008-2012	77	4.9	3.4
Virginia[8]	2008-2012	1318	6.5	4.9
Virginia[8]	2008-2012	911	6.2	4.7
Virginia[8]	2008-2012	313	7.3	5.7
Washington State[8]	2008-2012	1184	7	5.5
Washington, Seattle[8]	2008-2012	838	7.3	5.5
West Virginia[8]	2008-2012	504	10.7	8
Wisconsin[8]	2008-2012	883	6.2	4.8
Wisconsin[8]	2008-2012	743	5.8	4.4
Wisconsin[8]	2008-2012	88	8.8	8.8
Wyoming[8]	2008-2012	115	8.3	6.8
Hawaii[8]	2008-2012	265	7.8	6.1
Hawaii[8]	2008-2012	64	8.2	6.2
Hawaii[8]	2008-2012	42	7.1	4.5
Hawaii[8]	2008-2012	10	4.1	2.9
Hawaii[8]	2008-2012	43	6	5.7
Hawaii[8]	2008-2012	54	9	6.8
Pacific Islands[8]	2008-2012	136	18.9	17.3

Data accessed on 5 Oct 2018

Please refer to original source (available at http://ci5.iarc.fr/CI5-XI/Default.aspx)

ASR: Age-standardized rate, Standardized rates have been estimated using the direct method and the World population as the reference.

[a] Accumulated number of cases during the period in the population covered by the corresponding registry.

[b] Rates per 100,000 women per year.

Data Sources:

[1] Forman D, Bray F, Brewster DH, Gombe Mbalawa C, Kohler B, Piñeros M, Steliarova-Foucher E, Swaminathan R and Ferlay J eds (2013). Cancer Incidence in Five Continents, Vol. X (electronic version) Lyon, IARC. http://ci5.iarc.fr

[2] Parkin, D.M.,Muir, C.S.,Whelan, S.L.,Gao, Y.-T.,Ferlay, J.,Powell, J., eds (1992). Cancer Incidence in Five Continents, Vol. VI. IARC Scientific Publications No. 120, Lyon, IARC.

[3] Parkin, D.M., Whelan, S.L., Ferlay, J., Teppo, L., and Thomas, D.B., eds (2002). Cancer Incidence in Five Continents, Vol. VIII. IARC Scientific Publications No. 155, Lyon, IARC.

[4] Curado. M. P., Edwards, B., Shin. H.R., Storm. H., Ferlay. J., Heanue. M. and Boyle. P., eds (2007). Cancer Incidence in Five Continents, Vol. IX. IARC Scientific Publications No. 160, Lyon, IARC.

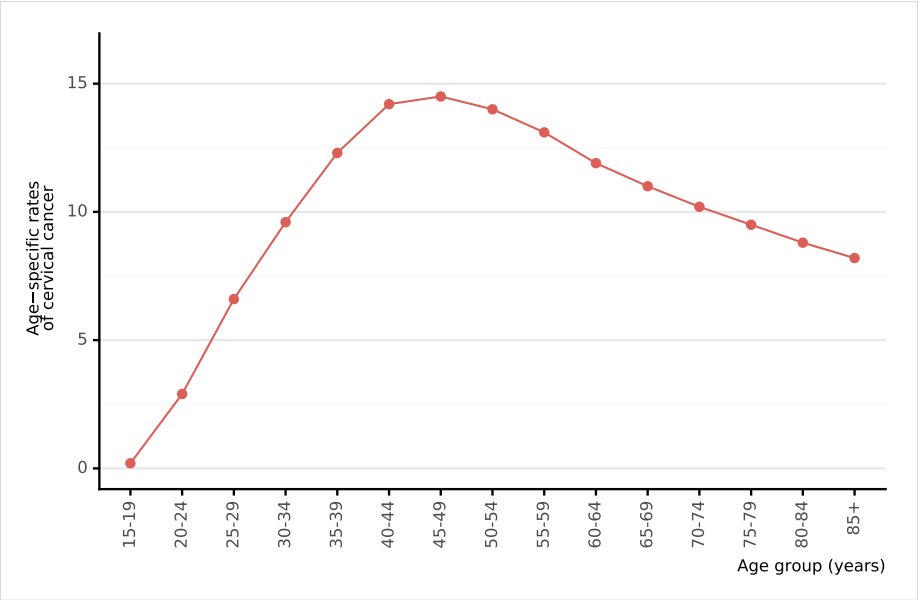
[5] Parkin, D.M., Whelan, S.L., Ferlay, J., Raymond, L., and Young, J., eds (1997). Cancer Incidence in Five Continents, Vol. VII. IARC Scientific Publications No. 143, Lyon, IARC.

[6] Doll, R.,Muir, C.S.,Waterhouse, J.A.H., eds (1970). Cancer Incidence in Five Continents, Vol. II. Union Internationale Contre le Cancer, Geneva.

[7] Waterhouse, J.,Muir, C.S.,Correa, P.,Powell, J., eds (1976). Cancer Incidence in Five Continents, Vol. III. IARC Scientific Publications No. 15, Lyon, IARC.

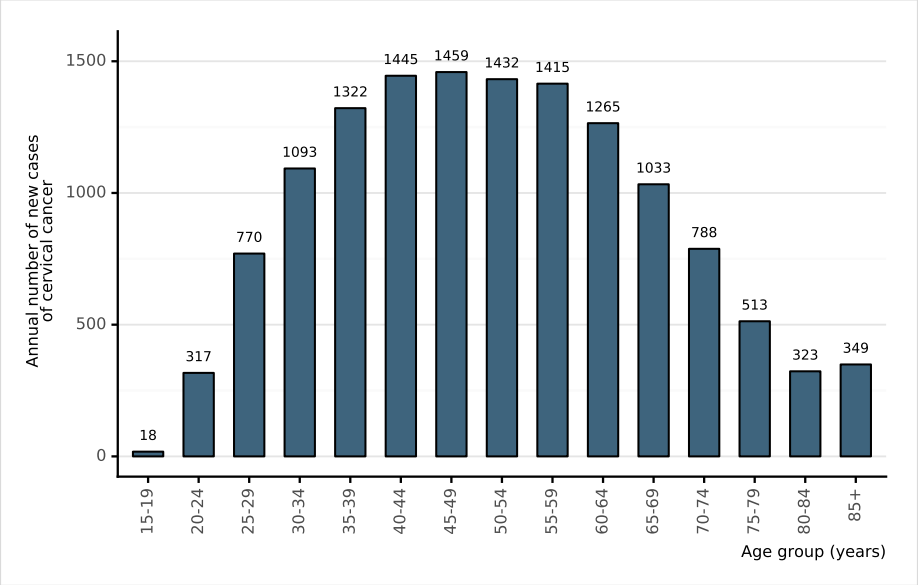
[8] Bray F, Colombet M, Mery L, Piñeros M, Znaor A, Zanetti R and Ferlay J, editors (2017). Cancer Incidence in Five Continents, Vol. XI (electronic version). Lyon: International Agency for Research on Cancer. Available from: http://ci5.iarc.fr, accessed [05 October 2018].

Figure 8: Age-specific incidence rates of cervical cancer in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Rates per 100,000 women per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 9: Annual number of new cases of cervical cancer in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

- For age-standardised incidence rates of cervical cancer of United States of America (estimates for 2020) please refer to Figure 73
- For annual number of new cases of cervical cancer by age group in United States of America (estimates for 2020) please refer to Figure 74
- For comparison of age-specific cervical cancer incidence rates in United States of America, within the region, and the rest of world please refer to Figure 75

3.3.2 Cervical cancer incidence by histology in United States of America

Table 4: Age-standardised incidence rates of cervical cancer in United States of America by histological type and cancer registry

Cancer registry[1]	Period	Squamo	Adeno	Other	Unspec.
Puerto Rico	2008-2012	6.8	1.6	0.2	0.4
National	2008-2012	3.9	1.4	0.3	0.2
National	2008-2012	3.7	1.4	0.3	0.2
National	2008-2012	5.5	0.9	0.4	0.2
NPCR	2008-2012	4	1.4	0.3	0.2
NPCR	2008-2012	3.8	1.5	0.3	0.2
NPCR	2008-2012	5.6	0.9	0.4	0.2
NPCR	2008-2012	3	1.1	0.3	0.1
NPCR	2008-2012	3.1	0.8	0.2	0.1
SEER (18 registries)	2008-2012	3.9	1.4	0.4	0.2
SEER (18 registries)	2008-2012	3.8	1.6	0.4	0.2
SEER (18 registries)	2008-2012	3.4	1.5	0.4	0.1
SEER (18 registries)	2008-2012	5.3	1.8	0.4	0.3
SEER (18 registries)	2008-2012	5.2	0.9	0.3	0.2
SEER (18 registries)	2008-2012	3	1.2	0.3	0.1
SEER (9 registries)	2008-2012	3.3	1.4	0.3	0.2
SEER (9 registries)	2008-2012	3.2	1.5	0.3	0.2
SEER (9 registries)	2008-2012	4.5	0.8	0.3	0.2
Alabama	2008-2012	4.6	1.3	0.3	0.2
Alabama	2008-2012	4.3	1.3	0.4	0.2
Alabama	2008-2012	5.7	1.3	0.2	0.2
Alaska	2008-2012	3.6	1.5	0.1	0.3
Alaska	2008-2012	5.1	2.3	0.3	1.6
Arizona	2008-2012	3.2	1.2	0.3	0.2
Arizona	2008-2012	3.2	1.2	0.3	0.2
Arizona	2008-2012	4.5	0.9	0.6	-
Arizona	2008-2012	3.4	0.8	0.4	0.2
Arkansas	2008-2012	5.6	1.3	0.5	0.1
Arkansas	2008-2012	5.2	1.4	0.5	0.1
Arkansas	2008-2012	7.5	1	0.3	0.2
California	2008-2012	3.7	1.5	0.4	0.2
California	2008-2012	3.8	1.7	0.4	0.2
California	2008-2012	4	0.9	0.4	0.2
California	2008-2012	2	0.5	0.1	-
California, Los Angeles County	2008-2012	4.3	1.7	0.5	0.2
California, Los Angeles County	2008-2012	4.4	1.9	0.5	0.2
California, Los Angeles County	2008-2012	3.1	1.8	0.5	0.1
California, Los Angeles County	2008-2012	5.7	2	0.6	0.3
California, Los Angeles County	2008-2012	4.5	0.8	0.5	0.1
California, Los Angeles County	2008-2012	3.9	0.7	0.1	0.1
California, Los Angeles County	2008-2012	3.2	2.2	0.9	-
California, Los Angeles County	2008-2012	3.5	1.4	0.6	-
California, San Francisco Bay Area	2008-2012	2.8	1.5	0.3	0.2
California, San Francisco Bay Area	2008-2012	2.8	1.8	0.3	0.2

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Table 4 – continued from previous page

Cancer registry[1]	Period	Squamo	Adeno	Other	Unspec.
California, San Francisco Bay Area	2008-2012	2.3	1.7	0.3	0.2
California, San Francisco Bay Area	2008-2012	4.5	2.1	0.2	0.2
California, San Francisco Bay Area	2008-2012	3.1	1	0.3	0.3
California, San Francisco Bay Area	2008-2012	1.9	0.6	0.2	0.1
California, San Francisco Bay Area	2008-2012	2.7	1.5	0.4	0.1
California, San Francisco Bay Area	2008-2012	2.3	0.6	1.2	-
Colorado	2008-2012	2.7	1.4	0.2	0.2
Colorado	2008-2012	2.7	1.4	0.2	0.2
Colorado	2008-2012	2.8	0.6	0.4	0.3
Connecticut	2008-2012	3	1.2	0.3	0.2
Connecticut	2008-2012	2.8	1.4	0.4	0.1
Connecticut	2008-2012	3.8	0.5	0.3	0.4
Delaware	2008-2012	4.2	1.6	0.5	0.2
Delaware	2008-2012	4.6	2	0.4	0.2
Delaware	2008-2012	4.1	0.7	0.9	0.2
Florida	2008-2012	4.6	1.4	0.3	0.2
Florida	2008-2012	4.4	1.5	0.3	0.2
Florida	2008-2012	6.6	1	0.4	0.3
Georgia	2008-2012	4.2	1.3	0.3	0.2
Georgia	2008-2012	4.1	1.6	0.3	0.2
Georgia	2008-2012	4.9	0.8	0.3	0.3
Georgia, Atlanta	2008-2012	3.5	1.2	0.3	0.2
Georgia, Atlanta	2008-2012	3.2	1.6	0.3	0.2
Georgia, Atlanta	2008-2012	4.3	0.9	0.3	0.3
Idaho	2008-2012	3.2	1.3	0.2	0.1
Illinois	2008-2012	4.3	1.3	0.4	0.1
Illinois	2008-2012	3.8	1.4	0.4	0.1
Illinois	2008-2012	7.8	0.8	0.6	0.2
Indiana	2008-2012	4.2	1.2	0.3	0.1
Indiana	2008-2012	4	1.3	0.3	0.1
Indiana	2008-2012	5.9	0.2	0.1	0.3
Iowa	2008-2012	3.6	1.4	0.4	0.2
Kentucky	2008-2012	4.7	1.4	0.4	0.2
Louisiana	2008-2012	5.6	1	0.3	0.2
Louisiana	2008-2012	5	1.2	0.4	0.1
Louisiana	2008-2012	7.3	0.8	0.3	0.3
Louisiana, New Orleans	2008-2012	5.9	0.7	0.3	0.2
Louisiana, New Orleans	2008-2012	4.9	0.8	0.4	0.1
Louisiana, New Orleans	2008-2012	7.8	0.5	0.2	0.3
Maine	2008-2012	2.9	1.5	0.3	0
Maryland	2008-2012	3.1	1.3	0.3	0.1
Maryland	2008-2012	2.7	1.4	0.3	0.1
Maryland	2008-2012	4.3	0.8	0.3	0.1
Massachusetts	2008-2012	2.4	1.3	0.3	0
Massachusetts	2008-2012	2.3	1.3	0.3	0
Massachusetts	2008-2012	4.4	0.9	0.3	0

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Table 4 – continued from previous page

Cancer registry[1]	Period	Squamo	Adeno	Other	Unspec.
Michigan	2008-2012	3.5	1.3	0.4	0.1
Michigan	2008-2012	3.2	1.4	0.4	0.1
Michigan	2008-2012	5.2	0.8	0.4	0.2
Michigan, Detroit	2008-2012	3.9	1.3	0.4	0.2
Michigan, Detroit	2008-2012	3.2	1.5	0.4	0.1
Michigan, Detroit	2008-2012	6	0.8	0.5	0.2
Minnesota	2008-2012	3.1	1.2	0.3	0
Mississippi	2008-2012	5.7	1.2	0.3	0.1
Missouri	2008-2012	4.3	1.6	0.3	0.1
Missouri	2008-2012	4.2	1.7	0.4	0.1
Missouri	2008-2012	6.1	1.1	0.2	0.2
Montana	2008-2012	3.2	1.3	0.3	0.2
Nebraska	2008-2012	3.7	1.5	0.2	0
Nebraska	2008-2012	3.7	1.5	0.1	0.1
Nebraska	2008-2012	4.2	1.7	-	-
Nevada	2008-2012	3.9	1.1	0.3	0.2
Nevada	2008-2012	4	1.3	0.2	0.2
Nevada	2008-2012	3.7	0.8	0.4	0.3
New Hampshire	2008-2012	2.4	1.3	0.2	0.1
New Jersey	2008-2012	4	1.5	0.3	0.2
New Jersey	2008-2012	3.7	1.6	0.4	0.2
New Jersey	2008-2012	6.1	1	0.3	0.2
New Mexico	2008-2012	4.1	1.3	0.2	0.2
New Mexico	2008-2012	4.3	1.2	0.2	0.2
New Mexico	2008-2012	4.7	1.1	0.3	0.2
New Mexico	2008-2012	3.9	1.3	0.1	0.2
New York State	2008-2012	4	1.4	0.3	0.2
New York State	2008-2012	3.5	1.5	0.3	0.1
New York State	2008-2012	6.1	0.9	0.4	0.3
North Carolina	2008-2012	3.6	1.2	0.3	0.2
North Carolina	2008-2012	3.3	1.4	0.4	0.1
North Carolina	2008-2012	4.9	0.9	0.3	0.2
North Dakota	2008-2012	3.4	1.5	0.3	0
Ohio	2008-2012	3.9	1.3	0.3	0.1
Ohio	2008-2012	3.8	1.4	0.3	0.1
Ohio	2008-2012	4.4	0.9	0.3	0.1
Oklahoma	2008-2012	4.8	1.6	0.3	0.3
Oklahoma	2008-2012	4.8	1.7	0.3	0.3
Oklahoma	2008-2012	5	0.5	0.2	0.3
Oregon	2008-2012	3.3	1.5	0.3	0.1
Oregon	2008-2012	3.1	1.5	0.3	0.1
Oregon	2008-2012	4.1	0.4	-	-
Pennsylvania	2008-2012	4.1	1.3	0.4	0.1
Pennsylvania	2008-2012	3.8	1.3	0.4	0.1
Pennsylvania	2008-2012	6.4	0.9	0.5	0.2
Rhode Island	2008-2012	3.3	1.1	0.4	-
Rhode Island	2008-2012	3.3	1.2	0.5	-

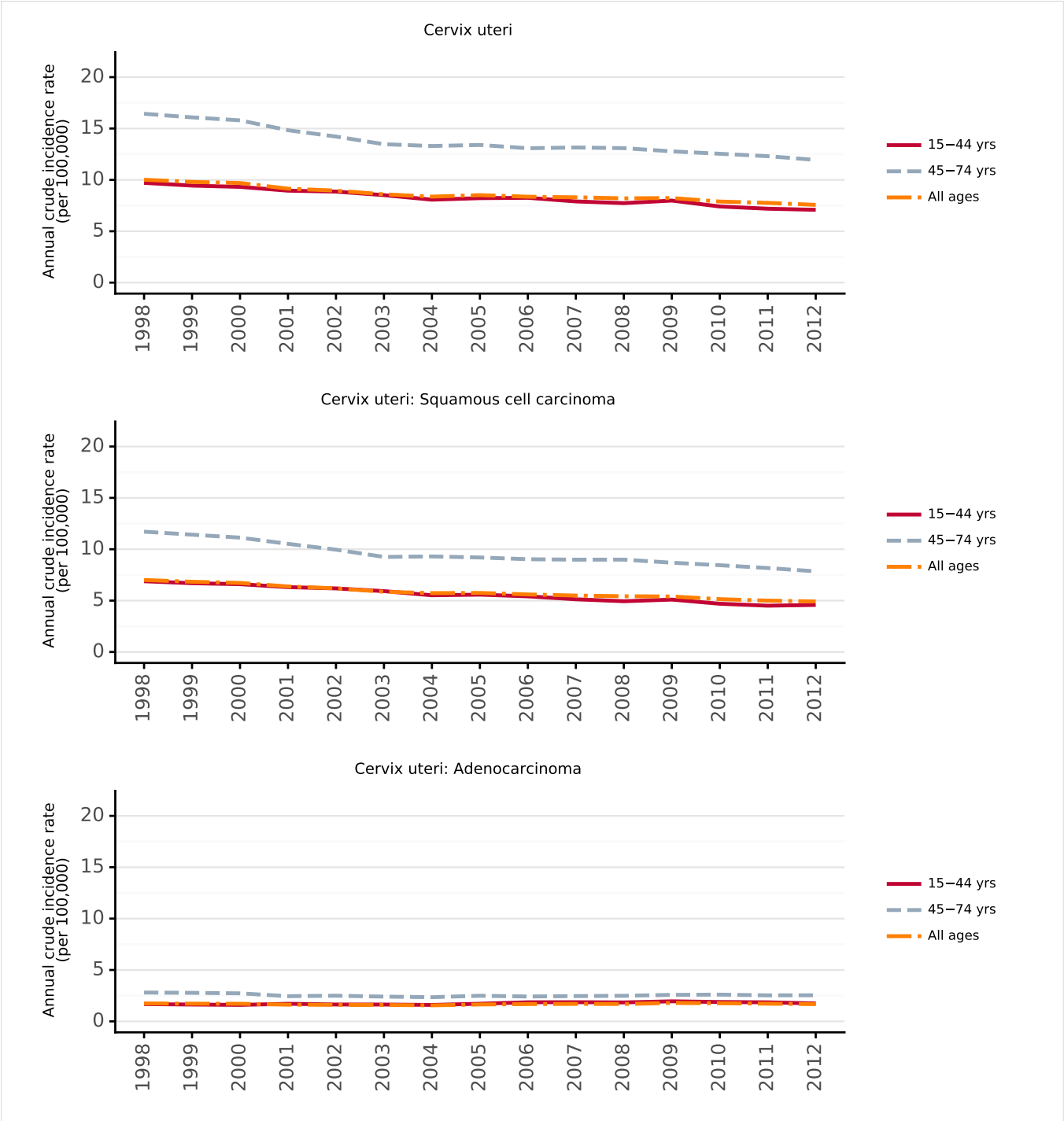
Continued on next page

Table 4 – continued from previous page

Cancer registry[1]	Period	Squamo	Adeno	Other	Unspec.
Rhode Island	2008-2012	2.7	0.5	-	-
South Carolina	2008-2012	4.2	1.1	0.3	0.2
South Carolina	2008-2012	3.9	1.3	0.3	0.2
South Carolina	2008-2012	5.1	0.8	0.3	0.1
South Dakota	2008-2012	3.4	1.5	0.4	0.1
Tennessee	2008-2012	4.6	1.4	0.3	0.2
Tennessee	2008-2012	4.4	1.5	0.3	0.2
Tennessee	2008-2012	6.1	1.3	0.4	0.2
Texas	2008-2012	4.6	1.3	0.4	0.3
Texas	2008-2012	4.6	1.4	0.4	0.3
Texas	2008-2012	5.7	1	0.5	0.3
Utah	2008-2012	2.7	1	0.2	0.1
Vermont	2008-2012	2	1	0.1	0.1
Virginia	2008-2012	3.2	1.1	0.2	0.1
Virginia	2008-2012	2.9	1.2	0.2	0.1
Virginia	2008-2012	4.2	0.8	0.3	0.1
Washington State	2008-2012	3.2	1.6	0.3	0.2
Washington, Seattle	2008-2012	3.2	1.7	0.3	0.2
West Virginia	2008-2012	5.5	1.7	0.4	0.2
Wisconsin	2008-2012	3.1	1.2	0.2	0.1
Wisconsin	2008-2012	2.8	1.2	0.2	0.1
Wisconsin	2008-2012	7.1	1.1	0.4	0.1
Wyoming	2008-2012	4.5	1.6	0.5	0.1
Hawaii	2008-2012	4.1	1.4	0.2	0.2
Hawaii	2008-2012	4.1	1.5	0.3	-
Hawaii	2008-2012	3	1.2	0.1	0.1
Hawaii	2008-2012	2.4	0.3	-	0.2
Hawaii	2008-2012	3.7	1.4	-	0.4
Hawaii	2008-2012	3.5	2.4	0.5	0.3
Pacific Islands	2008-2012	10.4	2.1	1.4	0.4

Data accessed on 5 Oct 2018
Rates per 100,000 women per year.
Standarized rates have been estimated using the direct method and the World population as the references.
Adeno: adenocarcinoma; Other: Other carcinoma; Squamous: Squamous cell carcinoma; Unspec: Unspecified carcinoma;
Data Sources:
[1] Bray F, Colombet M, Mery L, Piñeros M, Znaor A, Zanetti R and Ferlay J, editors (2017). Cancer Incidence in Five Continents, Vol. XI (electronic version). Lyon: International Agency for Research on Cancer. Available from: http://ci5.iarc.fr, accessed [05 October 2018].

Figure 10: Time trends in cervical cancer incidence in United States of America (cancer registry data)



Data accessed on 28 Aug 2018

The following regional cancer registries provided data and contributed to their national estimate: NPCR (All states (excl. Connecticut, Hawaii, Iowa, New Mexico and Utah) and Washington DC)

[a] Estimated annual percentage change based on the trend variable from the net drift for 35 years, from 1975-2009.

Data Sources:

Ferlay J, Colombet M and Bray F. Cancer Incidence in Five Continents, CI5plus: IARC CancerBase No. 9 [Internet]. Lyon, France: International Agency for Research on Cancer; 2018. Available from: http://ci5.iarc.fr

Vaccarella S, Lortet-Tieulent J, Plummer M, Franceschi S, Bray F. Worldwide trends in cervical cancer incidence: Impact of screening against changes in disease risk factors. eur J Cancer 2013;49:3262-73.

3.3.3 Cervical cancer mortality in United States of America

Key Stats.

About **5,706 cervical cancer deaths occur annually in United States of America** are diagnosed **annually** (estimations for 2020).

Cervical cancer **ranks* as the 12th leading cause of cancer deaths** of female cancer deaths in **United States of America**.

Cervical cancer is the **3rd leading cause of cancer deaths** in **women aged 15 to 44 years in United States of America**.

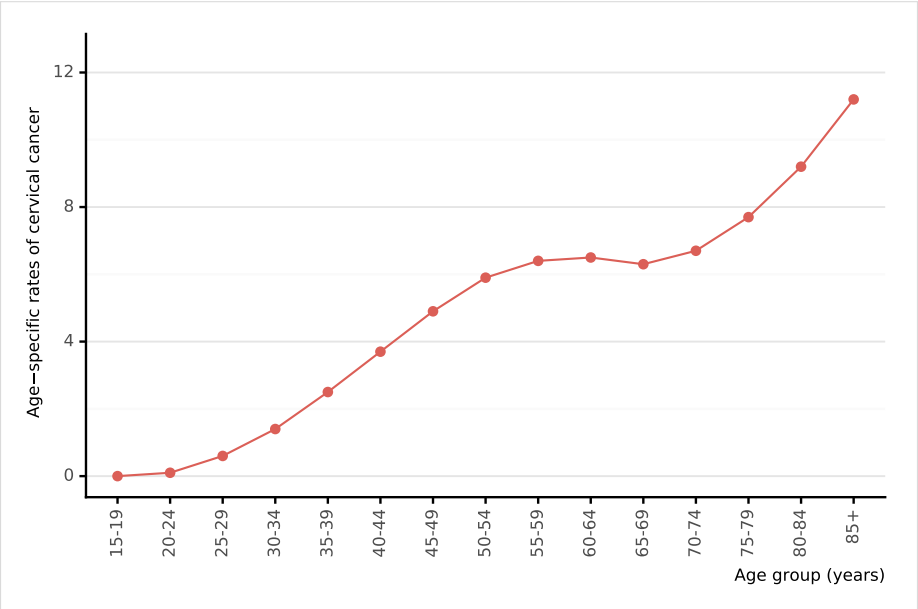
* Ranking of cervical cancer incidence to other cancers among all women according to highest incidence rates (ranking 1st) excluding non-melanoma skin cancer. Ranking is based on crude incidence rates (actual number of cervical cancer cases). Ranking using age-standardized rate (ASR) may differ.

Table 5: Cervical cancer mortality in United States of America (estimates for 2020)

Indicator	United States of America	Northern America	World
Annual number of deaths	5,706	6,343	341,831
Uncertainty intervals of mortality cancer cases [95% UI]	[5,382-6,050]	[6,163-6,528]	[324,231-360,386]
Crude mortality rate[b]	3.41	3.40	8.84
Age-standardized mortality rate[b]	2.12	2.10	7.25
Cumulative risk (%) at 75 years old[a]	0.22	0.22	0.82

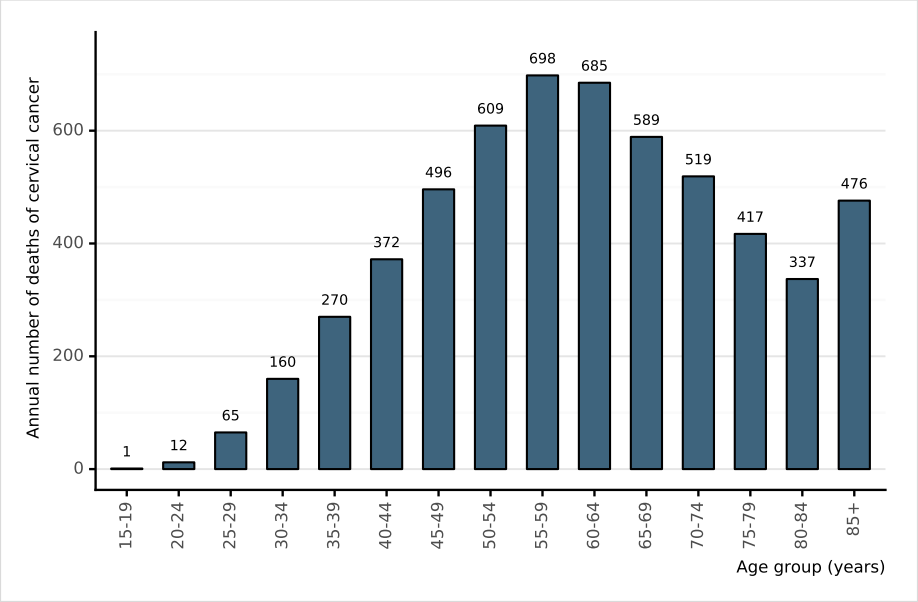
Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Cumulative risk (mortality) is the probability or risk of individuals dying from the disease during ages 0-74 years. For cancer, it is expressed as the % of new born children who would be expected to die from a particular cancer before the age of 75 if they had the rates of cancer observed in the period in the absence of competing causes.
[b] Rates per 100,000 women per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 11: Age-specific mortality rates of cervical cancer in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Rates per 100,000 women per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 12: Annual number of deaths of cervical cancer in United States of America (estimates for 2020)

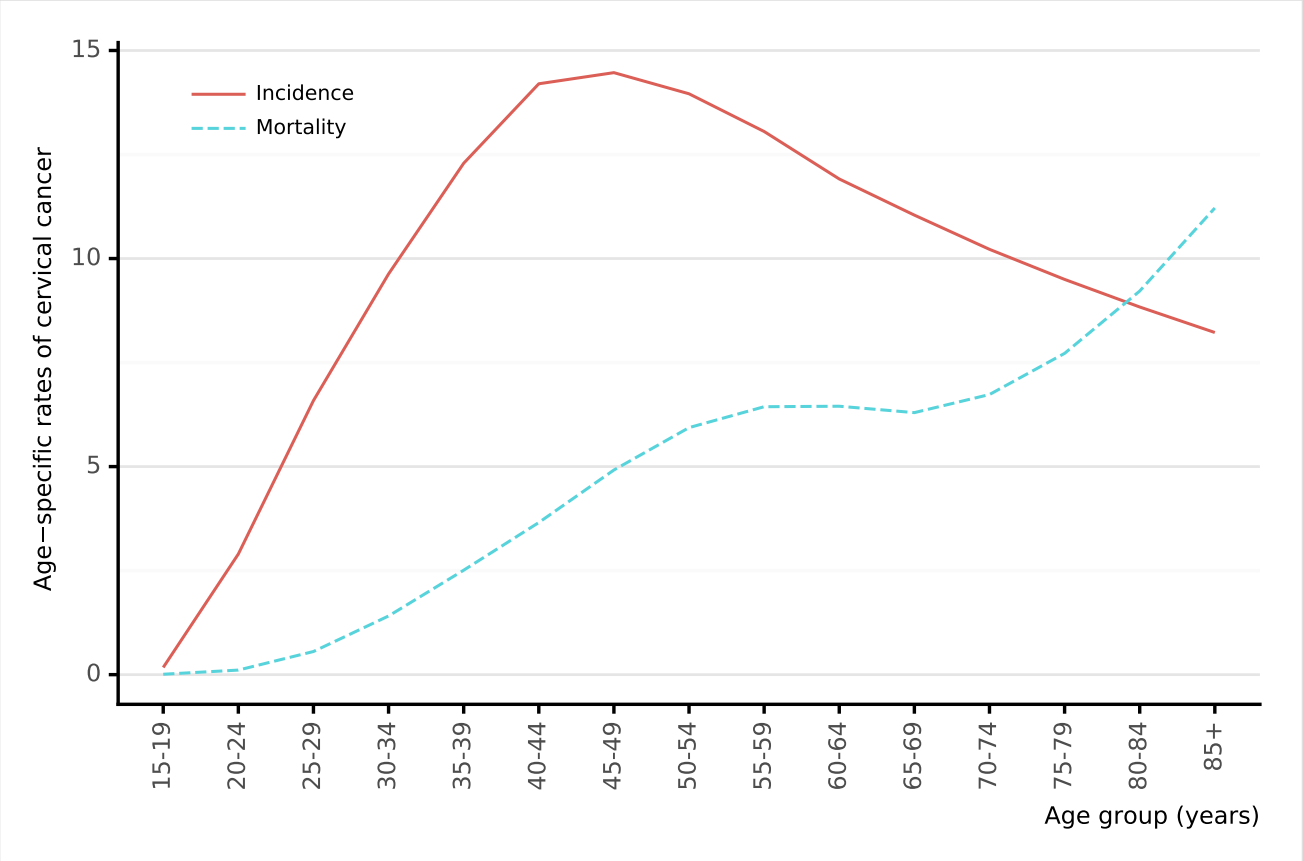


Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

- For age-standardised mortality rates of cervical cancer of United States of America (estimates for 2020) please refer to Figure 105
- For annual number of deaths of cervical cancer by age group in United States of America (estimates for 2020) please refer to Figure 106
- For comparison of age-specific cervical cancer mortality rates in United States of America, within the region, and the rest of world please refer to Figure 107

3.3.4 Cervical cancer incidence and mortality comparison in United States of America

Figure 13: Comparison of age-specific cervical cancer incidence and mortality rates in United States of America (estimates for 2020)



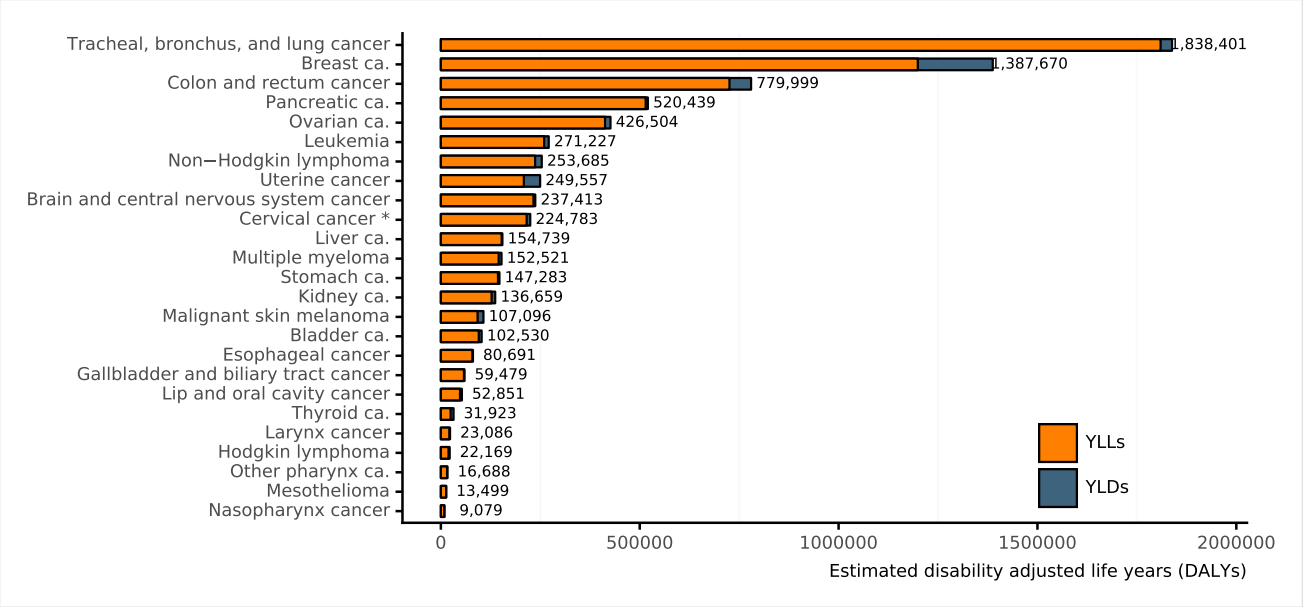
Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Rates per 100,000 women per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Table 6: Premature deaths and disability from cervical cancer in United States of America, Americas and the rest of the world (estimates for 2019)

	United States of America		Americas		World	
Indicator	**Number**	**Rate**	**Number**	**Rate**	**Number**	**Rate**
DALYs (95% UI)[a]	224,783 (193,184-237,126)	135 (116-142)	1,412,411 (1,274,478-1,573,926)	275 (248-306)	8,955,013 (7,547,733-9,978,462)	232 (196-259)
YLLs (95% UI)[b]	215,759 (186,049-227,379)	129 (112-136)	1,368,848 (1,234,552-1,524,455)	266 (240-296)	8,712,962 (7,365,279-9,728,886)	226 (191-252)
YLDs (95% UI)[c]	9,024 (5,956-12,594)	5 (4-8)	43,563 (30,364-58,147)	8 (6-11)	242,051 (171,644-326,024)	6 (4-8)

Data accessed on 29 Apr 2021
Rate per 100,000 women
[a] DALYs (95% UI): estimated disability adjusted life years (95% uncertainty interval)
[b] YLLs (95% UI): years of life lost (95% uncertainty interval)
[c] YLDs (95% UI): estimated years lived with disability (95% uncertainty interval)
Data Sources:
GBD 2019 Diseases and Injuries Collaborators. Global burden of 369 diseases and injuries in 204 countries and territories, 1990-2019: a systematic analysis for the Global Burden of Disease Study 2019. Lancet. 2020 Oct 17;396(10258):1204-1222

Figure 14: Comparison of annual premature deaths and disability from cervical cancer in United States of America to other cancers among women (estimates for 2019)



Data accessed on 29 Apr 2021

YLLs: years of life lost
YLDs: years lived with disability

Data Sources:

GBD 2019 Diseases and Injuries Collaborators. Global burden of 369 diseases and injuries in 204 countries and territories, 1990-2019: a systematic analysis for the Global Burden of Disease Study 2019. Lancet. 2020 Oct 17;396(10258):1204-1222

3.4 Anogenital cancers other than the cervix

Data on HPV role in anogenital cancers other than cervix are limited, but there is an increasing body of evidence strongly linking HPV DNA with cancers of anus, vulva, vagina, and penis. Although these cancers are much less frequent compared to cervical cancer, their association with HPV make them potentially preventable and subject to similar preventative strategies as those for cervical cancer. (Vaccine 2006, Vol. 24, Suppl 3; Vaccine 2008, Vol. 26, Suppl 10; Vaccine 2012, Vol. 30, Suppl 5; IARC Monographs 2007, Vol. 90).

3.4.1 Anal cancer

Anal cancer is rare in the general population with an average worldwide incidence of 1 per 100,000, but is reported to be increasing in more developed regions. Globally, there are an estimated 29,000 new cases in 2018 every year (de Martel C et al. Lancet Glob Health 2020;8(2):e180-e190). Women have higher incidences of anal cancer than men. Incidence is particularly high among populations of men who have sex with men (MSM), women with history of cervical or vulvar cancer, and immunosuppressed populations, including those who are HIV-infected and patients with a history of organ transplantation. These cancers are predominantly squamous cell carcinoma, adenocarcinomas, or basaloid and cloacogenic carcinomas.

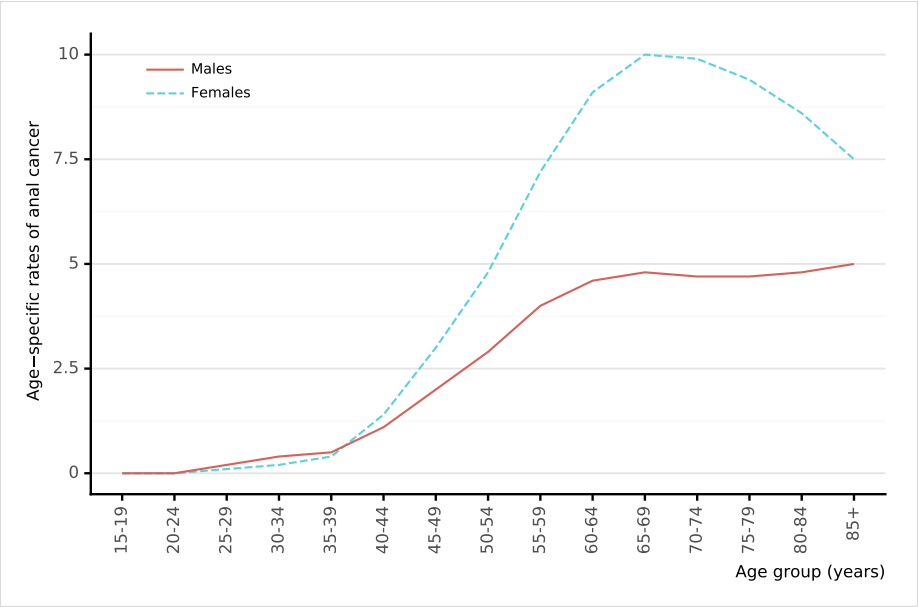
3.4.1.1 Anal cancer incidence in United States of America

Table 7: Anal cancer incidence in United States of America (estimates for 2020)

Indicator	United States of America	Northern America	World
MEN			
Annual number of new cancer cases	2,817	3,045	21,706
Uncertainty intervals of new cancer cases [95% UI]	[2,575-3,082]	[2,928-3,166]	[18,432-25,561]
Crude incidence rate[b]	1.72	1.67	0.55
Age-standardized incidence rate[b]	1.09	1.04	0.49
Cumulative risk (%) at 75 years old[a]	0.13	0.12	0.06
WOMEN			
Annual number of new cancer cases	5,602	6,132	29,159
Uncertainty intervals of new cancer cases [95% UI]	[5,277-5,947]	[5,964-6,305]	[25,656-33,140]
Crude incidence rate[c]	3.35	3.29	0.75
Age-standardized incidence rate[c]	1.87	1.83	0.58
Cumulative risk (%) at 75 years old[a]	0.23	0.22	0.07

Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Cumulative risk (incidence) is the probability or risk of individuals getting from the disease during ages 0-74 years. For cancer, it is expressed as the % of new born children who would be expected to develop from a particular cancer before the age of 75 if they had the rates of cancer observed in the period in the absence of competing causes.
[b] Rates per 100,000 men per year.
[c] Rates per 100,000 women per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 15: Age-specific incidence rates of anal cancer in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021

For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

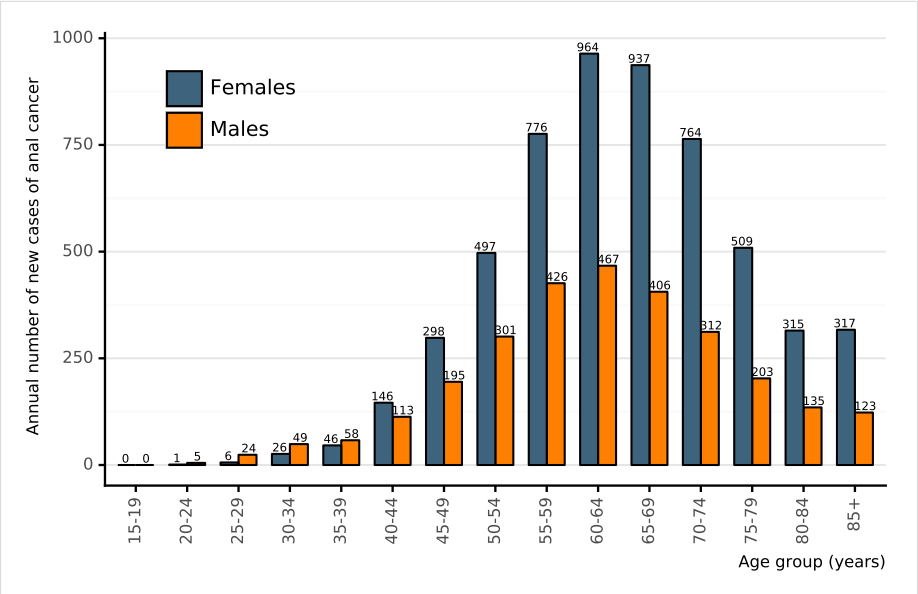
[a] Rates per 100,000 men per year.

[b] Rates per 100,000 women per year.

Data Sources:

Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 16: Annual number of new cases of anal cancer in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021

For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

Data Sources:

Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

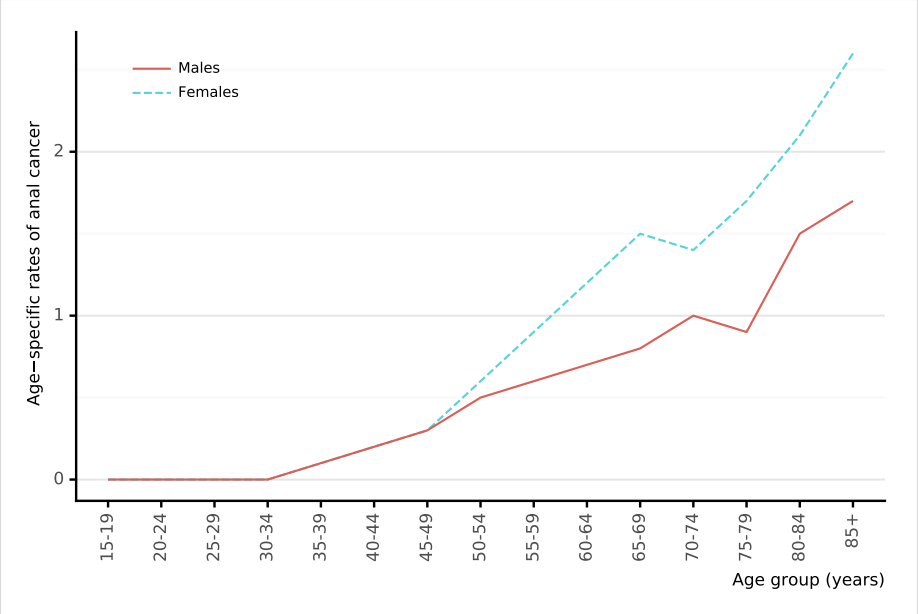
3.4.1.2 Anal cancer mortality in United States of America

Table 8: Anal cancer mortality in United States of America (estimates for 2020)

Indicator	United States of America	Northern America	World
MEN			
Annual number of new cancer cases	494	548	9,416
Uncertainty intervals of new cancer cases [95% UI]	[426-574]	[498-603]	[7,282-12,175]
Crude incidence rate[b]	0.30	0.30	0.24
Age-standardized incidence rate[b]	0.18	0.17	0.21
Cumulative risk (%) at 75 years old[a]	0.02	0.02	0.02
WOMEN			
Annual number of new cancer cases	880	974	9,877
Uncertainty intervals of new cancer cases [95% UI]	[783-989]	[906-1,048]	[7,795-12,516]
Crude incidence rate[c]	0.53	0.52	0.26
Age-standardized incidence rate[c]	0.27	0.26	0.19
Cumulative risk (%) at 75 years old[a]	0.03	0.03	0.02

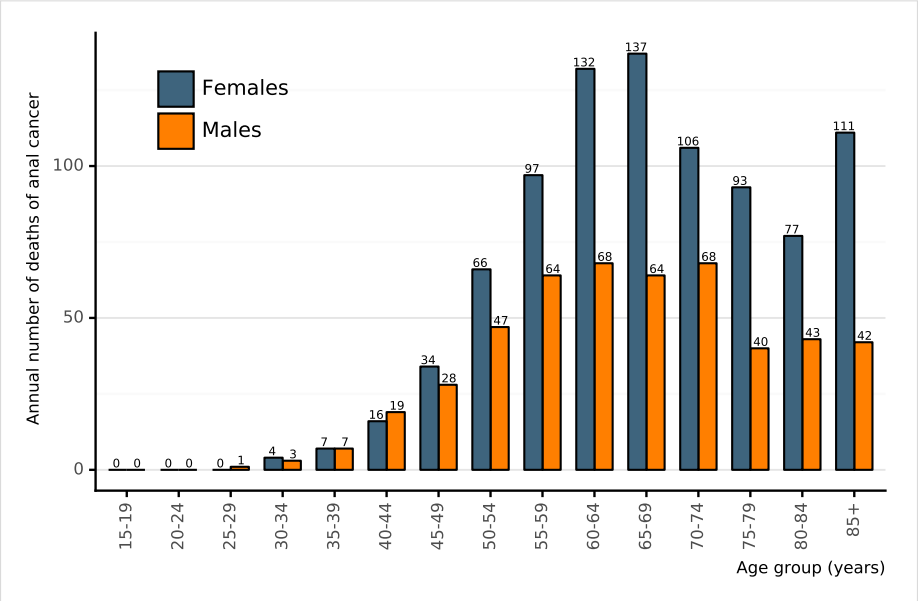
Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Cumulative risk (mortality) is the probability or risk of individuals dying from the disease during ages 0-74 years. For cancer, it is expressed as the % of new born children who would be expected to die from a particular cancer before the age of 75 if they had the rates of cancer observed in the period in the absence of competing causes.
[b] Rates per 100,000 men per year.
[c] Rates per 100,000 women per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 17: Age-specific mortality rates of anal cancer in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Rates per 100,000 men per year.
[b] Rates per 100,000 women per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

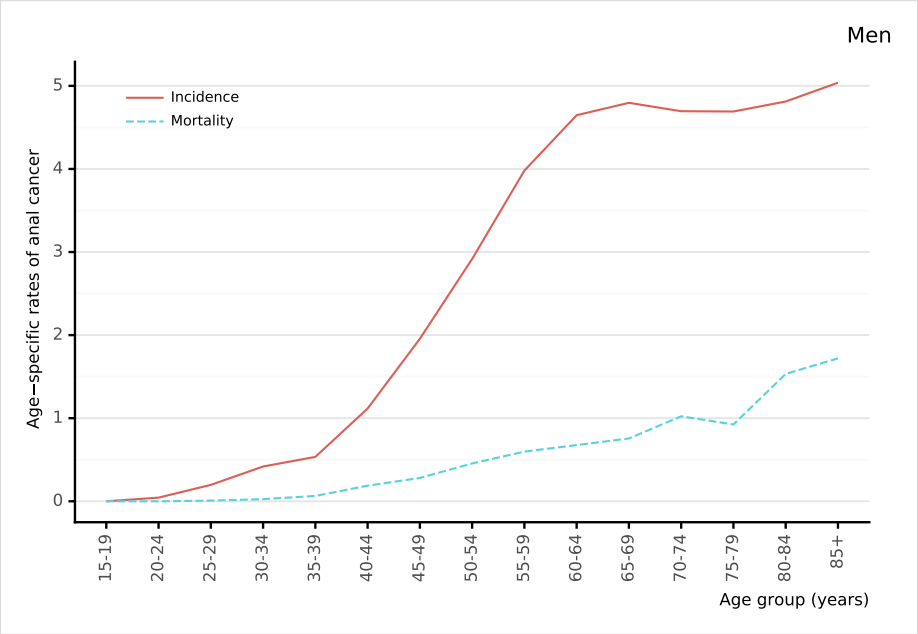
Figure 18: Annual number of deaths of of anal cancer in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

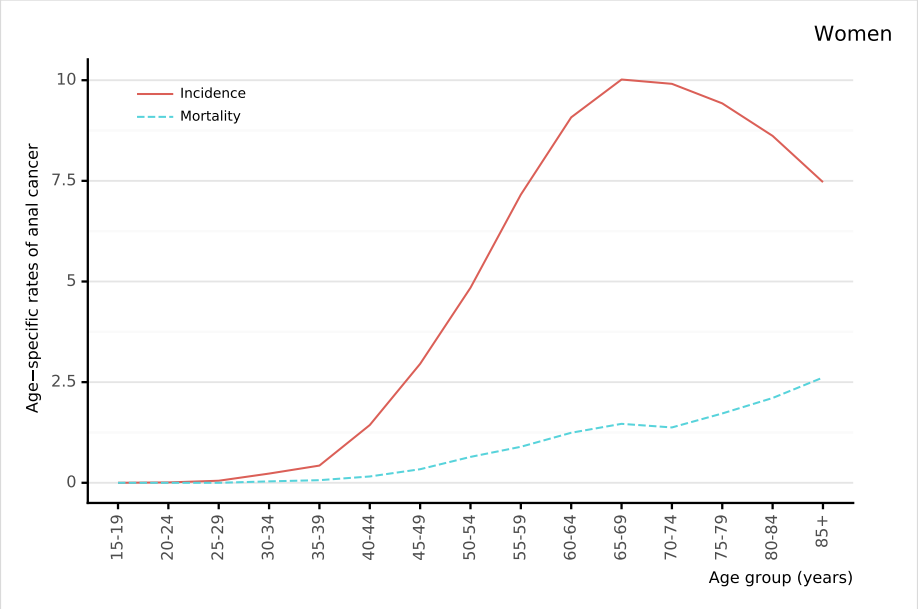
3.4.1.3 Anal cancer incidence and mortality comparison in United States of America

Figure 19: Comparison of age-specific anal cancer incidence and mortality rates among men in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Rates per 100,000 men per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 20: Comparison of age-specific anal cancer incidence and mortality rates among women in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Rates per 100,000 women per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

3.4.2 Vulva cancer

Cancer of the vulva is rare among women worldwide, with an estimated 44,000 new cases in 2018, representing 6% of all gynaecologic cancers (de Martel C et al. Lancet Glob Health 2020;8(2):e180-e190). Worldwide, about 60% of all vulvar cancer cases occur in more developed countries. Vulvar cancer has two distinct histological patterns with two different risk factor profiles: (1) basaloid/warty types (2) keratinising types. Basaloid/warty lesions are more common in young women, are very often associated with HPV DNA detection (75-100%), and have a similar risk factor profile as cervical cancer. Keratinising vulvar carcinomas represent the majority of the vulvar lesions (>60%), they occur more often in older women and are more rarely associated with HPV (IARC Monograph Vol 100B).

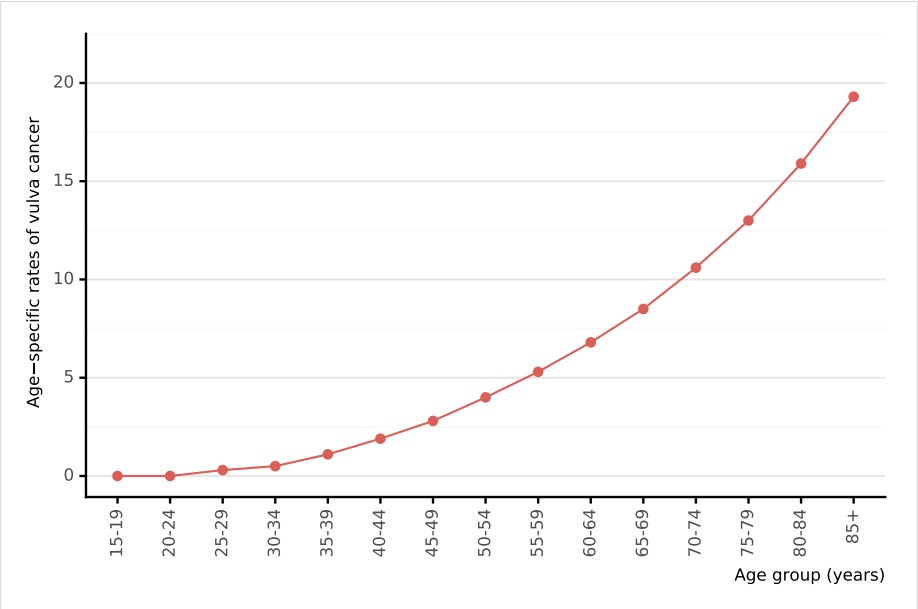
3.4.2.1 Vulva cancer incidence in United States of America

Table 9: Vulva cancer incidence in United States of America (estimates for 2020)

Indicator	United States of America	Northern America	World
Annual number of new cancer cases	6,112	7,046	45,240
Uncertainty intervals [95% UI]	[5,814-6,426]	[6,862-7,235]	[40,656-50,342]
Crude incidence rate[b]	3.66	3.78	1.17
Age-standardized incidence rate[b]	1.86	1.91	0.85
Cumulative risk (%) at 75 years old[a]	0.21	0.21	0.09

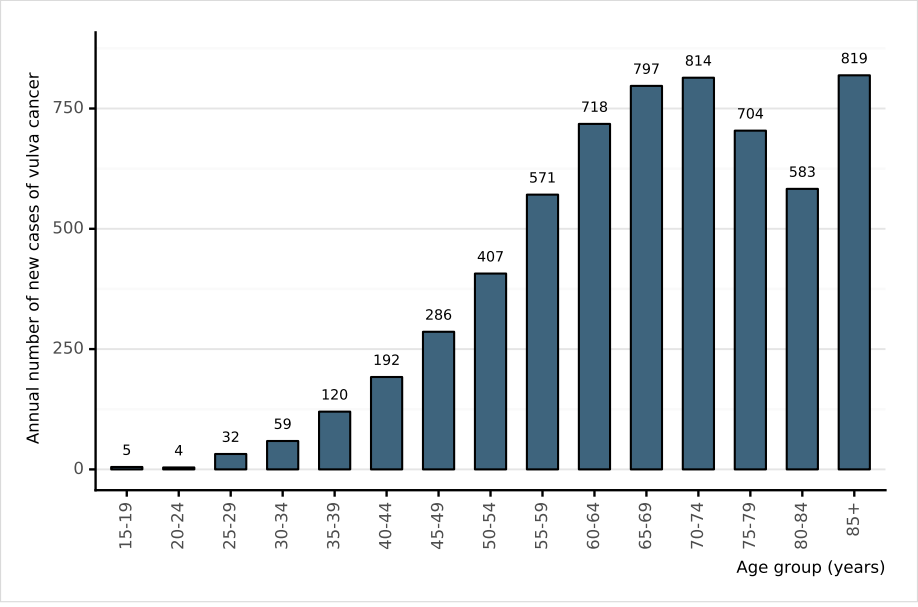
Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Cumulative risk (incidence) is the probability or risk of individuals getting from the disease during ages 0-74 years. For cancer, it is expressed as the % of new born children who would be expected to develop from a particular cancer before the age of 75 if they had the rates of cancer observed in the period in the absence of competing causes.
[b] Rates per 100,000 women per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 21: Age-specific incidence rates of vulva cancer in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Rates per 100,000 women per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 22: Annual number of new cases of vulva cancer in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

3.4.2.2 Vulva cancer mortality in United States of America

Table 10: Vulva cancer mortality in United States of America (estimates for 2020)

Indicator	United States of America	Northern America	World
Annual number of deaths	1,487	1,745	17,427
Uncertainty intervals [95% UI]	[1,351-1,636]	[1,651-1,844]	[14,497-20,950]
Crude mortality rate[b]	0.89	0.94	0.45
Age-standardized mortality rate[b]	0.35	0.36	0.30
Cumulative risk (%) at 75 years old[a]	0.03	0.04	0.03

Data accessed on 27 Jan 2021

For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

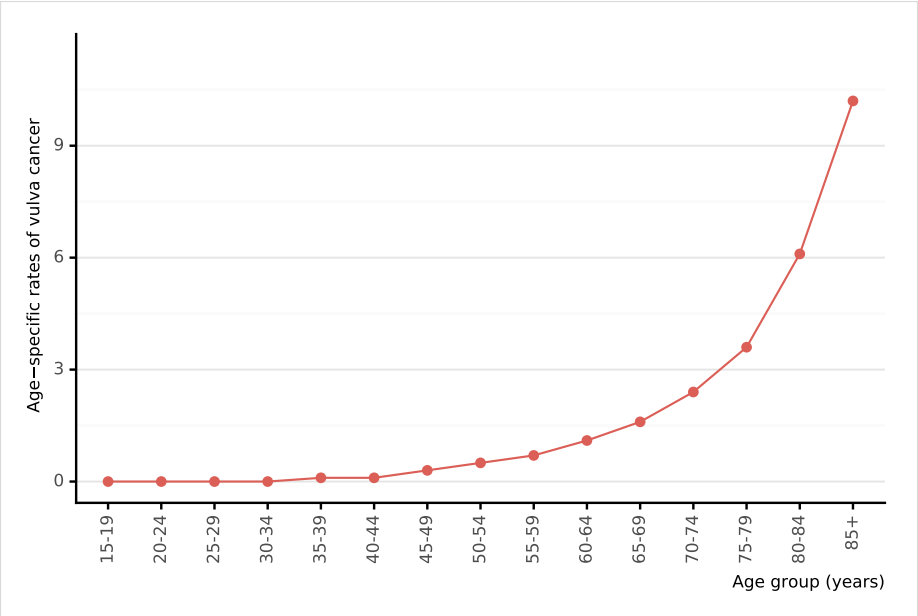
[a] Cumulative risk (mortality) is the probability or risk of individuals dying from the disease during ages 0-74 years. For cancer, it is expressed as the % of new born children who would be expected to die from a particular cancer before the age of 75 if they had the rates of cancer observed in the period in the absence of competing causes.

[b] Rates per 100,000 women per year.

Data Sources:

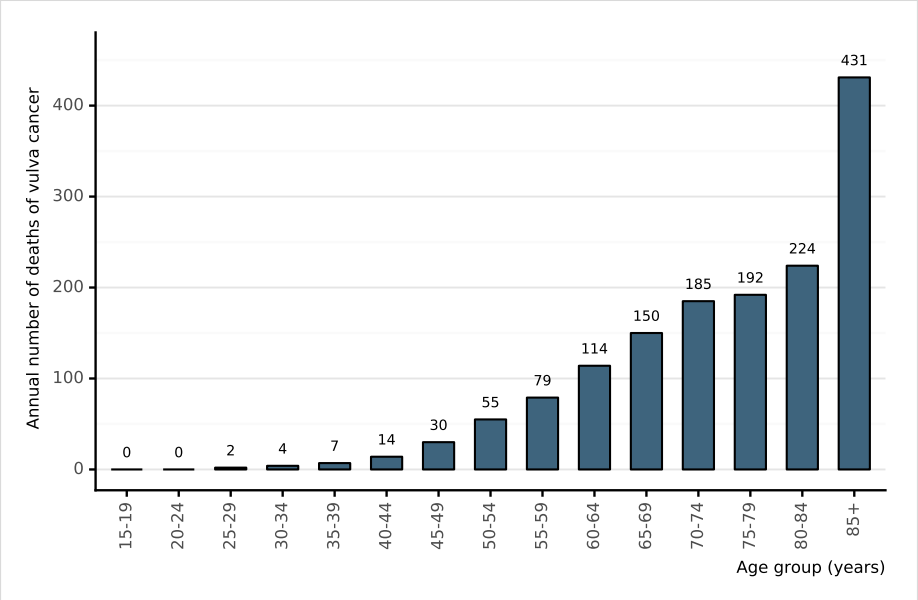
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 23: Age-specific mortality rates of vulva cancer in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Rates per 100,000 women per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

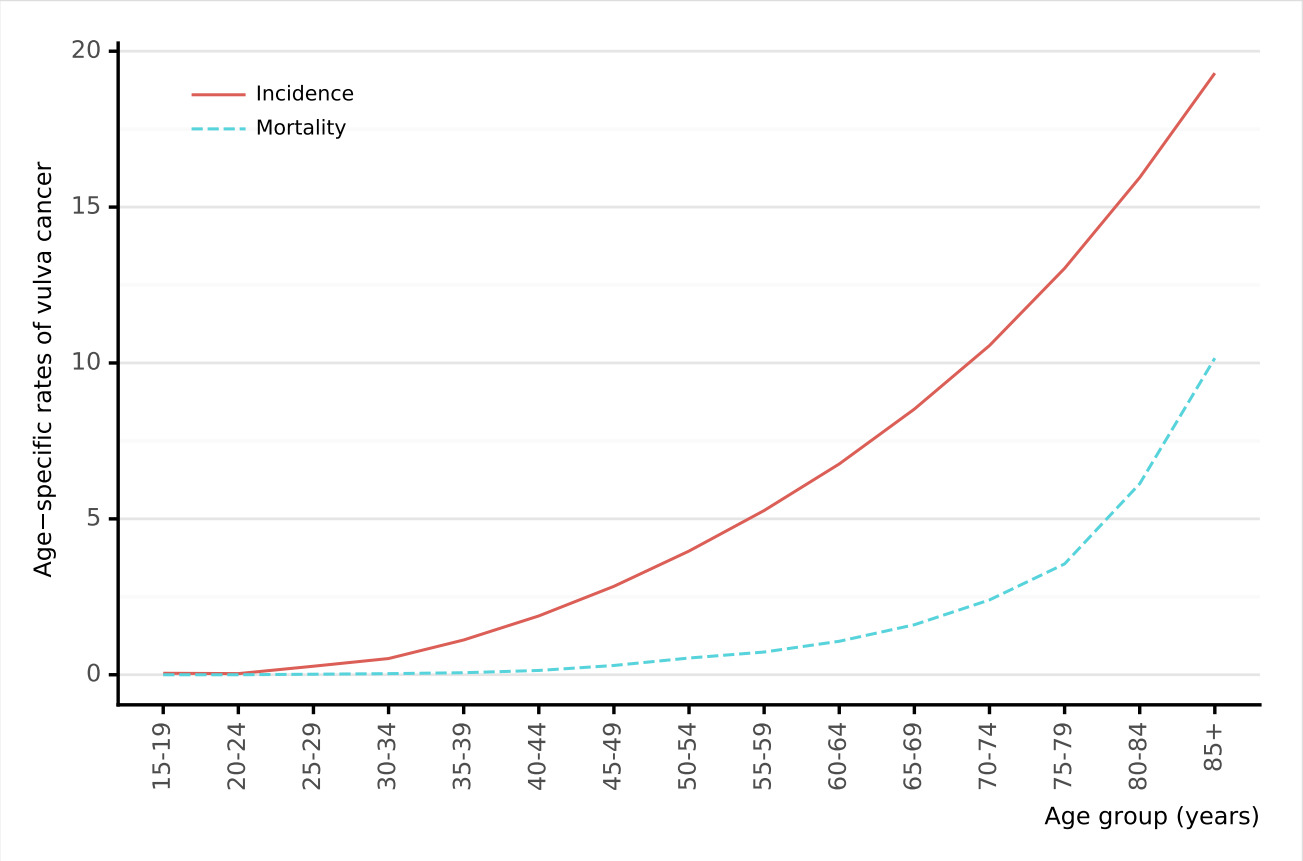
Figure 24: Annual number of deaths of vulva cancer in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Rates per 100,000 women per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

3.4.2.3 Vulva cancer incidence and mortality comparison in United States of America

Figure 25: Comparison of age-specific vulva cancer incidence and mortality rates in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Rates per 100,000 women per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

3.4.3 Vaginal cancer

Cancer of the vagina is a rare cancer, with an estimated 18,000 new cases in 2018, representing 3% of all gynaecologic cancers (de Martel C et al. Lancet Glob Health 2020;8(2):e180-e190). Similar to cervical cancer, the majority of vaginal cancer cases (68%) occur in less developed countries. Most vaginal cancers are squamous cell carcinoma (90%) generally attributable to HPV, followed by clear cell adenocarcinomas and melanoma. Vaginal cancers are primarily reported in developed countries. Metastatic cervical cancer can be misclassified as cancer of the vagina. Invasive vaginal cancer is diagnosed primarily in old women (>= 65 years) and the diagnosis is rare in women under 45 years whereas the peak incidence of carcinoma in situ is observed between ages 55 and 70 (Vaccine 2008, Vol. 26, Suppl 10).

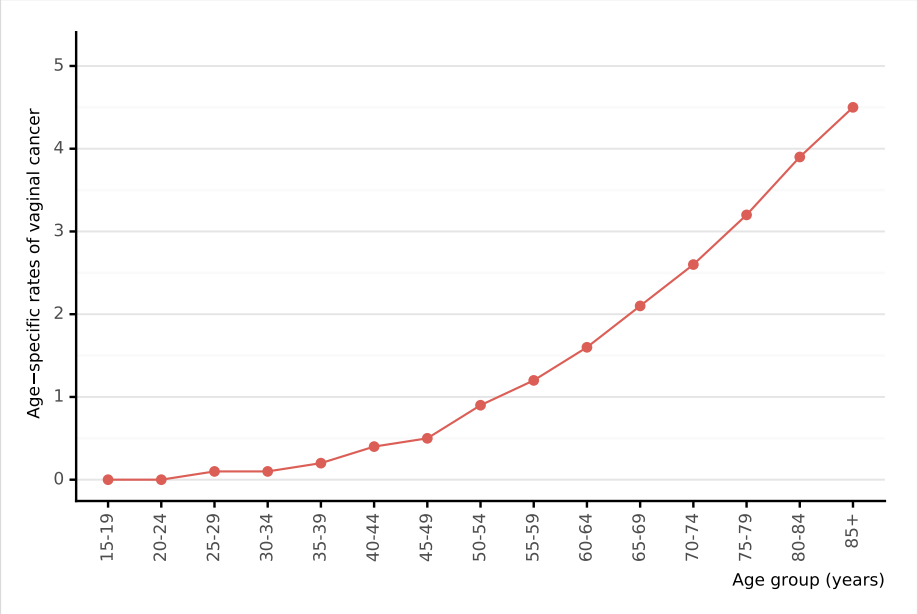
3.4.3.1 Vaginal cancer incidence in United States of America

Table 11: Vaginal cancer incidence in United States of America (estimates for 2020)

Indicator	United States of America	Northern America	World
Annual number of new cancer cases	1,446	1,627	17,908
Uncertainty intervals [95% UI]	[1,315-1,590]	[1,541-1,718]	[14,678-21,848]
Crude incidence rate[b]	0.86	0.87	0.46
Age-standardized incidence rate[b]	0.44	0.44	0.36
Cumulative risk (%) at 75 years old[a]	0.05	0.05	0.04

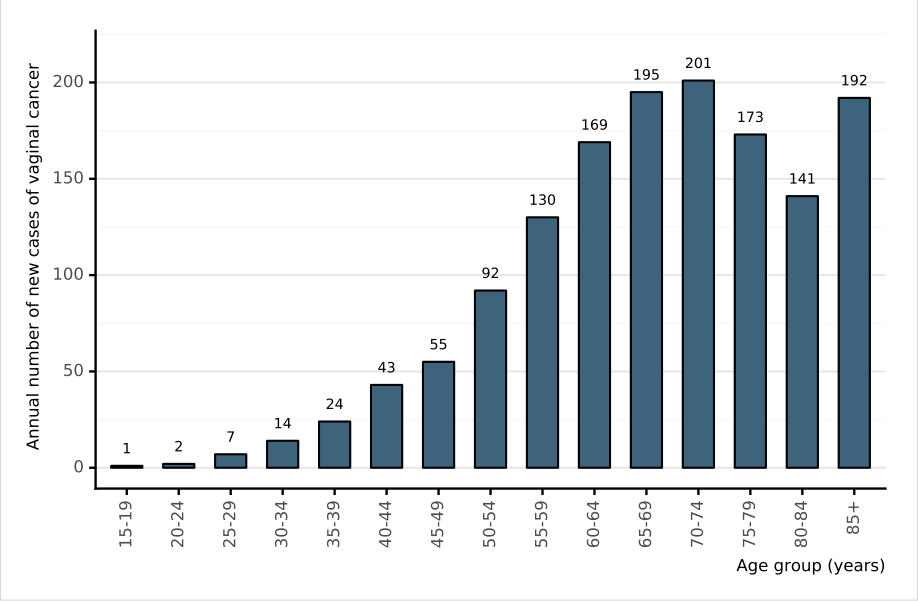
Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Cumulative risk (incidence) is the probability or risk of individuals getting from the disease during ages 0-74 years. For cancer, it is expressed as the % of new born children who would be expected to develop from a particular cancer before the age of 75 if they had the rates of cancer observed in the period in the absence of competing causes.
[b] Rates per 100,000 women per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 26: Age-specific incidence rates of vaginal cancer in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Rates per 100,000 women per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 27: Annual number of new cases of vaginal cancer in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

3.4.3.2 Vaginal cancer mortality in United States of America

Table 12: Vaginal cancer mortality in United States of America (estimates for 2020)

Indicator	United States of America	Northern America	World
Annual number of deaths	414	471	7,995
Uncertainty intervals [95% UI]	[359-478]	[424-524]	[5,983-10,684]
Crude mortality rate[b]	0.25	0.25	0.21
Age-standardized mortality rate[b]	0.10	0.10	0.16
Cumulative risk (%) at 75 years old[a]	0.01	0.01	0.02

Data accessed on 27 Jan 2021

For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

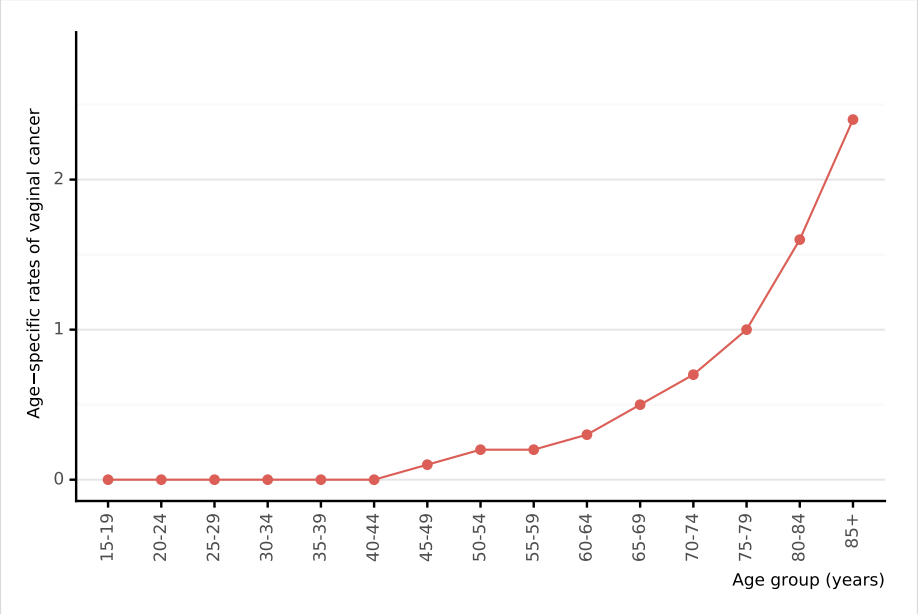
[a] Cumulative risk (mortality) is the probability or risk of individuals dying from the disease during ages 0-74 years. For cancer, it is expressed as the % of new born children who would be expected to die from a particular cancer before the age of 75 if they had the rates of cancer observed in the period in the absence of competing causes.

[b] Rates per 100,000 women per year.

Data Sources:

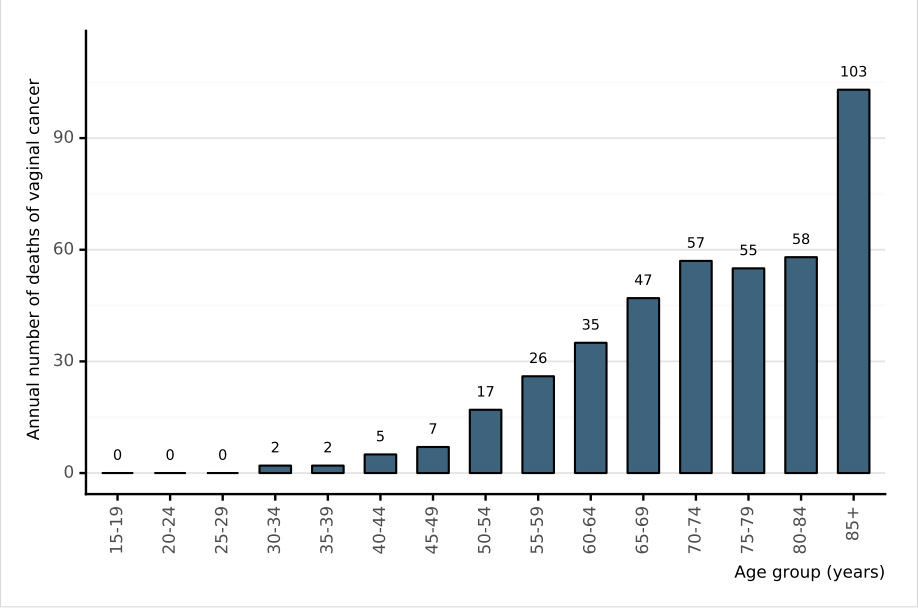
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 28: Age-specific mortality rates of vaginal cancer in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Rates per 100,000 women per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

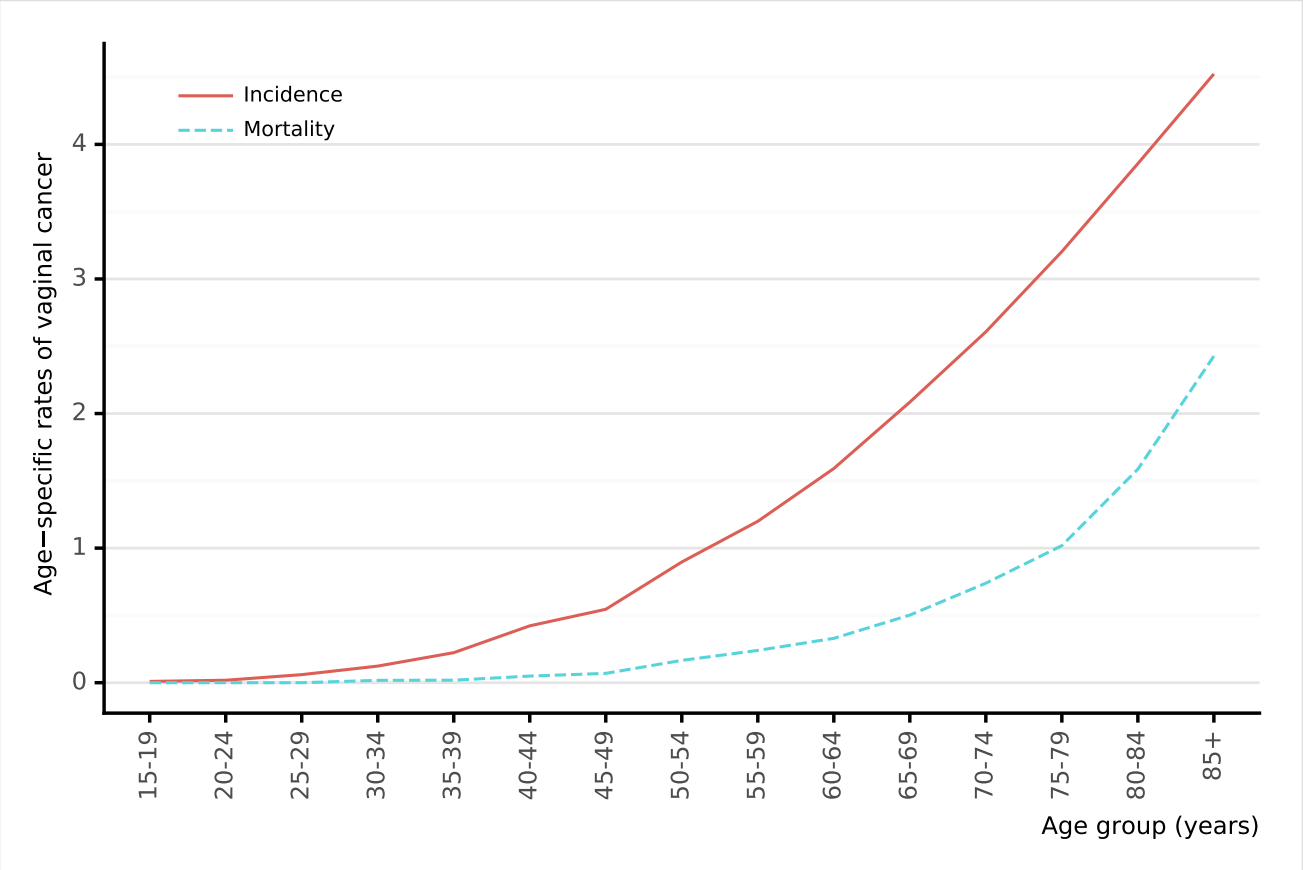
Figure 29: Annual number of deaths of vaginal cancer in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

3.4.3.3 Vaginal cancer incidence and mortality comparison in United States of America

Figure 30: Comparison of age-specific vaginal cancer incidence and mortality rates in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Rates per 100,000 women per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

3.4.4 Penile cancer

The annual burden of penile cancer has been estimated to be 34,000 cases in 2018 worldwide with incidence rates strongly correlating with those of cervical cancer (de Martel C et al. Lancet Glob Health 2020;8(2):e180-e190). Penile cancer is rare and most commonly affects men aged 50-70 years. Incidence rates are higher in less developed countries than in more developed countries, accounting for up to 10% of male cancers in some parts of Africa, South America and Asia. Precursor cancerous penile lesions (PeIN) are rare.

Cancers of the penis are primarily of squamous cell carcinomas (SCC) (95%) and the most common penile SCC histologic sub-types are keratinising (49%), mixed warty-basaloid (17%), verrucous (8%) warty (6%), and basaloid (4%). HPV is most commonly detected in basaloid and warty tumours but is less common in keratinising and verrucous tumours. Approximately 60-100% of PeIN lesions are HPV DNA positive.

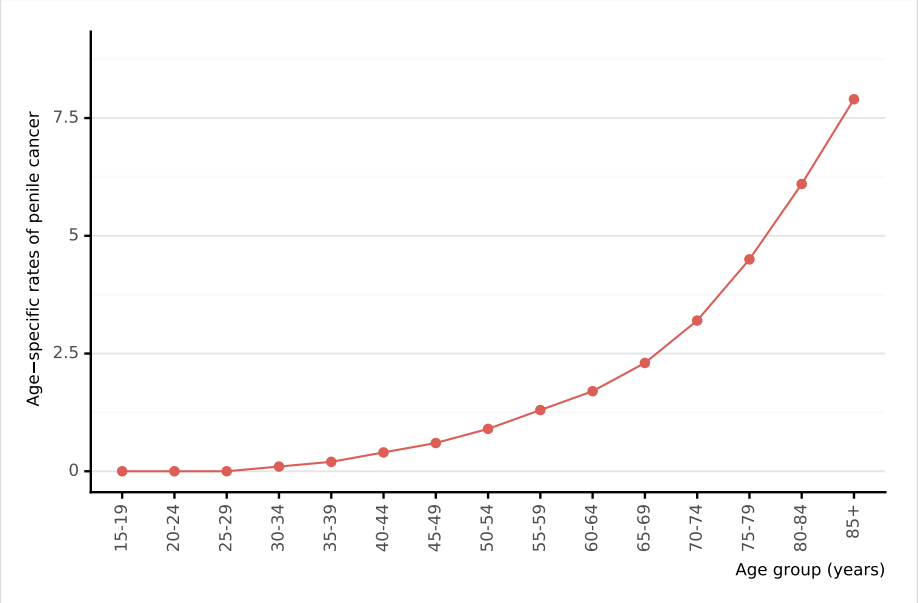
3.4.4.1 Penile cancer incidence in United States of America

Table 13: Penile cancer incidence in United States of America (estimates for 2020)

Indicator	United States of America	Northern America	World
Annual number of new cancer cases	1,515	1,741	36,068
Uncertainty intervals [95% UI]	[1,339-1,714]	[1,652-1,835]	[30,963-42,015]
Crude incidence rate[b]	0.92	0.95	0.92
Age-standardized incidence rate[b]	0.50	0.51	0.80
Cumulative risk (%) at 75 years old[a]	0.05	0.05	0.09

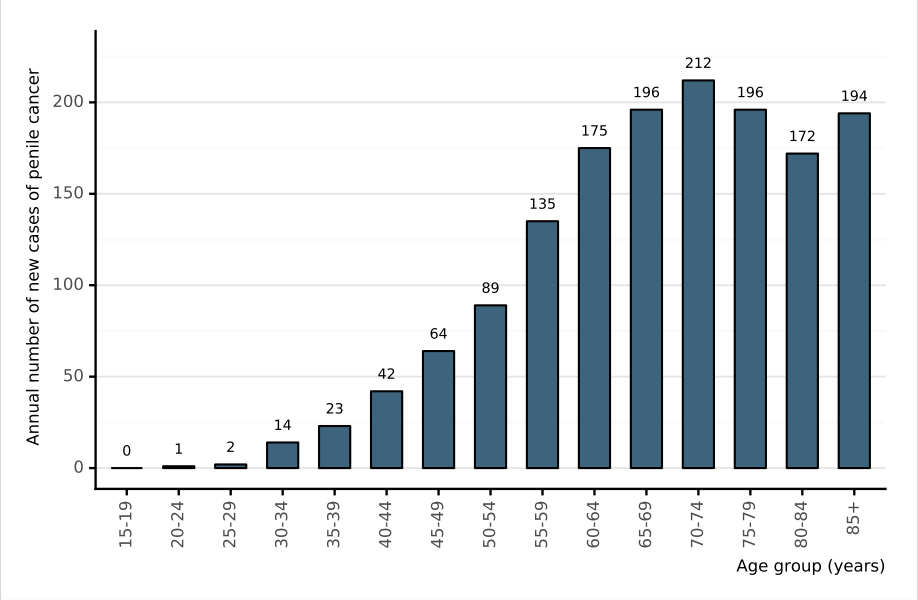
Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Cumulative risk (incidence) is the probability or risk of individuals getting from the disease during ages 0-74 years. For cancer, it is expressed as the % of new born children who would be expected to develop from a particular cancer before the age of 75 if they had the rates of cancer observed in the period in the absence of competing causes.
[b] Rates per 100,000 men per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 31: Age-specific incidence rates of penile cancer in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Rates per 100,000 men per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 32: Annual number of new cases of penile cancer in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

3.4.4.2 Penile cancer mortality in United States of America

Table 14: Penile cancer mortality in United States of America (estimates for 2020)

Indicator	United States of America	Northern America	World
Annual number of deaths	414	477	13,211
Uncertainty intervals [95% UI]	[350-489]	[430-530]	[10,687-16,332]
Crude mortality rate[b]	0.25	0.26	0.34
Age-standardized mortality rate[b]	0.13	0.13	0.29
Cumulative risk (%) at 75 years old[a]	0.01	0.01	0.03

Data accessed on 27 Jan 2021

For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

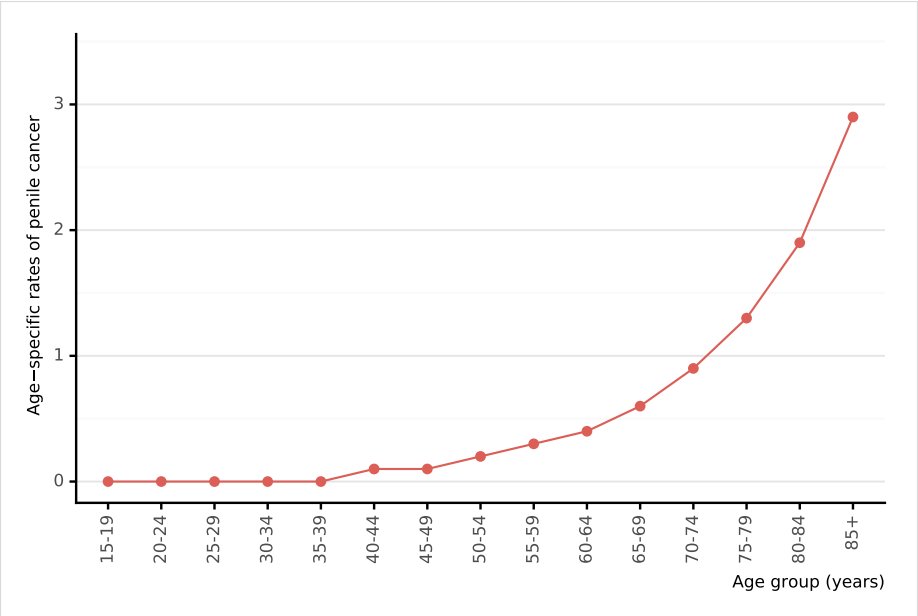
[a] Cumulative risk (mortality) is the probability or risk of individuals dying from the disease during ages 0-74 years. For cancer, it is expressed as the % of new born children who would be expected to die from a particular cancer before the age of 75 if they had the rates of cancer observed in the period in the absence of competing causes.

[b] Rates per 100,000 men per year.

Data Sources:

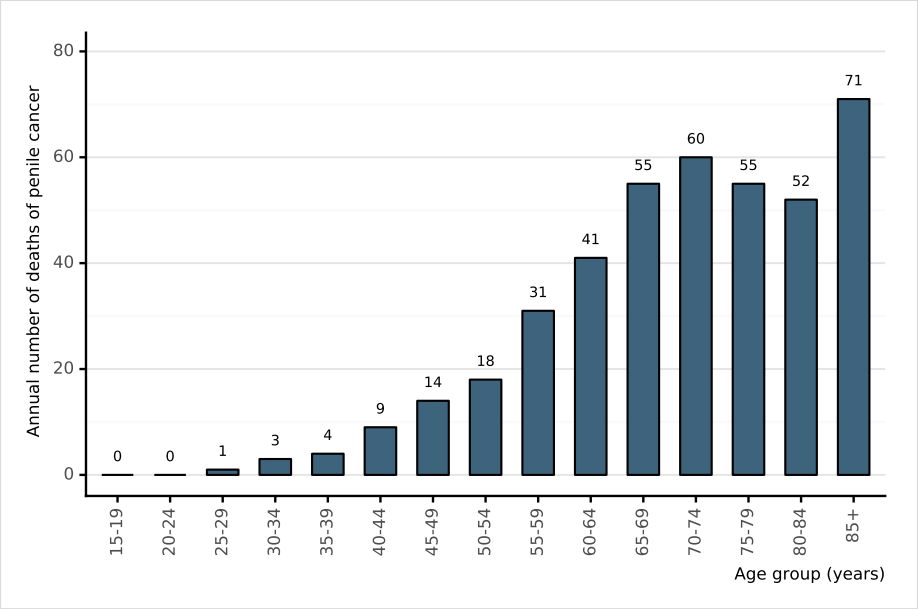
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 33: Age-specific mortality rates of penile cancer in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Rates per 100,000 men per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

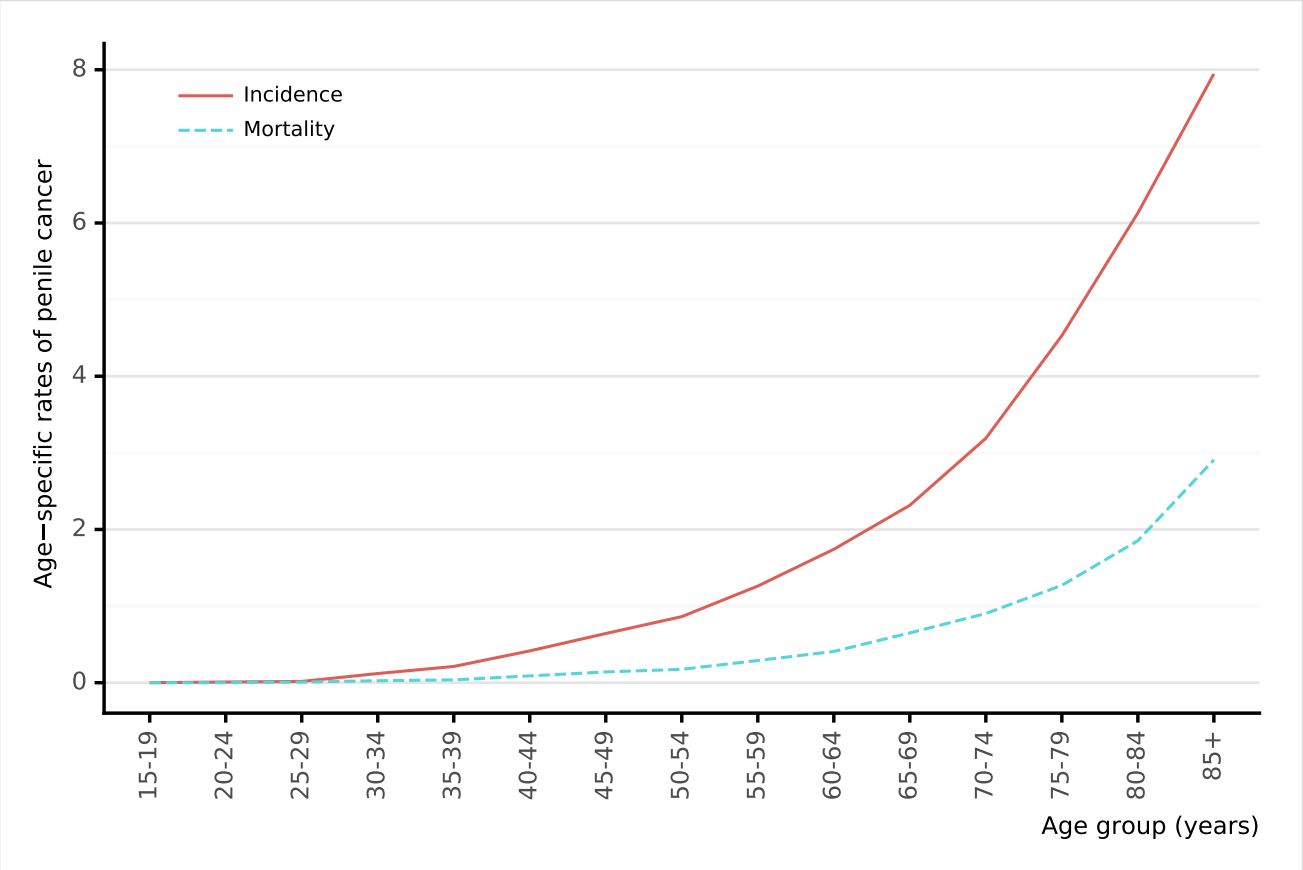
Figure 34: Annual number of deaths of penile cancer in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

3.4.4.3 Penile cancer incidence and mortality comparison in United States of America

Figure 35: Comparison of age-specific penile cancer incidence and mortality rates in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Rates per 100,000 men per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

3.5 Head and neck cancers

The majority of head and neck cancers are associated with high tobacco and alcohol consumption. However, increasing trends in the incidence at specific sites suggest that other aetiological factors are involved, and infection by certain high-risk types of HPV (i.e. HPV16) have been reported to be associated with head and neck cancers, in particular with oropharyngeal cancer. Current evidence suggests that HPV16 is associated with tonsil cancer (including Waldeyer ring cancer), base of tongue cancer and other oropharyngeal cancer sites. Associations with other head and neck cancer sites such as oral cancer are neither strong nor consistent when compared to molecular-epidemiological data on HPV and oropharyngeal cancer. Association with laryngeal cancer is still unclear (IARC Monograph Vol 100B)

3.5.1 Oropharyngeal cancer

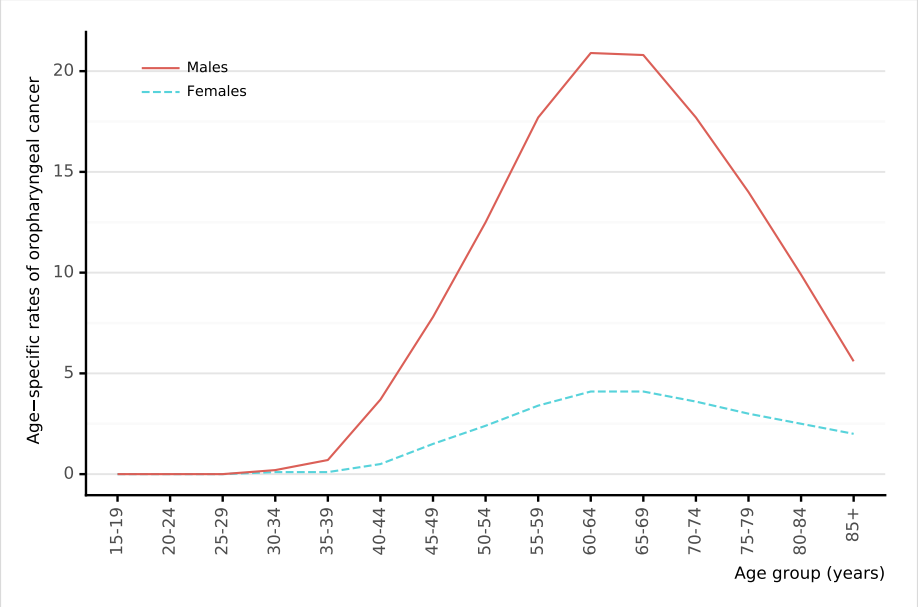
3.5.1.1 Oropharyngeal cancer incidence in United States of America

Table 15: Oropharyngeal cancer incidence in United States of America (estimates for 2020)

Indicator	United States of America	Northern America	World
MEN			
Annual number of new cancer cases	10,499	11,518	79,045
Uncertainty intervals of new cancer cases [95% UI]	[9,892-11,143]	[11,287-11,753]	[72,769-85,862]
Crude incidence rate sa[b]	6.41	6.31	2.01
Age-standardized incidence rate sa[b]	4.11	4.01	1.79
Cumulative risk (%) at 75 years old[a]	0.51	0.50	0.22
WOMEN			
Annual number of new cancer cases	2,276	2,508	19,367
Uncertainty intervals of new cancer cases [95% UI]	[2,047-2,531]	[2,401-2,620]	[16,279-23,041]
Crude incidence rate sa[c]	1.36	1.35	0.50
Age-standardized incidence rate sa[c]	0.80	0.79	0.40
Cumulative risk (%) at 75 years old[a]	0.10	0.10	0.05

Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Cumulative risk (incidence) is the probability or risk of individuals getting from the disease during ages 0-74 years. For cancer, it is expressed as the % of new born children who would be expected to develop from a particular cancer before the age of 75 if they had the rates of cancer observed in the period in the absence of competing causes.
[b] Rates per 100,000 men per year.
[c] Rates per 100,000 women per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 36: Age-specific incidence rates of oropharyngeal cancer in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Rates per 100,000 men per year.
[b] Rates per 100,000 women per year.
Data Sources:
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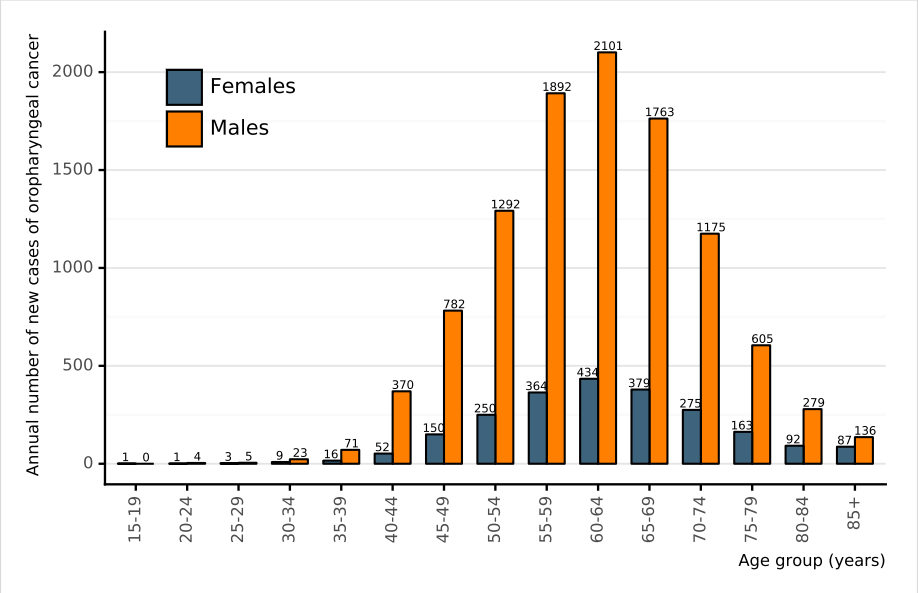
Figure 37: Annual number of new cases of oropharyngeal cancer in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

3.5.1.2 Oropharyngeal cancer mortality in United States of America

Table 16: Oropharyngeal cancer mortality in United States of America (estimates for 2020)

Indicator	United States of America	Northern America	World
MEN			
Annual number of deaths	2,513	2,860	39,590
Uncertainty intervals of mortality cancer cases [95% UI]	[2,358-2,678]	[2,741-2,984]	[35,255-44,458]
Crude mortality rate sa[b]	1.53	1.57	1.01
Age-standardized mortality rate sa[b]	0.86	0.87	0.89
Cumulative risk (%) at 75 years old[a]	0.11	0.11	0.11
WOMEN			
Annual number of deaths	687	801	8,553
Uncertainty intervals of mortality cancer cases [95% UI]	[612-772]	[738-869]	[6,684-10,945]
Crude mortality rate sa[c]	0.41	0.43	0.22
Age-standardized mortality rate sa[c]	0.19	0.20	0.17
Cumulative risk (%) at 75 years old[a]	0.02	0.02	0.02

Data accessed on 27 Jan 2021

For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

[a] Cumulative risk (mortality) is the probability or risk of individuals dying from the disease during ages 0-74 years. For cancer, it is expressed as the % of new born children who would be expected to die from a particular cancer before the age of 75 if they had the rates of cancer observed in the period in the absence of competing causes.

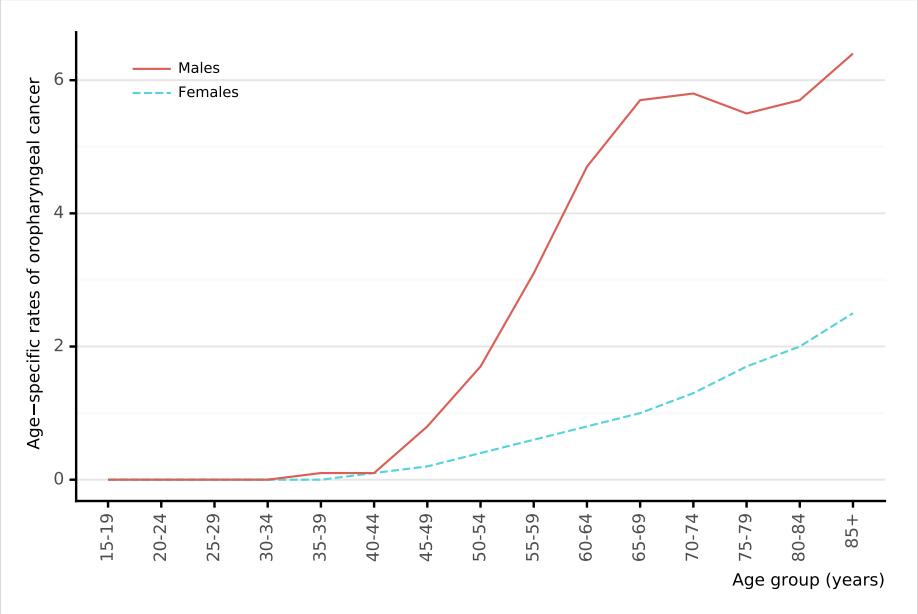
[b] Rates per 100,000 men per year.

[c] Rates per 100,000 women per year.

Data Sources:

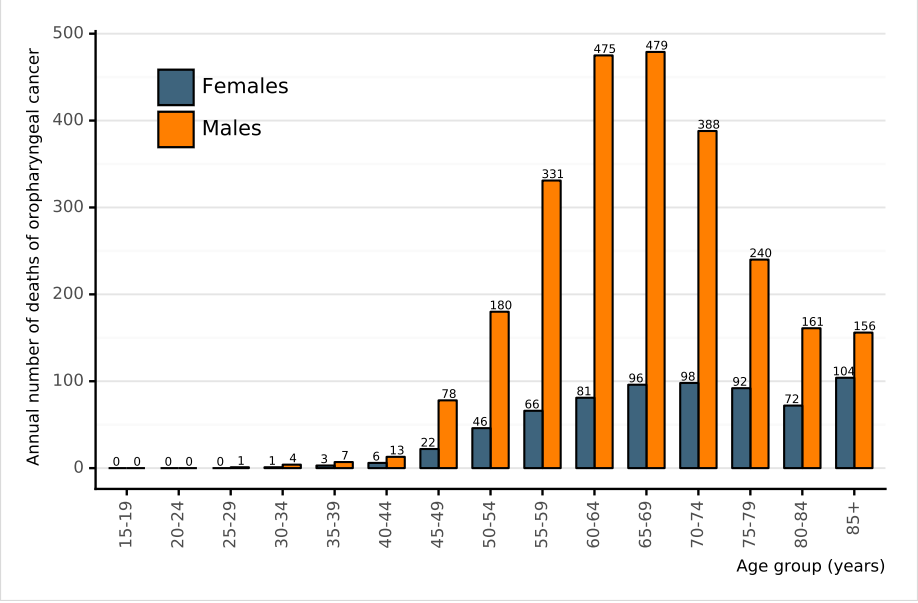
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 38: Age-specific mortality rates of oropharyngeal cancer in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Rates per 100,000 men per year.
[b] Rates per 100,000 women per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

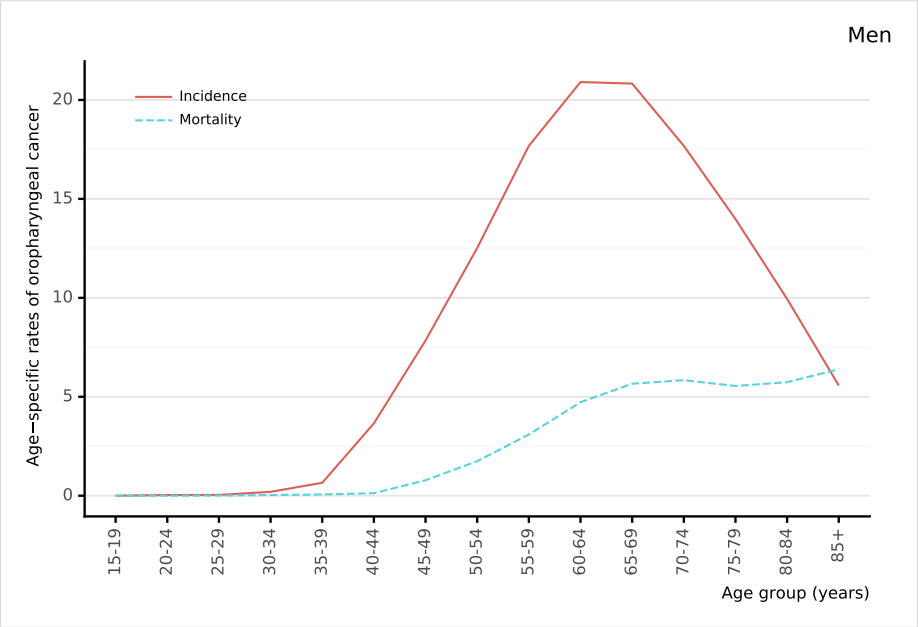
Figure 39: Annual number of deaths of oropharyngeal cancer in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

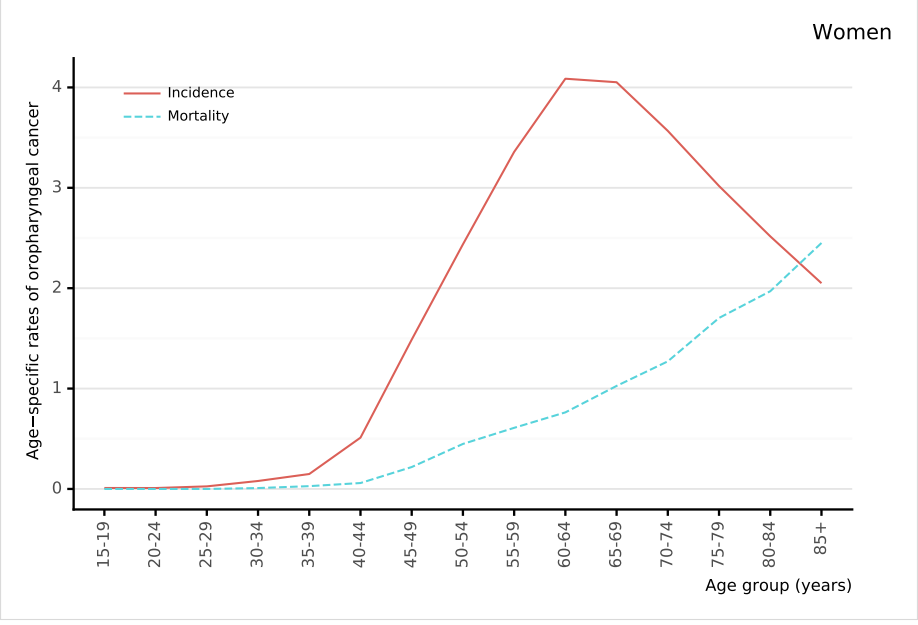
3.5.1.3 Oropharyngeal cancer incidence and mortality comparison in United States of America

Figure 40: Comparison of age-specific oropharyngeal cancer incidence and mortality rates among men in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Rates per 100,000 men per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 41: Comparison of age-specific oropharyngeal cancer incidence and mortality rates among women in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Rates per 100,000 women per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

3.5.2 Oral cavity cancer

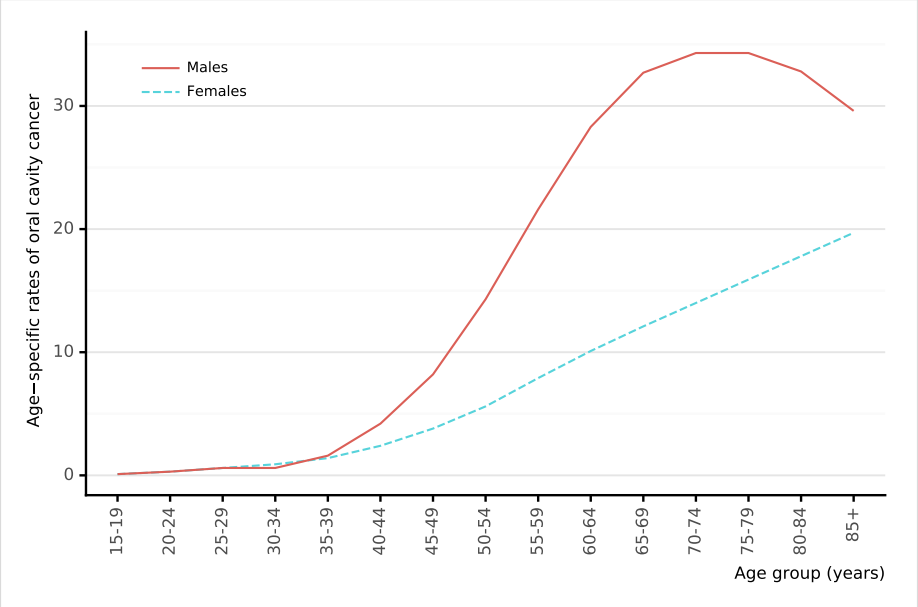
3.5.2.1 Oral cavity cancer incidence in United States of America

Table 17: Oral cavity cancer incidence in United States of America (estimates for 2020)

Indicator	United States of America	Northern America	World
MEN			
Annual number of new cancer cases	16,420	18,513	264,211
Uncertainty intervals of new cancer cases [95% UI]	[15,936-16,918]	[18,219-18,812]	[251,153-277,948]
Crude incidence rate sa[b]	10.0	10.1	6.72
Age-standardized incidence rate sa[b]	6.00	6.01	5.96
Cumulative risk (%) at 75 years old[a]	0.73	0.73	0.68
WOMEN			
Annual number of new cancer cases	8,050	8,956	113,502
Uncertainty intervals of new cancer cases [95% UI]	[7,633-8,490]	[8,751-9,166]	[105,599-121,997]
Crude incidence rate sa[c]	4.81	4.81	2.94
Age-standardized incidence rate sa[c]	2.59	2.56	2.28
Cumulative risk (%) at 75 years old[a]	0.30	0.29	0.26

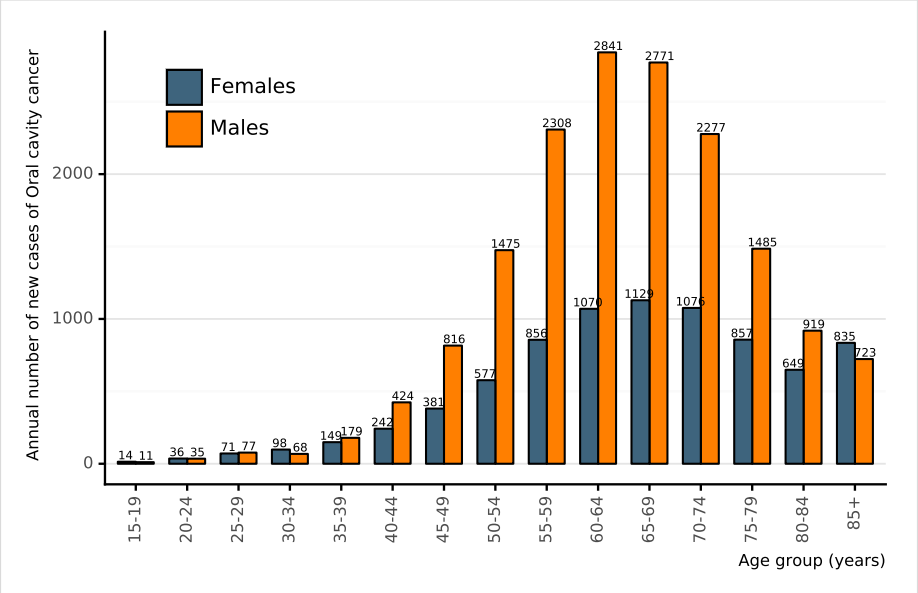
Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Cumulative risk (incidence) is the probability or risk of individuals getting from the disease during ages 0-74 years. For cancer, it is expressed as the % of new born children who would be expected to develop from a particular cancer before the age of 75 if they had the rates of cancer observed in the period in the absence of competing causes.
[b] Rates per 100,000 men per year.
[c] Rates per 100,000 women per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 42: Age-specific incidence rates of oral cavity cancer in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Rates per 100,000 men per year.
[b] Rates per 100,000 women per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 43: Annual number of new cases of oral cavity cancer in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

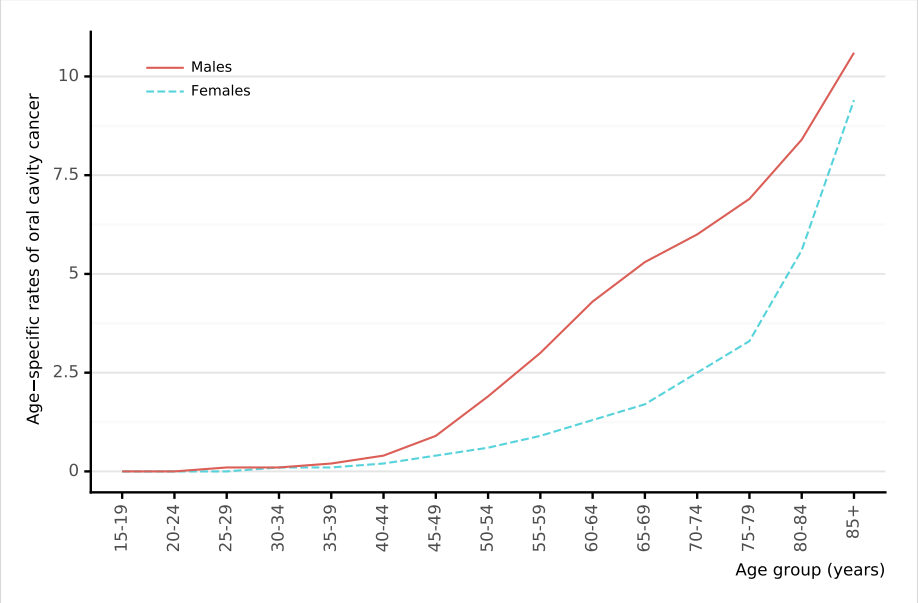
3.5.2.2 Oral cavity cancer incidence and mortality comparison in United States of America

Table 18: Oral cavity cancer mortality in United States of America (estimates for 2020)

Indicator	United States of America	Northern America	World
MEN			
Annual number of deaths	2,779	3,224	125,022
Uncertainty intervals of mortality cancer cases [95% UI]	[2,613-2,956]	[3,097-3,356]	[116,573-134,084]
Crude mortality rate sa[b]	1.70	1.77	3.18
Age-standardized mortality rate sa[b]	0.94	0.96	2.82
Cumulative risk (%) at 75 years old[a]	0.11	0.11	0.32
WOMEN			
Annual number of deaths	1,506	1,761	52,735
Uncertainty intervals of mortality cancer cases [95% UI]	[1,371-1,654]	[1,667-1,860]	[47,690-58,313]
Crude mortality rate sa[c]	0.90	0.95	1.36
Age-standardized mortality rate sa[c]	0.37	0.39	1.04
Cumulative risk (%) at 75 years old[a]	0.04	0.04	0.12

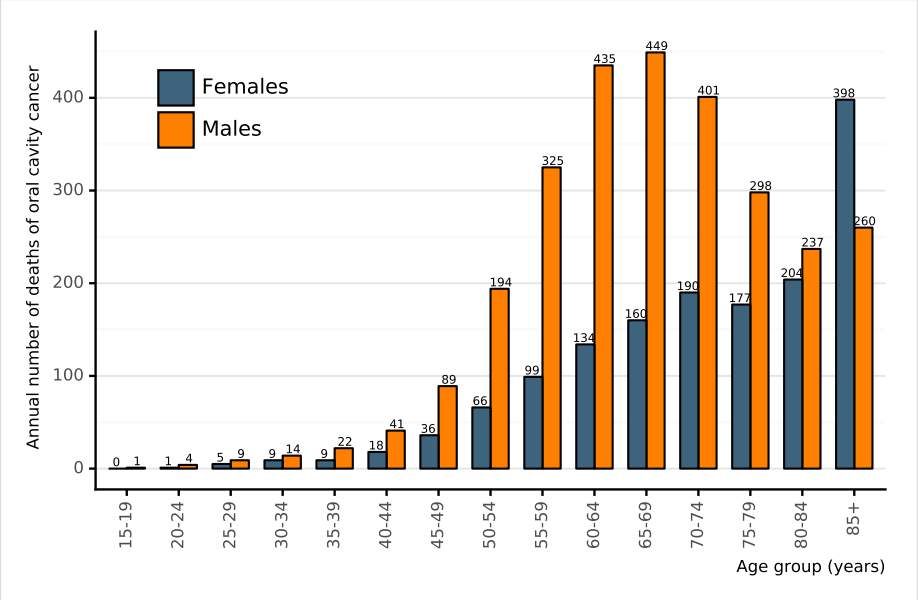
Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Cumulative risk (mortality) is the probability or risk of individuals dying from the disease during ages 0-74 years. For cancer, it is expressed as the % of new born children who would be expected to die from a particular cancer before the age of 75 if they had the rates of cancer observed in the period in the absence of competing causes.
[b] Rates per 100,000 men per year.
[c] Rates per 100,000 women per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 44: Age-specific mortality rates of oral cavity cancer in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Rates per 100,000 men per year.
[b] Rates per 100,000 women per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

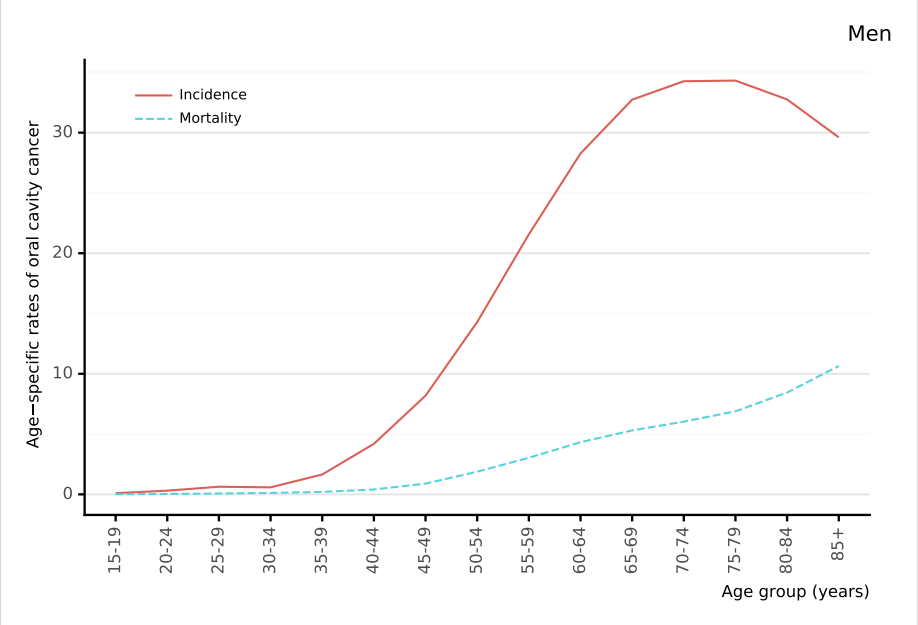
Figure 45: Annual number of deaths of oral cavity cancer in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

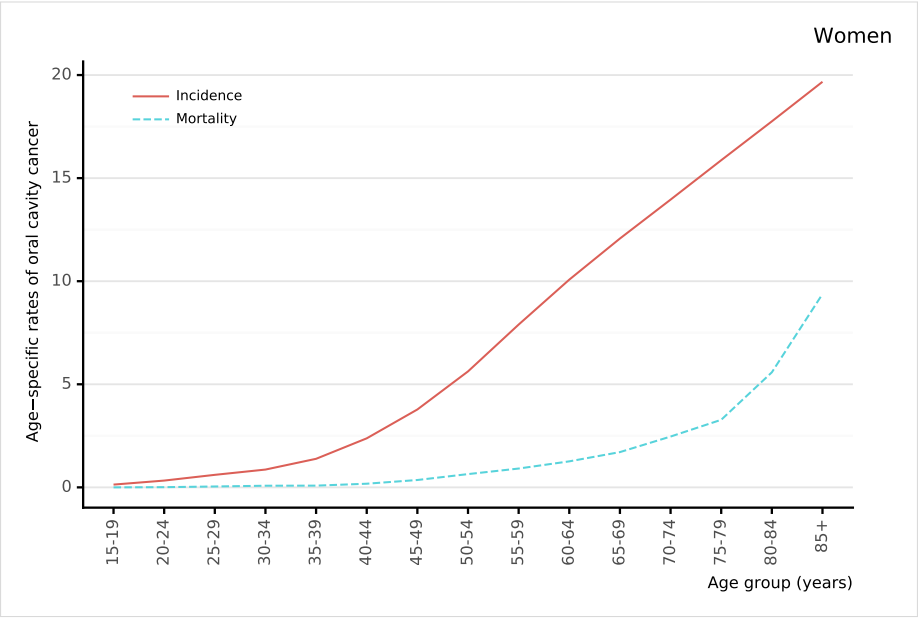
3.5.2.3 Oral cavity cancer incidence and mortality comparison in United States of America

Figure 46: Comparison of age-specific oral cavity cancer incidence and mortality rates among men in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Rates per 100,000 men per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 47: Comparison of age-specific oral cavity cancer incidence and mortality rates among women in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Rates per 100,000 women per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

3.5.3 Laryngeal cancer

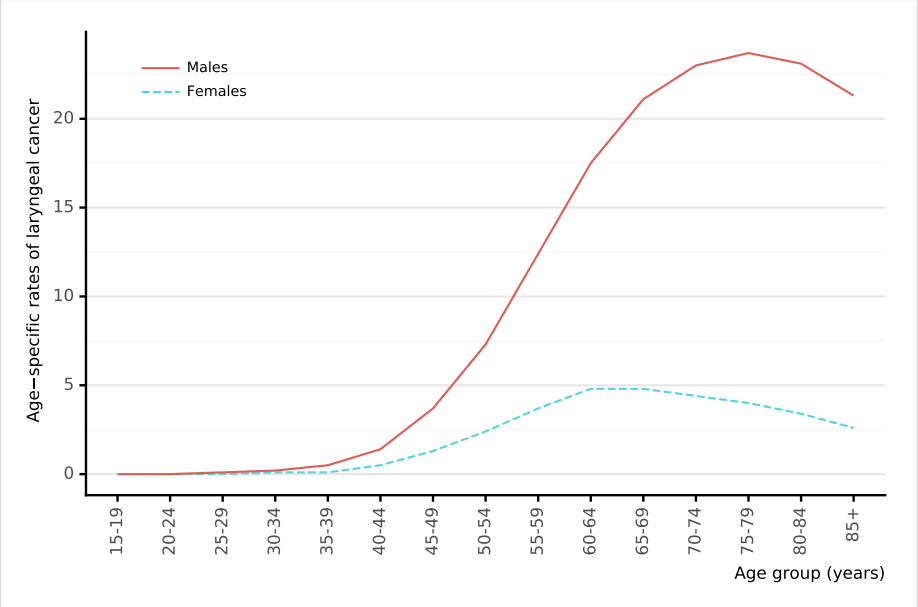
3.5.3.1 Laryngeal cancer incidence in United States of America

Table 19: Laryngeal cancer incidence in United States of America (estimates for 2020)

Indicator	United States of America	Northern America	World
MEN			
Annual number of new cancer cases	9,954	10,794	160,265
Uncertainty intervals of new cancer cases [95% UI]	[9,531-10,396]	[10,573-11,020]	[150,633-170,513]
Crude incidence rate sa[b]	6.08	5.91	4.08
Age-standardized incidence rate sa[b]	3.47	3.34	3.59
Cumulative risk (%) at 75 years old[a]	0.44	0.42	0.45
WOMEN			
Annual number of new cancer cases	2,600	2,751	24,350
Uncertainty intervals of new cancer cases [95% UI]	[2,391-2,827]	[2,640-2,866]	[20,845-28,444]
Crude incidence rate sa[c]	1.55	1.48	0.63
Age-standardized incidence rate sa[c]	0.88	0.83	0.49
Cumulative risk (%) at 75 years old[a]	0.11	0.10	0.06

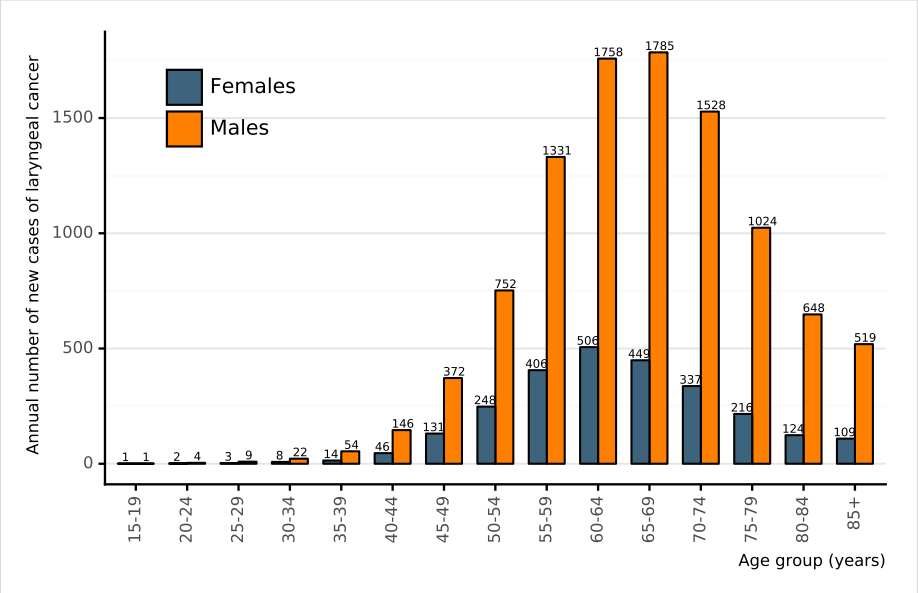
Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Cumulative risk (incidence) is the probability or risk of individuals getting from the disease during ages 0-74 years. For cancer, it is expressed as the % of new born children who would be expected to develop from a particular cancer before the age of 75 if they had the rates of cancer observed in the period in the absence of competing causes.
[b] Rates per 100,000 men per year.
[c] Rates per 100,000 women per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 48: Age-specific incidence rates of laryngeal cancer in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Rates per 100,000 men per year.
[b] Rates per 100,000 women per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 49: Annual number of new cases of laryngeal cancer in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

3.5.3.2 Laryngeal cancer incidence and mortality comparison in United States of America

Table 20: Laryngeal cancer mortality in United States of America (estimates for 2020)

Indicator	United States of America	Northern America	World
MEN			
Annual number of deaths	3,041	3,354	85,351
Uncertainty intervals of mortality cancer cases [95% UI]	[2,886-3,205]	[3,227-3,486]	[78,895-92,335]
Crude mortality rate sa[b]	1.86	1.84	2.17
Age-standardized mortality rate sa[b]	0.97	0.94	1.89
Cumulative risk (%) at 75 years old[a]	0.12	0.11	0.23
WOMEN			
Annual number of deaths	792	857	14,489
Uncertainty intervals of mortality cancer cases [95% UI]	[713-880]	[794-925]	[11,902-17,639]
Crude mortality rate sa[c]	0.47	0.46	0.37
Age-standardized mortality rate sa[c]	0.22	0.21	0.28
Cumulative risk (%) at 75 years old[a]	0.03	0.03	0.03

Data accessed on 27 Jan 2021

For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

[a] Cumulative risk (mortality) is the probability or risk of individuals dying from the disease during ages 0-74 years. For cancer, it is expressed as the % of new born children who would be expected to die from a particular cancer before the age of 75 if they had the rates of cancer observed in the period in the absence of competing causes.

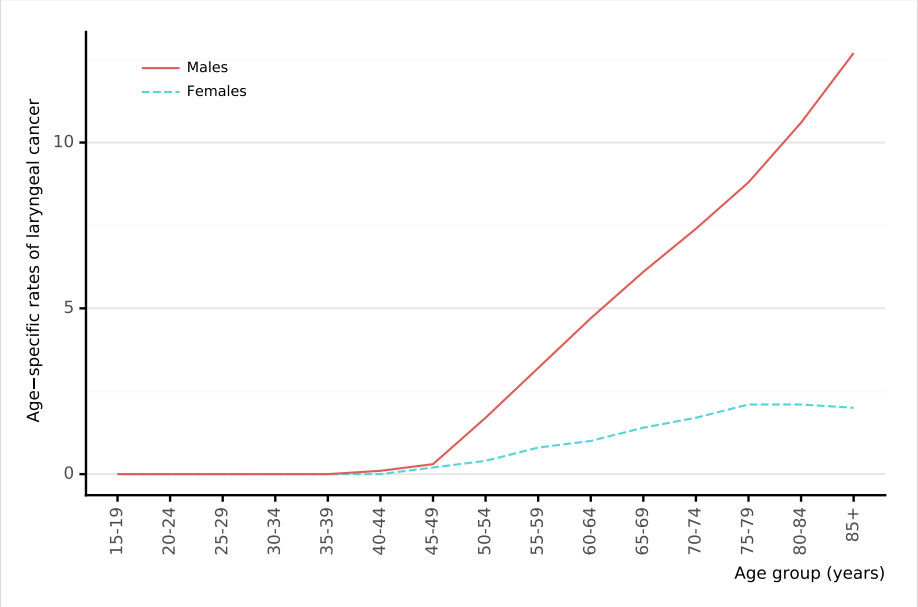
[b] Rates per 100,000 men per year.

[c] Rates per 100,000 women per year.

Data Sources:

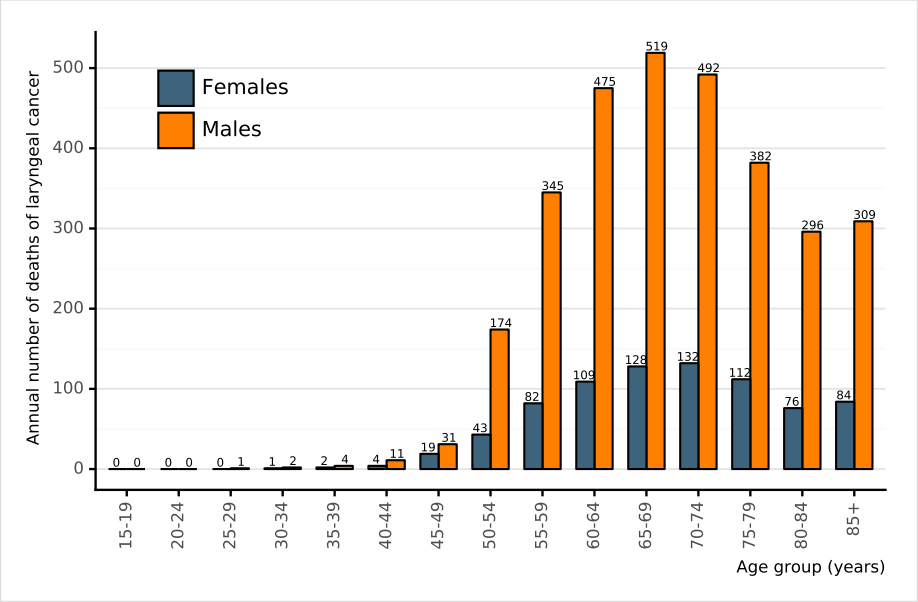
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 50: Age-specific mortality rates of laryngeal cancer in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Rates per 100,000 men per year.
[b] Rates per 100,000 women per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

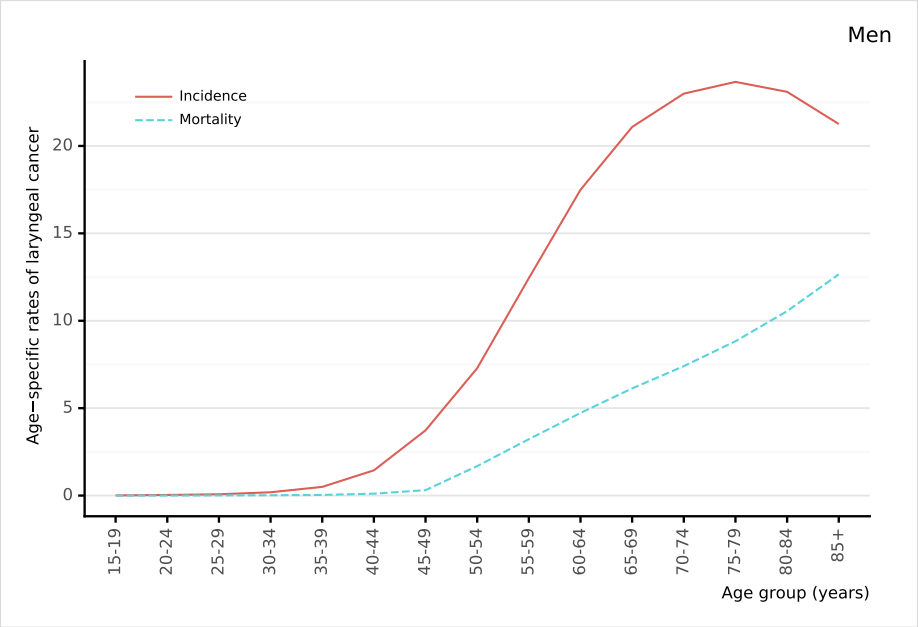
Figure 51: Annual number of deaths of of laryngeal cancer in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

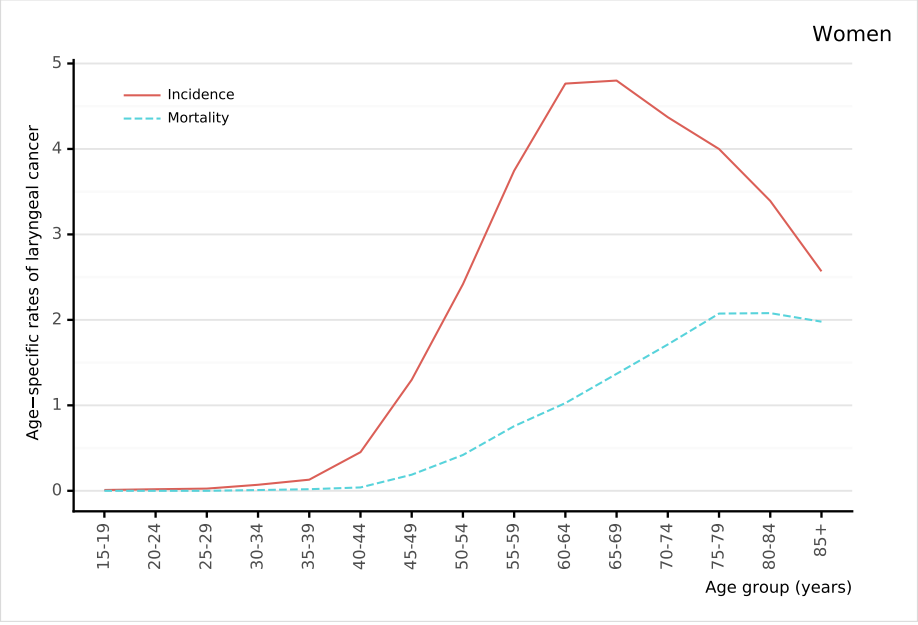
3.5.3.3 Laryngeal cancer incidence and mortality comparison in United States of America

Figure 52: Comparison of age-specific laryngeal cancer incidence and mortality rates among men in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Rates per 100,000 men per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 53: Comparison of age-specific laryngeal cancer incidence and mortality rates among women in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Rates per 100,000 women per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

4 HPV related statistics

HPV infection is commonly found in the anogenital tract of men and women with and without clinical lesions. The aetiological role of HPV infection among women with cervical cancer is well-established, and there is growing evidence of its central role in other anogenital sites. HPV is also responsible for other diseases such as recurrent juvenile respiratory papillomatosis and genital warts, both mainly caused by HPV types 6 and 11 (Lacey CJ, Vaccine 2006; 24(S3):35). For this section, the methodologies used to compile the information on HPV burden are derived from systematic reviews and meta-analyses of the literature. Due to the limitations of HPV DNA detection methods and study designs used, these data should be interpreted with caution and used only as a guide to assess the burden of HPV infection within the population. (Vaccine 2006, Vol. 24, Suppl 3; Vaccine 2008, Vol. 26, Suppl 10; Vaccine 2012,Vol. 30, Suppl 5; IARC Monographs 2007, Vol. 90).

4.1 HPV burden in women with normal cervical cytology, cervical precancerous lesions or invasive cervical cancer

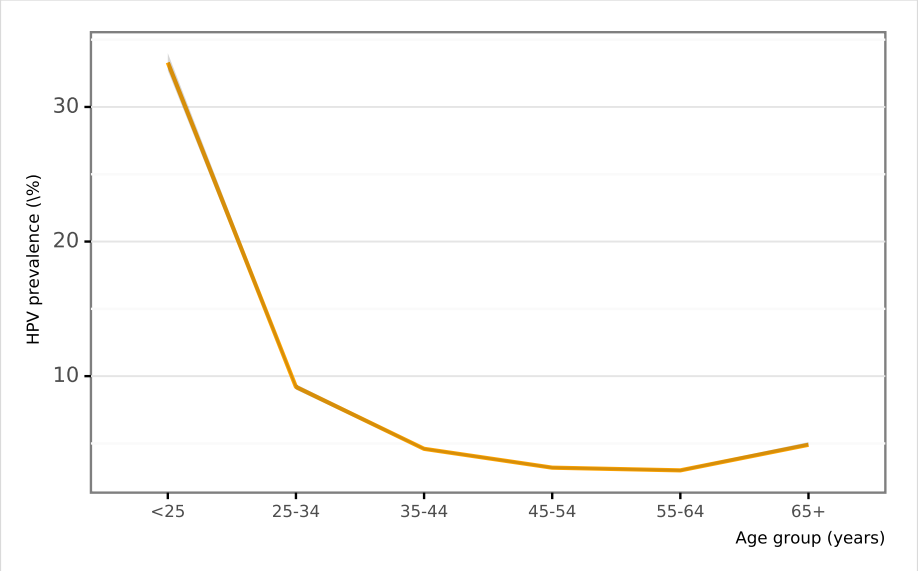
The statistics shown in this section focus on HPV infection in the cervix uteri. HPV cervical infection results in cervical morphological lesions ranging from normalcy (cytologically normal women) to different stages of precancerous lesions (CIN-1, CIN-2, CIN-3/CIS) and invasive cervical cancer. HPV infection is measured by HPV DNA detection in cervical cells (fresh tissue, paraffin embedded or exfoliated cells). The prevalence of HPV increases with lesion severity. HPV causes virtually 100% of cervical cancer cases, and an underestimation of HPV prevalence in cervical cancer is most likely due to the limitations of study methodologies. Worldwide, HPV16 and 18 (the two vaccine-preventable types) contribute to over 70% of all cervical cancer cases, between 41% and 67% of high-grade cervical lesions and 16-32% of low-grade cervical lesions. After HPV16/18, the six most common HPV types are the same in all world regions, namely 31, 33, 35, 45, 52 and 58; these account for an additional 20% of cervical cancers worldwide (Clifford G, Vaccine 2006;24(S3):26).

Methods: Prevalence and type distribution of human papillomavirus in cervical carcinoma, low-grade cervical lesions, high-grade cervical lesions and normal cytology: systematic review and meta-analysis

A systematic review of the literature was conducted regarding the worldwide HPV-prevalence and type distribution for cervical carcinoma, low-grade cervical lesions, high-grade cervical lesions and normal cytology from 1990 to 'data as of' indicated in each section. The search terms for the review were 'HPV' AND cerv* using Pubmed. There were no limits in publication language. References cited in selected articles were also investigated. Inclusion criteria were: HPV DNA detection by means of PCR or HC2, a minimum of 20 cases for cervical carcinoma, 20 cases for low-grade cervical lesions, 20 cases for highgrade cervical lesions and 100 cases for normal cytology and a detailed description of HPV DNA detection and genotyping techniques used. The number of cases tested and HPV positive extracted for each study were pooled to estimate the prevalence of HPV DNA and the HPV type distribution globally and by geographical region. Binomial 95% confidence intervals were calculated for each HPV prevalence. For more details refer to the methods document.

4.1.1 HPV prevalence in women with normal cervical cytology

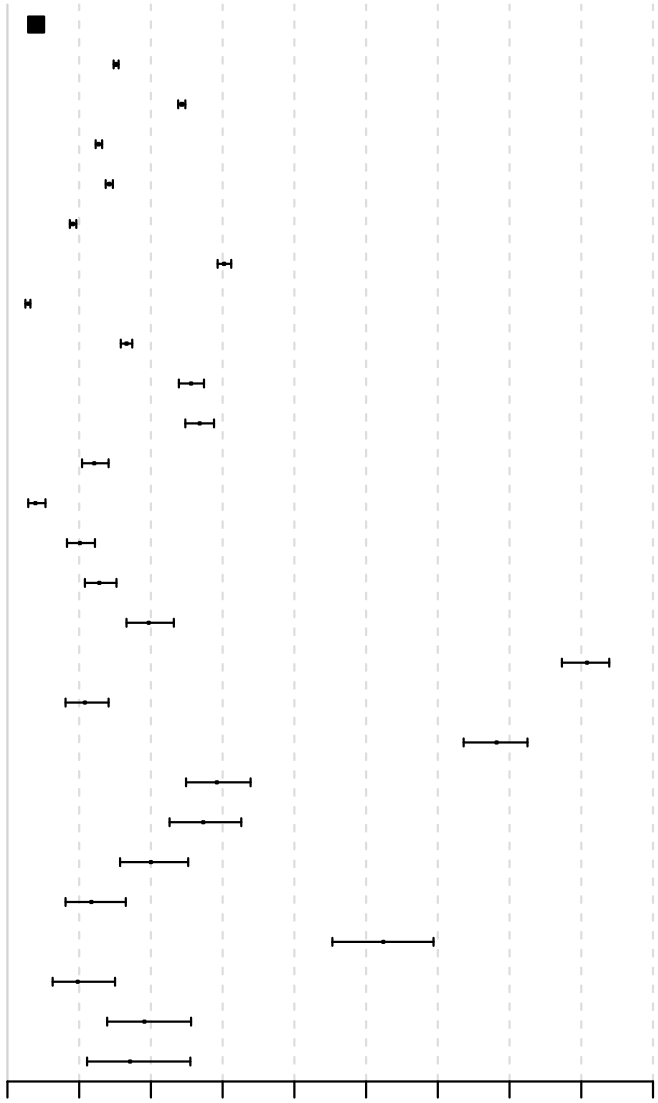
Figure 54: Crude age-specific HPV prevalence (%) and 95% confidence interval in women with normal cervical cytology in United States of America



Data updated on 30 Jun 2015 (data as of 30 Jun 2014)

Data Sources:
Castle PE, Obstet Gynecol 2009; 113: 595 | Cibas ES, Gynecol Oncol 2007; 104: 702 | Datta SD, Ann Intern Med 2008; 148: 493 | Evans MF, Cancer 2006; 106: 1054 | Hernandez BY, Nutr Cancer 2004; 49: 109 | Schiffman M, Cancer Epidemiol Biomarkers Prev 2011; 20: 1398 | Smith EM, Int J Gynaecol Obstet 2004; 87: 131 | Swan DC, J Clin Microbiol 1999; 37: 1030 | Wheeler CM, Int J Cancer 2013; 132: 198 | Wideroff L, Nutr Cancer 1998; 30: 130 | Zhao C, Cancer 2007; 111: 292
Based on systematic reviews and meta-analysis performed by ICO. The ICO HPV Information Centre has updated data until June 2014. Reference publications: 1) Bruni L, J Infect Dis 2010; 202: 1789. 2) De Sanjosé S, Lancet Infect Dis 2007; 7: 453

Figure 55: HPV prevalence among women with normal cervical cytology in United States of America, by study



Castle 2009 (Northern California)	30−90	580289	4.0 (3.9−4.0)
Castle 2011 (23 US States)	25−42	38403	15.1 (14.8−15.5)
Wheeler 2013 (New Mexico)	−	33614	24.3 (23.8−24.8)
Sherman 2003 (Portland)	16−94	20156	12.7 (12.3−13.2)
Castle 2012 (Portland)[b]	16−94	19512	14.2 (13.7−14.7)
Schiffman 2011 (Portland)	16−94	18450	9.1 (8.7−9.6)
Dunne 2013[d]	11−29	9231	30.2 (29.3−31.2)
Zhao 2007 (Pittsburgh)	11−90	8070	2.9 (2.5−3.2)
Datta 2008[c]	18−65	8055	16.6 (15.8−17.4)
Goodman 2008 (Hawaii)	18−85	2356	25.6 (23.9−27.4)
Dunne 2007[b]	14−59	1921	26.8 (24.8−28.8)
Insinga 2007	16−23	1203	12.1 (10.4−14.1)
Cibas 2007 (Boston)	30−45	1000	3.9 (2.9−5.3)
Giuliano 1999 (Tucson)	18−47	911	10.1 (8.3−12.2)
Giuliano 2001 (Arizona)	15−79	881	12.8 (10.8−15.2)
Winer 2003 (Seattle)[b]	18−20	553	19.7 (16.6−23.2)
Moscicki 2001 (San Francisco)	13−24	547	80.8 (77.3−83.9)
Khanna 2007 (Baltimore)	18−69	418	10.8 (8.1−14.1)
Kahn 2008 (Cincinnati)[b]	13−26	409	68.2 (63.6−72.5)
Kotloff 1998 (Maryland)	17−44	390	29.2 (24.9−33.9)
Evans 2006 (Vermont)	16−69	300	27.3 (22.6−32.6)
Swan 1999 (Texas)	18−45	270	20.0 (15.7−25.2)
Smith 2003 (Iowa)	42−85	223	11.7 (8.1−16.5)
Tarkowski 2004 (Atlanta)	12−20	189	52.4 (45.3−59.4)
Hernandez 2004 (Hawaii)	>=18	183	9.8 (6.3−15.0)
Chaturvedi 2005 (New Orleans)	18−70	173	19.1 (13.9−25.6)
Smith 2004 (Iowa)	45−64	105	17.1 (11.1−25.5)

Data updated on 30 Jun 2015 (data as of 30 Jun 2014)

The samples for HPV testing come from cervical specimens (fresh/fixed biopsies or exfoliated cells)
[a] Number of women tested
[b] Women from the general population, including some with cytological cervical abnormalities
[c] Boston, Baltimore, New Orleans, Denver, Seattle, Los Angeles
[d] San Francisco Bay, Sacramento, Central Valley, Northwest Oregon and Southwest Washington Areas

Data Sources:
Castle PE, J Clin Oncol 2012; 30: 3044 | Castle PE, Lancet Oncol 2011; 12: 880 | Castle PE, Obstet Gynecol 2009; 113: 595 | Chaturvedi AK, J Med Virol 2005; 75: 105 | Cibas ES, Gynecol Oncol 2007; 104: 702 | Datta SD, Ann Intern Med 2008; 148: 493 | Dunne EF, Cancer Causes Control 2013; 24: 403 | Dunne EF, JAMA 2007; 297: 813 | Evans MF, Cancer 2006; 106: 1054 | Giuliano AR, Cancer Epidemiol Biomarkers Prev 1999; 8: 615 | Giuliano AR, Cancer Epidemiol Biomarkers Prev 2001; 10: 1129 | Goodman MT, Cancer Res 2008; 68: 8813 | Hernandez BY, Nutr Cancer 2004; 49: 109 | Insinga RP, Cancer Epidemiol Biomarkers Prev 2007; 16: 709 | Kahn JA, Obstet Gynecol 2008; 111: 1103 | Khanna N, Int J Gynecol Cancer 2007; 17: 615 | Kotloff KL, Sex Transm Dis 1998; 25: 243 | Moscicki AB, JAMA 2001; 285: 2995 | Schiffman M, Cancer Epidemiol Biomarkers Prev 2011; 20: 1398 | Sherman ME, J Natl Cancer Inst 2003; 95: 46 | Smith EM, Cancer Detect Prev 2003; 27: 472 | Smith EM, Int J Gynaecol Obstet 2004; 87: 131 | Swan DC, J Clin Microbiol 1999; 37: 1030 | Tarkowski TA, J Infect Dis 2004; 189: 46 | Wheeler CM, Int J Cancer 2013; 132: 198 | Winer RL, Am J Epidemiol 2003; 157: 218 | Zhao C, Cancer 2007; 111: 292
Based on systematic reviews and meta-analysis performed by ICO. The ICO HPV Information Centre has updated data until June 2014. Reference publications: 1) Bruni L, J Infect Dis 2010; 202: 1789. 2) De Sanjosé S, Lancet Infect Dis 2007; 7: 453

4.1.2 HPV type distribution among women with normal cervical cytology, precancerous cervical lesions and cervical cancer

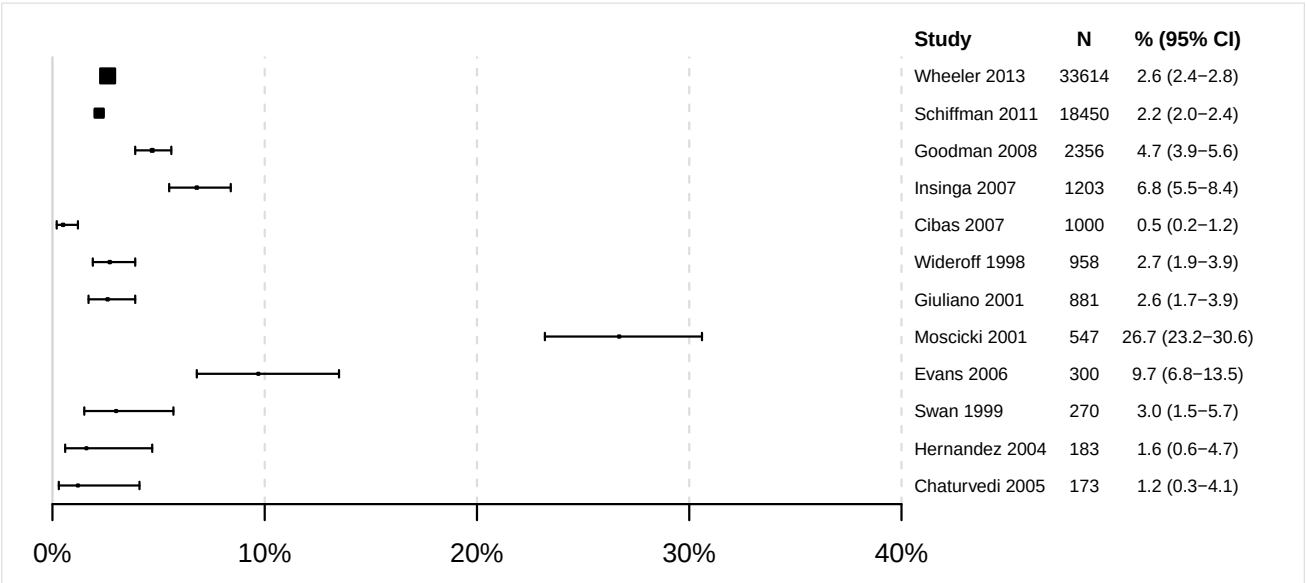
Table 21: Prevalence of HPV16 and HPV18 by cytology in United States of America

	No. tested	HPV 16/18 Prevalence % (95% CI)
Normal cytology[1,2]	59935	3.9 (3.7-4.1)
Low-grade lesions[3,4]	4327	24.7 (23.4-26.0)
High-grade lesions[5,6]	9476	57.9 (56.9-58.9)
Cervical cancer[7,8]	3506	71.2 (69.7-72.7)

Data updated on 19 May 2017 (data as of 30 Jun 2015 / 30 Nov 2014)

The samples for HPV testing come from cervical specimens (fresh/fixed biopsies or exfoliated cells)
[a] Number of women tested
[b] 95% Confidence Interval
Data Sources:
[1] Chaturvedi AK, J Med Virol 2005; 75: 105 | Cibas ES, Gynecol Oncol 2007; 104: 702 | Dunne EF, Cancer Causes Control 2013; 24: 403 | Evans MF, Cancer 2006; 106: 1054 | Giuliano AR, Cancer Epidemiol Biomarkers Prev 2001; 10: 1129 | Goodman MT, Cancer Res 2008; 68: 8813 | Hernandez BY, Nutr Cancer 2004; 49: 109 | Insinga RP, Cancer Epidemiol Biomarkers Prev 2007; 16: 709 | Moscicki AB, JAMA 2001; 285: 2995 | Schiffman M, Cancer Epidemiol Biomarkers Prev 2011; 20: 1398 | Swan DC, J Clin Microbiol 1999; 37: 1030 | Wheeler CM, Int J Cancer 2013; 132: 198 | Wideroff L, Nutr Cancer 1998; 30: 130
[2] Based on systematic reviews and meta-analysis performed by ICO. The ICO HPV Information Centre has updated data until November 2014. Reference publications: 1) Bruni L, J Infect Dis 2010; 202: 1789. 2) De Sanjosé S, Lancet Infect Dis 2007; 7: 453
[3] Contributing studies: Adam E, Am J Obstet Gynecol 2000; 182: 257 | Bell MC, Gynecol Oncol 2007; 107: 236 | Brown DR, Sex Transm Dis 2002; 29: 763 | Castle PE, Cancer Epidemiol Biomarkers Prev 2011; 20: 946 | Einstein MH, Int J Cancer 2007; 120: 55 | Evans MF, Cancer 2006; 106: 1054 | Evans MF, Mod Pathol 2002; 15: 1339 | Giuliano AR, Cancer Epidemiol Biomarkers Prev 2001; 10: 1129 | Guo M, Mod Pathol 2007; 20: 256 | Hu L, Mod Pathol 2005; 18: 267 | Jarboe EA, Hum Pathol 2004; 35: 396 | Kong CS, Am J Surg Pathol 2007; 31: 33 | Kulasingam SL, JAMA 2002; 288: 1749 | Lee SH, Int J Gynaecol Obstet 2009; 105: 210 | Liaw KL, J Natl Cancer Inst 1999; 91: 954 | Moscicki AB, Obstet Gynecol 2008; 112: 1335 | Park K, Int J Gynecol Pathol 2007; 26: 457 | Schiff M, Am J Epidemiol 2000; 152: 716 | Stoler MH, Am J Clin Pathol 2011; 135: 468 | Swan DC, J Clin Microbiol 1999; 37: 1030 | Tortolero-Luna G, Cad Saude Publica 1998; 14 Suppl 3: 149 | Vidal AC, Cancer Causes Control 2014; 25: 1055 | Voss JS, Anal Quant Cytol Histol 2009; 31: 208 | Wentzensen N, Int J Cancer 2009; 124: 964 | Wheeler CM, J Infect Dis 2006; 194: 1291 | Wheeler CM, J Natl Cancer Inst 2009; 101: 475 | Zuna RE, Mod Pathol 2007; 20: 167
[4] Based on meta-analysis performed by IARC's Infections and Cancer Epidemiology Group up to November 2011, the ICO HPV Information Centre has updated data until June 2015. Reference publications: 1) Guan P, Int J Cancer 2012;131:2349 2) Clifford GM, Cancer Epidemiol Biomarkers Prev 2005;14:1157
[5] Contributing studies: Adam E, Am J Obstet Gynecol 1998; 178: 1235 | Bell MC, Gynecol Oncol 2007; 107: 236 | Castle PE, Cancer Epidemiol Biomarkers Prev 2010; 19: 1675 | Castle PE, Cancer Epidemiol Biomarkers Prev 2011; 20: 946 | Einstein MH, Int J Cancer 2007; 120: 55 | Evans MF, Cancer 2006; 106: 1054 | Evans MF, Eur J Gynaecol Oncol 2003; 24: 373 | Giuliano AR, Cancer Epidemiol Biomarkers Prev 2001; 10: 1129 | Guo M, Mod Pathol 2007; 20: 256 | Hariri S, J Infect Dis 2012; 206: 1878 | Hariri S, PLoS ONE 2012; 7: e34044 | Hu L, Mod Pathol 2005; 18: 267 | Joste NE, Cancer Epidemiol Biomarkers Prev 2015; 24: 230 | Kong CS, Am J Surg Pathol 2007; 31: 33 | Lee SH, Int J Gynaecol Obstet 2009; 105: 210 | Moscicki AB, Obstet Gynecol 2008; 112: 1335 | Stoler MH, Am J Clin Pathol 2011; 135: 468 | Vidal AC, Cancer Causes Control 2014; 25: 1055 | Voss JS, Anal Quant Cytol Histol 2009; 31: 208 | Wentzensen N, Int J Cancer 2009; 124: 964 | Wheeler CM, J Infect Dis 2006; 194: 1291 | Wheeler CM, J Natl Cancer Inst 2009; 101: 475 | Zuna RE, Mod Pathol 2007; 20: 167
[6] Based on meta-analysis performed by IARC's Infections and Cancer Epidemiology Group up to November 2011, the ICO HPV Information Centre has updated data until June 2015. Reference publications: 1) Guan P, Int J Cancer 2012;131:2349 2) Smith JS, Int J Cancer 2007;121:621 3) Clifford GM, Br J Cancer 2003;89:101.
[7] Contributing studies: Bosch FX, J Natl Cancer Inst 1995; 87: 796 | Bryan JT, J Med Virol 2006; 78: 117 | Burger RA, J Natl Cancer Inst 1996; 88: 1361 | Burnett AF, Gynecol Oncol 1992; 47: 343 | de Sanjose S, Lancet Oncol 2010; 11: 1048 | Ferguson AW, Mod Pathol 1998; 11: 11 | Guo M, Mod Pathol 2007; 20: 256 | Hariri S, PLoS ONE 2012; 7: e34044 | Hopenhayn C, J Low Genit Tract Dis 2014; 18: 182 | Joste NE, Cancer Epidemiol Biomarkers Prev 2015; 24: 230 | Paquette RL, Cancer 1993; 72: 1272 | Patel DA, J Virol Methods 2009; 160: 78 | Pirog EC, Am J Pathol 2000; 157: 1055 | Quint KD, Gynecol Oncol 2009; 114: 390 | Resnick RM, J Natl Cancer Inst 1990; 82: 1477 | Schwartz SM, J Clin Oncol 2001; 19: 1906 | Sebbelov AM, Microbes Infect 2000; 2: 121 | Wentzensen N, Int J Cancer 2009; 124: 964 | Wheeler CM, J Natl Cancer Inst 2009; 101: 475 | Wistuba II, Cancer Res 1997; 57: 3154 | Zuna RE, Mod Pathol 2007; 20: 167
[8] Based on meta-analysis performed by IARC's Infections and Cancer Epidemiology Group up to November 2011, the ICO HPV Information Centre has updated data until June 2015. Reference publications: 1) Guan P, Int J Cancer 2012;131:2349 2) Li N, Int J Cancer 2011;128:927 3) Smith JS, Int J Cancer 2007;121:621 4) Clifford GM, Br J Cancer 2003;88:63 5) Clifford GM, Br J Cancer 2003;89:101.

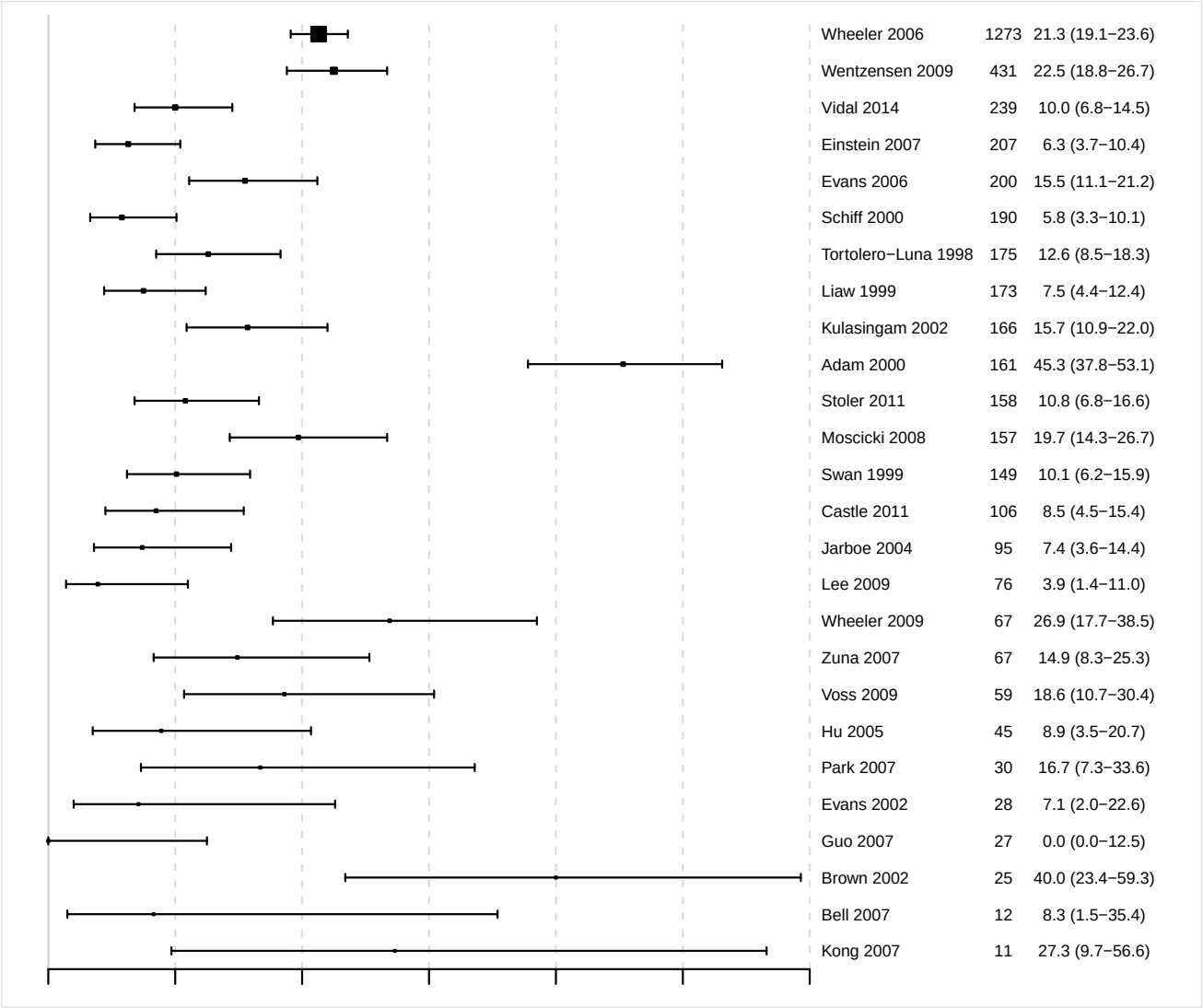
Figure 56: HPV 16 prevalence among women with normal cervical cytology in United States of America, by study



Data updated on 30 Jun 2015 (data as of 30 Jun 2014)

The samples for HPV testing come from cervical specimens (fresh/fixed biopsies or exfoliated cells)
[a] Number of women tested
Data Sources:
Chaturvedi AK, J Med Virol 2005; 75: 105 | Cibas ES, Gynecol Oncol 2007; 104: 702 | Evans MF, Cancer 2006; 106: 1054 | Giuliano AR, Cancer Epidemiol Biomarkers Prev 2001; 10: 1129 | Goodman MT, Cancer Res 2008; 68: 8813 | Hernandez BY, Nutr Cancer 2004; 49: 109 | Insinga RP, Cancer Epidemiol Biomarkers Prev 2007; 16: 709 | Moscicki AB, JAMA 2001; 285: 2995 | Schiffman M, Cancer Epidemiol Biomarkers Prev 2011; 20: 1398 | Swan DC, J Clin Microbiol 1999; 37: 1030 | Wheeler CM, Int J Cancer 2013; 132: 198 | Wideroff L, Nutr Cancer 1998; 30: 130
Based on systematic reviews and meta-analysis performed by ICO. The ICO HPV Information Centre has updated data until June 2014. Reference publications: 1) Bruni L, J Infect Dis 2010; 202: 1789. 2) De Sanjosé S, Lancet Infect Dis 2007; 7: 453

Figure 57: HPV 16 prevalence among women with low-grade cervical lesions in United States of America, by study

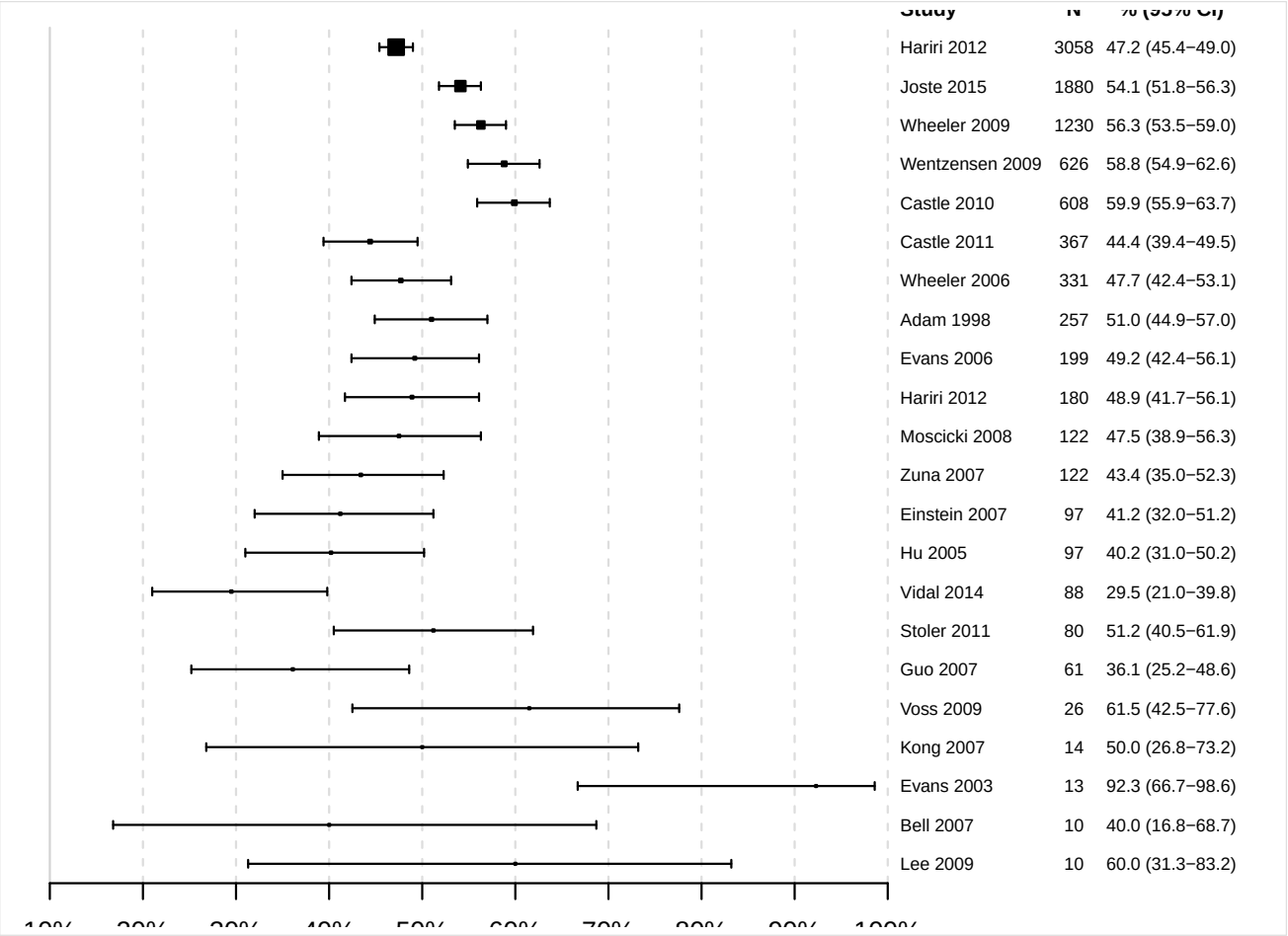


Data updated on 27 Jan 2017 (data as of 30 Jun 2015)

The samples for HPV testing come from cervical specimens (fresh/fixed biopsies or exfoliated cells)
[a] Number of women tested

Data Sources:
Adam E, Am J Obstet Gynecol 2000; 182: 257 | Bell MC, Gynecol Oncol 2007; 107: 236 | Brown DR, Sex Transm Dis 2002; 29: 763 | Castle PE, Cancer Epidemiol Biomarkers Prev 2011; 20: 946 | Einstein MH, Int J Cancer 2007; 120: 55 | Evans MF, Cancer 2006; 106: 1054 | Evans MF, Mod Pathol 2002; 15: 1339 | Giuliano AR, Cancer Epidemiol Biomarkers Prev 2001; 10: 1129 | Guo M, Mod Pathol 2007; 20: 256 | Hu L, Mod Pathol 2005; 18: 267 | Jarboe EA, Hum Pathol 2004; 35: 396 | Kong CS, Am J Surg Pathol 2007; 31: 33 | Kulasingam SL, JAMA 2002; 288: 1749 | Lee SH, Int J Gynaecol Obstet 2009; 105: 210 | Liaw KL, J Natl Cancer Inst 1999; 91: 954 | Moscicki AB, Obstet Gynecol 2008; 112: 1335 | Park K, Int J Gynecol Pathol 2007; 26: 457 | Schiff M, Am J Epidemiol 2000; 152: 716 | Stoler MH, Am J Clin Pathol 2011; 135: 468 | Swan DC, J Clin Microbiol 1999; 37: 1030 | Tortolero-Luna G, Cad Saude Publica 1998; 14 Suppl 3: 149 | Vidal AC, Cancer Causes Control 2014; 25: 1055 | Voss JS, Anal Quant Cytol Histol 2009; 31: 208 | Wentzensen N, Int J Cancer 2009; 124: 964 | Wheeler CM, J Infect Dis 2006; 194: 1291 | Wheeler CM, J Natl Cancer Inst 2009; 101: 475 | Zuna RE, Mod Pathol 2007; 20: 167
Based on meta-analysis performed by IARC's Infections and Cancer Epidemiology Group up to November 2011, the ICO HPV Information Centre has updated data until June 2015. Reference publications: 1) Guan P, Int J Cancer 2012;131:2349 2) Clifford GM, Cancer Epidemiol Biomarkers Prev 2005;14:1157

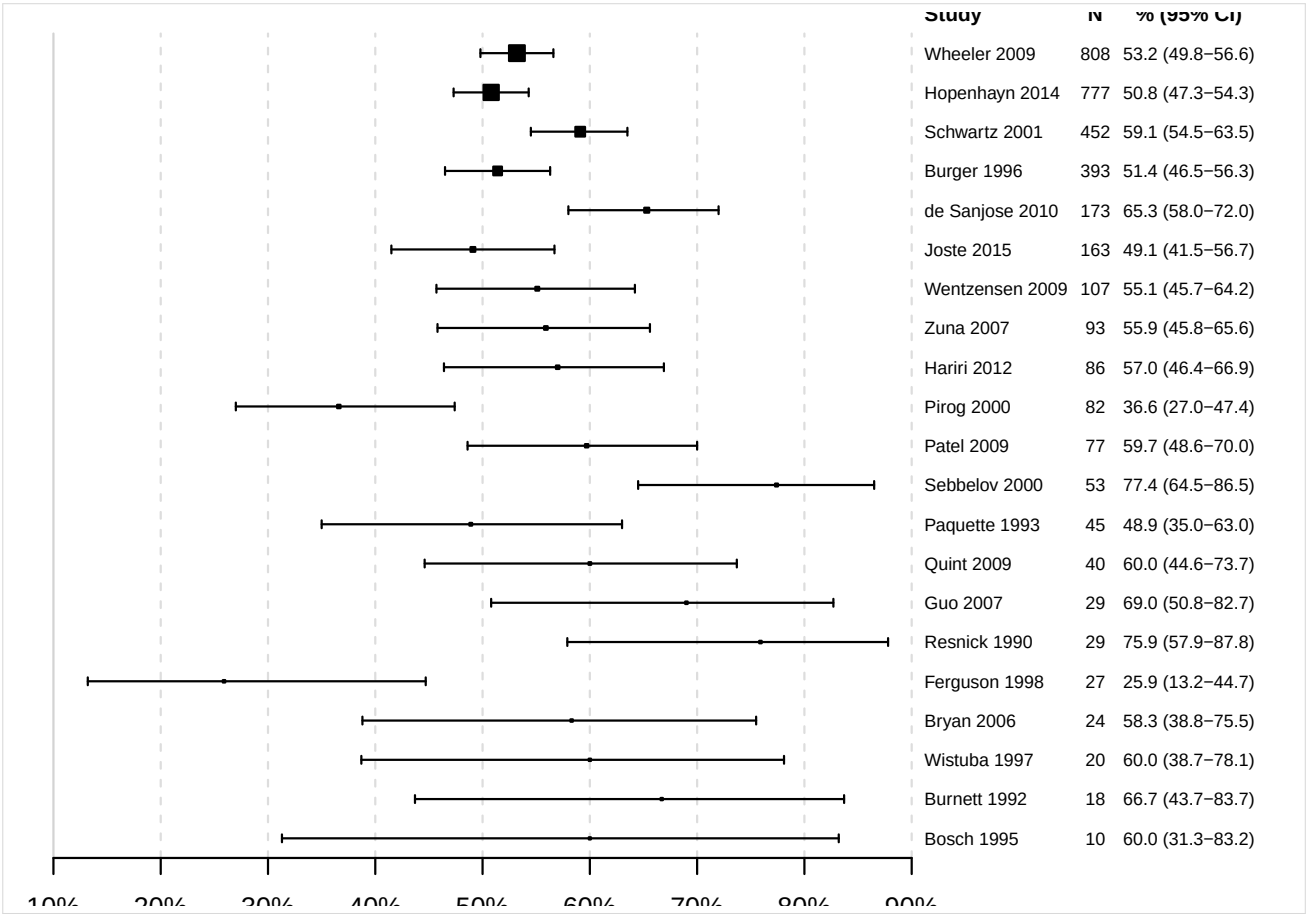
Figure 58: HPV 16 prevalence among women with high-grade cervical lesions in United States of America, by study



Data updated on 27 Jan 2017 (data as of 30 Jun 2015)

The samples for HPV testing come from cervical specimens (fresh/fixed biopsies or exfoliated cells)
[a] Number of women tested
Data Sources:
Adam E, Am J Obstet Gynecol 1998; 178: 1235 | Bell MC, Gynecol Oncol 2007; 107: 236 | Castle PE, Cancer Epidemiol Biomarkers Prev 2010; 19: 1675 | Castle PE, Cancer Epidemiol Biomarkers Prev 2011; 20: 946 | Einstein MH, Int J Cancer 2007; 120: 55 | Evans MF, Cancer 2006; 106: 1054 | Evans MF, Eur J Gynaecol Oncol 2003; 24: 373 | Giuliano AR, Cancer Epidemiol Biomarkers Prev 2001; 10: 1129 | Guo M, Mod Pathol 2007; 20: 256 | Hariri S, J Infect Dis 2012; 206: 1878 | Hariri S, PLoS ONE 2012; 7: e34044 | Hu L, Mod Pathol 2005; 18: 267 | Joste NE, Cancer Epidemiol Biomarkers Prev 2015; 24: 230 | Kong CS, Am J Surg Pathol 2007; 31: 33 | Lee SH, Int J Gynaecol Obstet 2009; 105: 210 | Moscicki AB, Obstet Gynecol 2008; 112: 1335 | Stoler MH, Am J Clin Pathol 2011; 135: 468 | Vidal AC, Cancer Causes Control 2014; 25: 1055 | Voss JS, Anal Quant Cytol Histol 2009; 31: 208 | Wentzensen N, Int J Cancer 2009; 124: 964 | Wheeler CM, J Infect Dis 2006; 194: 1291 | Wheeler CM, J Natl Cancer Inst 2009; 101: 475 | Zuna RE, Mod Pathol 2007; 20: 167
Based on meta-analysis performed by IARC's Infections and Cancer Epidemiology Group up to November 2011, the ICO HPV Information Centre has updated data until June 2015. Reference publications: 1) Guan P, Int J Cancer 2012;131:2349 2) Smith JS, Int J Cancer 2007;121:621 3) Clifford GM, Br J Cancer 2003;89:101.

Figure 59: HPV 16 prevalence among women with invasive cervical cancer in United States of America, by study



Data updated on 19 May 2017 (data as of 30 Jun 2015)

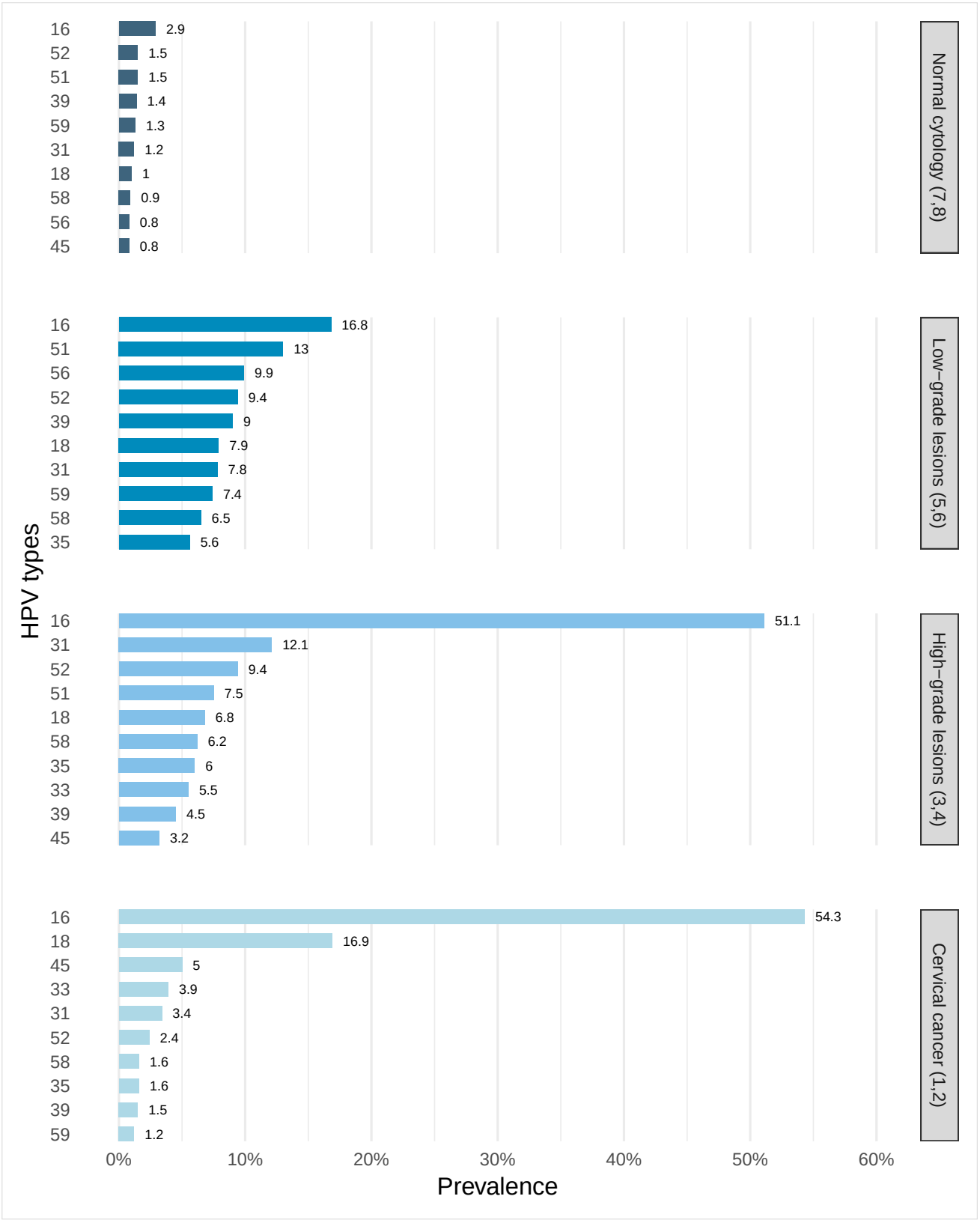
The samples for HPV testing come from cervical specimens (fresh/fixed biopsies or exfoliated cells)
[a] Number of women tested

Data Sources:

Bosch FX, J Natl Cancer Inst 1995; 87: 796 | Bryan JT, J Med Virol 2006; 78: 117 | Burger RA, J Natl Cancer Inst 1996; 88: 1361 | Burnett AF, Gynecol Oncol 1992; 47: 343 | de Sanjose S, Lancet Oncol 2010; 11: 1048 | Ferguson AW, Mod Pathol 1998; 11: 11 | Guo M, Mod Pathol 2007; 20: 256 | Hariri S, PLoS ONE 2012; 7: e34044 | Hopenhayn C, J Low Genit Tract Dis 2014; 18: 182 | Joste NE, Cancer Epidemiol Biomarkers Prev 2015; 24: 230 | Paquette RL, Cancer 1993; 72: 1272 | Patel DA, J Virol Methods 2009; 160: 78 | Pirog EC, Am J Pathol 2000; 157: 1055 | Quint KD, Gynecol Oncol 2009; 114: 390 | Resnick RM, J Natl Cancer Inst 1990; 82: 1477 | Schwartz SM, J Clin Oncol 2001; 19: 1906 | Sebbelov AM, Microbes Infect 2000; 2: 121 | Wentzensen N, Int J Cancer 2009; 124: 964 | Wheeler CM, J Natl Cancer Inst 2009; 101: 475 | Wistuba II, Cancer Res 1997; 57: 3154 | Zuna RE, Mod Pathol 2007; 20: 167

Based on meta-analysis performed by IARC's Infections and Cancer Epidemiology Group up to November 2011, the ICO HPV Information Centre has updated data until June 2015. Reference publications: 1) Guan P, Int J Cancer 2012;131:2349 2) Li N, Int J Cancer 2011;128:927 3) Smith JS, Int J Cancer 2007;121:621 4) Clifford GM, Br J Cancer 2003;88:63 5) Clifford GM, Br J Cancer 2003;89:101.

Figure 60: Comparison of the ten most frequent HPV oncogenic types in United States of America among women with and without cervical lesions



Data updated on 30 Jun 2015 (data as of 30 Jun 2015)

Data Sources:

[1] Contributing studies: Bosch FX, J Natl Cancer Inst 1995; 87: 796 | Bryan JT, J Med Virol 2006; 78: 117 | Burger RA, J Natl Cancer Inst 1996; 88: 1361 | Burnett AF, Gynecol Oncol 1992; 47: 343 | de Sanjose S, Lancet Oncol 2010; 11: 1048 | Ferguson AW, Mod Pathol 1998; 11: 11 | Guo M, Mod Pathol 2007; 20: 256 | Hariri S, PLoS ONE 2012; 7: e34044 | Hopenhayn C, J Low Genit Tract Dis 2014; 18: 182 | Joste NE, Cancer Epidemiol Biomarkers Prev 2015; 24: 230 | Paquette RL, Cancer 1993; 72: 1272 | Patel DA, J Virol Methods 2009; 160: 78 | Pirog EC, Am J Pathol 2000; 157: 1055 | Quint KD, Gynecol Oncol 2009; 114: 390 | Resnick RM, J Natl Cancer Inst 1990; 82: 1477 | Schwartz SM, J Clin Oncol 2001; 19: 1906 | Sebbelov AM, Microbes Infect 2000; 2: 121 | Wentzensen N, Int J Cancer 2009; 124: 964 | Wheeler CM, J Natl Cancer Inst 2009; 101: 475 | Wistuba II, Cancer Res 1997; 57: 3154 | Zuna RE, Mod Pathol 2007; 20: 167

[2] Based on meta-analysis performed by IARC's Infections and Cancer Epidemiology Group up to November 2011, the ICO HPV Information Centre has updated data until June 2015. Reference publications: 1) Guan P, Int J Cancer 2012;131:2349 2) Li N, Int J Cancer 2011;128:927 3) Smith JS, Int J Cancer 2007;121:621 4) Clifford GM, Br J Cancer 2003;88:63 5) Clifford

GM, Br J Cancer 2003;89:101.

[3] Contributing studies: Adam E, Am J Obstet Gynecol 1998; 178: 1235 | Bell MC, Gynecol Oncol 2007; 107: 236 | Castle PE, Cancer Epidemiol Biomarkers Prev 2010; 19: 1675 | Castle PE, Cancer Epidemiol Biomarkers Prev 2011; 20: 946 | Einstein MH, Int J Cancer 2007; 120: 55 | Evans MF, Cancer 2006; 106: 1054 | Evans MF, Eur J Gynaecol Oncol 2003; 24: 373 | Giuliano AR, Cancer Epidemiol Biomarkers Prev 2001; 10: 1129 | Guo M, Mod Pathol 2007; 20: 256 | Hariri S, J Infect Dis 2012; 206: 1878 | Hariri S, PLoS ONE 2012; 7: e34044 | Hu L, Mod Pathol 2005; 18: 267 | Joste NE, Cancer Epidemiol Biomarkers Prev 2015; 24: 230 | Kong CS, Am J Surg Pathol 2007; 31: 33 | Lee SH, Int J Gynaecol Obstet 2009; 105: 210 | Moscicki AB, Obstet Gynecol 2008; 112: 1335 | Stoler MH, Am J Clin Pathol 2011; 135: 468 | Vidal AC, Cancer Causes Control 2014; 25: 1055 | Voss JS, Anal Quant Cytol Histol 2009; 31: 208 | Wentzensen N, Int J Cancer 2009; 124: 964 | Wheeler CM, J Infect Dis 2006; 194: 1291 | Wheeler CM, J Natl Cancer Inst 2009; 101: 475 | Zuna RE, Mod Pathol 2007; 20: 167

[4] Based on meta-analysis performed by IARC's Infections and Cancer Epidemiology Group up to November 2011, the ICO HPV Information Centre has updated data until June 2015. Reference publications: 1) Guan P, Int J Cancer 2012;131:2349 2) Smith JS, Int J Cancer 2007;121:621 3) Clifford GM, Br J Cancer 2003;89:101.

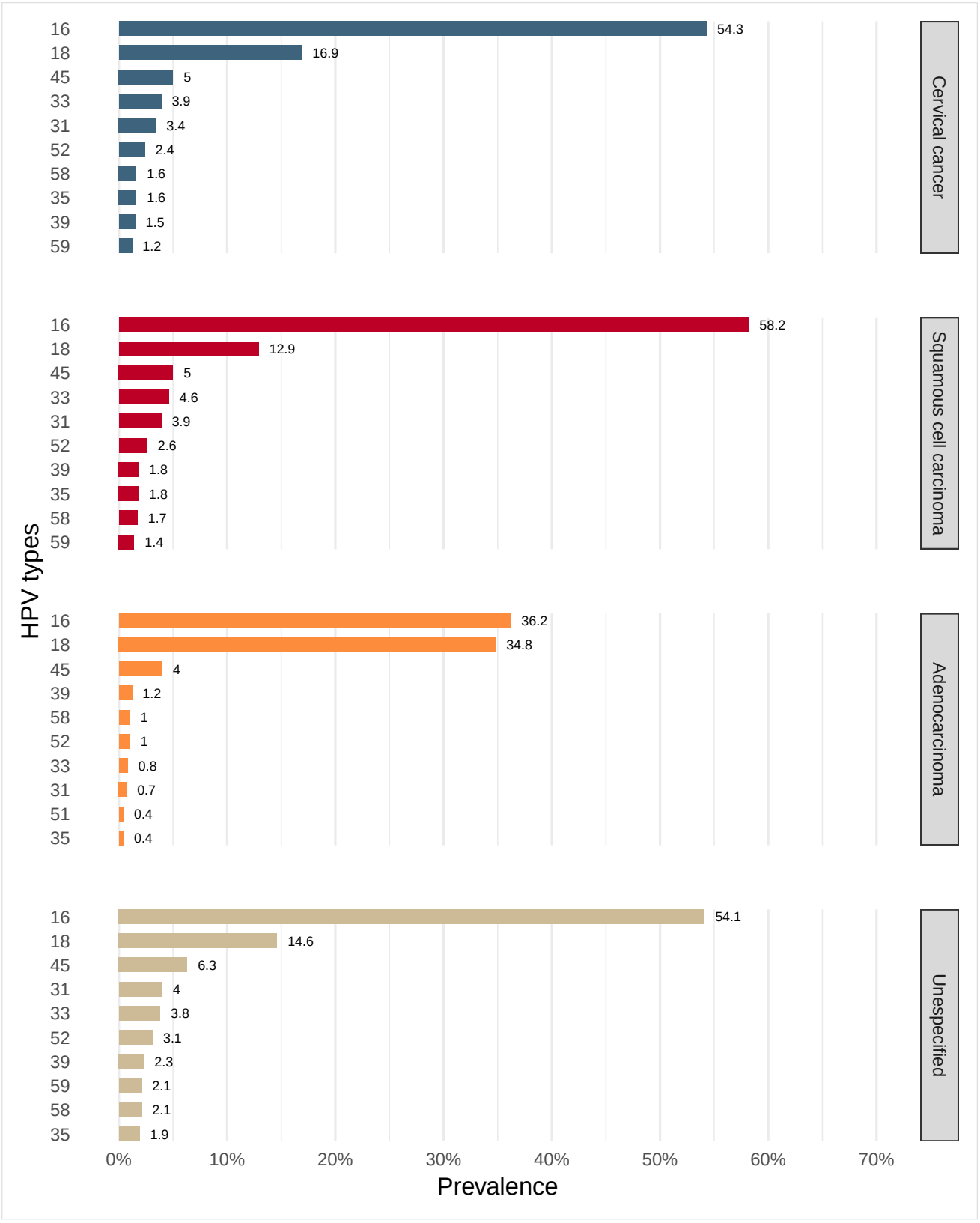
[5] Contributing studies: Adam E, Am J Obstet Gynecol 2000; 182: 257 | Bell MC, Gynecol Oncol 2007; 107: 236 | Brown DR, Sex Transm Dis 2002; 29: 763 | Castle PE, Cancer Epidemiol Biomarkers Prev 2011; 20: 946 | Einstein MH, Int J Cancer 2007; 120: 55 | Evans MF, Cancer 2006; 106: 1054 | Evans MF, Mod Pathol 2002; 15: 1339 | Giuliano AR, Cancer Epidemiol Biomarkers Prev 2001; 10: 1129 | Guo M, Mod Pathol 2007; 20: 256 | Hu L, Mod Pathol 2005; 18: 267 | Jarboe EA, Hum Pathol 2004; 35: 396 | Kong CS, Am J Surg Pathol 2007; 31: 33 | Kulasingam SL, JAMA 2002; 288: 1749 | Lee SH, Int J Gynaecol Obstet 2009; 105: 210 | Liaw KL, J Natl Cancer Inst 1999; 91: 954 | Moscicki AB, Obstet Gynecol 2008; 112: 1335 | Park K, Int J Gynecol Pathol 2007; 26: 457 | Schiff M, Am J Epidemiol 2000; 152: 716 | Stoler MH, Am J Clin Pathol 2011; 135: 468 | Swan DC, J Clin Microbiol 1999; 37: 1030 | Tortolero-Luna G, Cad Saude Publica 1998; 14 Suppl 3: 149 | Vidal AC, Cancer Causes Control 2014; 25: 1055 | Voss JS, Anal Quant Cytol Histol 2009; 31: 208 | Wentzensen N, Int J Cancer 2009; 124: 964 | Wheeler CM, J Infect Dis 2006; 194: 1291 | Wheeler CM, J Natl Cancer Inst 2009; 101: 475 | Zuna RE, Mod Pathol 2007; 20: 167

[6] Based on meta-analysis performed by IARC's Infections and Cancer Epidemiology Group up to November 2011, the ICO HPV Information Centre has updated data until June 2015. Reference publications: 1) Guan P, Int J Cancer 2012;131:2349 2) Clifford GM, Cancer Epidemiol Biomarkers Prev 2005;14:1157

[7] Chaturvedi AK, J Med Virol 2005; 75: 105 | Cibas ES, Gynecol Oncol 2007; 104: 702 | Dunne EF, Cancer Causes Control 2013; 24: 403 | Evans MF, Cancer 2006; 106: 1054 | Giuliano AR, Cancer Epidemiol Biomarkers Prev 2001; 10: 1129 | Goodman MT, Cancer Res 2008; 68: 8813 | Hernandez BY, Nutr Cancer 2004; 49: 109 | Insinga RP, Cancer Epidemiol Biomarkers Prev 2007; 16: 709 | Moscicki AB, JAMA 2001; 285: 2995 | Schiffman M, Cancer Epidemiol Biomarkers Prev 2011; 20: 1398 | Swan DC, J Clin Microbiol 1999; 37: 1030 | Wheeler CM, Int J Cancer 2013; 132: 198 | Wideroff L, Nutr Cancer 1998; 30: 130

[8] Based on systematic reviews and meta-analysis performed by ICO. The ICO HPV Information Centre has updated data until November 2014. Reference publications: 1) Bruni L, J Infect Dis 2010; 202: 1789. 2) De Sanjosé S, Lancet Infect Dis 2007; 7: 453

Figure 61: Comparison of the ten most frequent HPV oncogenic types in United States of America among women with invasive cervical cancer by histology



Data updated on 30 Jun 2015 (data as of 30 Jun 2015)

* No data available. No more types than shown were tested or were positive

Data Sources:

[1] Contributing studies: Bosch FX, J Natl Cancer Inst 1995; 87: 796 | Bryan JT, J Med Virol 2006; 78: 117 | Burger RA, J Natl Cancer Inst 1996; 88: 1361 | Burnett AF, Gynecol Oncol 1992; 47: 343 | de Sanjose S, Lancet Oncol 2010; 11: 1048 | Ferguson AW, Mod Pathol 1998; 11: 11 | Guo M, Mod Pathol 2007; 20: 256 | Hariri S, PLoS ONE 2012; 7: e34044 | Hopenhayn C, J Low Genit Tract Dis 2014; 18: 182 | Joste NE, Cancer Epidemiol Biomarkers Prev 2015; 24: 230 | Paquette RL, Cancer 1993; 72: 1272 | Patel DA, J Virol Methods 2009; 160: 78 | Pirog EC, Am J Pathol 2000; 157: 1055 | Quint KD, Gynecol Oncol 2009; 114: 390 | Resnick RM, J Natl Cancer Inst 1990; 82: 1477 | Schwartz SM, J Clin Oncol 2001; 19: 1906 | Sebbelov AM, Microbes Infect 2000; 2: 121 | Wentzensen N, Int J Cancer 2009; 124: 964 | Wheeler CM, J Natl Cancer Inst 2009; 101: 475 | Wistuba II, Cancer Res 1997; 57: 3154 | Zuna RE, Mod Pathol 2007; 20: 167

[2] Based on meta-analysis performed by IARC's Infections and Cancer Epidemiology Group up to November 2011, the ICO HPV Information Centre has updated data until June 2014.

Reference publications: 1) Guan P, Int J Cancer 2012;131:2349 2) Li N, Int J Cancer 2011;128:927 3) Smith JS, Int J Cancer 2007;121:621 4) Clifford GM, Br J Cancer 2003;88:63 5) Clifford GM, Br J Cancer 2003;89:101.

[3] Based on meta-analysis performed by IARC's Infections and Cancer Epidemiology Group up to November 2011, the ICO HPV Information Centre has updated data until June 2015. Reference publications: 1) Guan P, Int J Cancer 2012;131:2349 2) Li N, Int J Cancer 2011;128:927 3) Smith JS, Int J Cancer 2007;121:621 4) Clifford GM, Br J Cancer 2003;88:63 5) Clifford GM, Br J Cancer 2003;89:101.

Table 22: Type-specific HPV prevalence in women with normal cervical cytology, precancerous cervical lesions and invasive cervical cancer in United States of America

	Normal cytology[1,2]		Low-grade lesions[3,4]		High-grade lesions[5,6]		Cervical cancer[7,8]	
HPV Type	No. tested	HPV Prev % (95% CI)	No. tested	HPV Prev % (95% CI)	No. tested	HPV Prev % (95% CI)	No. tested	HPV Prev % (95% CI)
ONCOGENIC HPV TYPES								
High-risk HPV types								
16	59935	2.9 (2.7-3.0)	4327	16.8 (15.7-17.9)	9476	51.1 (50.1-52.1)	3506	54.3 (52.6-55.9)
18	59935	1.0 (1.0-1.1)	4327	7.9 (7.2-8.8)	9476	6.8 (6.3-7.3)	3506	16.9 (15.7-18.2)
31	58732	1.2 (1.1-1.3)	4169	7.8 (7.0-8.6)	9396	12.1 (11.4-12.7)	3479	3.4 (2.9-4.1)
33	58462	0.4 (0.4-0.5)	3786	3.3 (2.8-3.9)	9370	5.5 (5.1-6.0)	3434	3.9 (3.3-4.6)
35	58732	0.6 (0.6-0.7)	3961	5.6 (4.9-6.3)	9370	6.0 (5.5-6.5)	3385	1.6 (1.2-2.1)
39	58462	1.4 (1.3-1.5)	3612	9.0 (8.1-9.9)	8981	4.5 (4.1-4.9)	3285	1.5 (1.2-2.0)
45	58732	0.8 (0.7-0.9)	4008	4.8 (4.2-5.5)	9139	3.2 (2.9-3.6)	3423	5.0 (4.3-5.7)
51	58279	1.5 (1.4-1.6)	3553	13.0 (11.9-14.1)	8955	7.5 (7.0-8.1)	3285	0.6 (0.4-0.9)
52	58279	1.5 (1.4-1.6)	3484	9.4 (8.5-10.4)	8940	9.4 (8.8-10.0)	3314	2.4 (1.9-2.9)
56	58279	0.8 (0.8-0.9)	3612	9.9 (9.0-10.9)	8981	2.4 (2.1-2.7)	3285	0.9 (0.6-1.2)
58	57106	0.9 (0.8-1.0)	3684	6.5 (5.8-7.4)	9139	6.2 (5.8-6.8)	3314	1.6 (1.3-2.1)
59	58106	1.3 (1.2-1.4)	3612	7.4 (6.6-8.3)	8981	3.2 (2.9-3.6)	3285	1.2 (0.9-1.7)
Probable/possible carcinogen								
26	57279	0.1 (0.1-0.1)	3102	0.8 (0.5-1.2)	8352	0.4 (0.3-0.6)	3086	0.1 (0.0-0.3)
30	18450	0.2 (0.2-0.3)	78	1.3 (0.2-6.9)	31	0.0 (0.0-11.0)	625	0.0 (0.0-0.6)
34	55678	0.1 (0.0-0.1)	231	0.0 (0.0-1.6)	4284	0.0 (0.0-0.1)	1948	0.1 (0.0-0.3)
53	57279	1.9 (1.8-2.0)	3278	10.3 (9.3-11.4)	8402	3.7 (3.3-4.2)	3208	0.5 (0.3-0.8)
66	57279	1.3 (1.2-1.4)	3495	10.6 (9.7-11.7)	8600	3.6 (3.3-4.0)	3208	0.4 (0.2-0.7)
67	55378	0.4 (0.3-0.4)	1730	2.6 (1.9-3.5)	8021	1.1 (0.9-1.3)	1789	0.1 (0.0-0.3)
68	58279	0.7 (0.6-0.7)	3306	4.2 (3.6-5.0)	7559	1.8 (1.6-2.2)	2437	0.5 (0.3-0.8)
69	55378	0.0 (0.0-0.0)	1899	0.5 (0.2-0.9)	8069	0.3 (0.2-0.4)	1337	0.1 (0.0-0.5)
70	55378	0.7 (0.6-0.8)	1940	3.4 (2.6-4.2)	7903	1.2 (1.0-1.5)	3005	0.1 (0.1-0.3)
73	57279	0.6 (0.6-0.7)	3178	3.0 (2.4-3.6)	7149	1.9 (1.6-2.3)	1501	0.7 (0.4-1.2)
82	57279	0.4 (0.4-0.5)	2781	2.8 (2.3-3.5)	8281	2.4 (2.1-2.8)	2309	0.1 (0.0-0.4)
85	18450	0.0 (0.0-0.0)	744	0.5 (0.2-1.4)	3315	0.2 (0.1-0.4)	-	-
97	-	-	-	-	-	-	-	-
LOW RISK HPV TYPES								
6	49446	1.1 (1.0-1.2)	3133	8.8 (7.9-9.9)	8415	2.6 (2.3-2.9)	2523	0.8 (0.5-1.2)
11	49146	0.2 (0.2-0.3)	3074	1.6 (1.2-2.1)	8389	0.5 (0.4-0.7)	3300	0.1 (0.0-0.3)
32	958	0.0 (0.0-0.4)	-	-	-	-	-	-
40	38829	0.4 (0.3-0.4)	239	1.3 (0.4-3.6)	5026	0.4 (0.2-0.6)	1384	0.0 (0.0-0.3)
42	38829	1.1 (1.0-1.2)	239	4.6 (2.6-8.1)	1968	1.2 (0.8-1.8)	2161	0.1 (0.0-0.4)
43	300	0.0 (0.0-1.3)	-	-	-	-	1114	0.0 (0.0-0.3)
44	38829	0.9 (0.8-1.0)	239	2.5 (1.2-5.4)	3146	0.2 (0.1-0.5)	1891	0.1 (0.0-0.3)
54	38529	2.0 (1.9-2.2)	-	-	4938	1.0 (0.8-1.4)	2185	0.3 (0.1-0.6)
55	-	-	-	-	-	-	-	-
57	1901	0.0 (0.0-0.2)	-	-	-	-	925	0.0 (0.0-0.4)
61	37228	1.8 (1.7-2.0)	239	5.9 (3.5-9.6)	5026	0.8 (0.6-1.1)	2028	0.1 (0.0-0.4)
62	36928	2.6 (2.5-2.8)	239	11.7 (8.2-16.4)	5026	0.8 (0.6-1.1)	1078	0.3 (0.1-0.8)
64	-	-	-	-	-	-	-	-
71	37228	0.2 (0.2-0.2)	-	-	4938	0.0 (0.0-0.1)	1855	0.1 (0.0-0.4)
72	37228	0.5 (0.4-0.5)	239	2.1 (0.9-4.8)	5026	0.1 (0.1-0.3)	1855	0.3 (0.1-0.6)
74	-	-	-	-	-	-	1021	0.0 (0.0-0.4)
81	37228	1.0 (0.9-1.1)	239	2.5 (1.2-5.4)	5026	0.2 (0.1-0.3)	1078	0.2 (0.1-0.7)
83	38529	1.2 (1.1-1.3)	239	2.9 (1.4-5.9)	5026	0.4 (0.3-0.7)	1972	0.3 (0.1-0.6)
84	38829	2.1 (1.9-2.2)	239	5.9 (3.5-9.6)	5026	0.5 (0.3-0.7)	1195	0.7 (0.3-1.3)
86	-	-	-	-	-	-	-	-
87	-	-	-	-	-	-	-	-
89	36270	2.0 (1.8-2.1)	-	-	4938	1.1 (0.8-1.4)	1078	0.4 (0.1-1.0)
90	-	-	-	-	-	-	-	-
91	-	-	-	-	-	-	173	0.0 (0.0-2.2)

Data updated on 30 Jun 2015 (data as of 30 Jun 2015 / 30 Nov 2014)

The samples for HPV testing come from cervical specimens (fresh/fixed biopsies or exfoliated cells)

Data Sources:

[1] Chaturvedi AK, J Med Virol 2005; 75: 105 | Cibas ES, Gynecol Oncol 2007; 104: 702 | Dunne EF, Cancer Causes Control 2013; 24: 403 | Evans MF, Cancer 2006; 106: 1054 | Giuliano AR, Cancer Epidemiol Biomarkers Prev 2001; 10: 1129 | Goodman MT, Cancer Res 2008; 68: 8813 | Hernandez BY, Nutr Cancer 2004; 49: 109 | Insinga RP, Cancer Epidemiol Biomarkers Prev 2007; 16: 709 | Moscicki AB, JAMA 2001; 285: 2995 | Schiffman M, Cancer Epidemiol Biomarkers Prev 2011; 20: 1398 | Swan DC, J Clin Microbiol 1999; 37: 1030 | Wheeler CM, Int J Cancer 2013; 132: 198 | Wideroff L, Nutr Cancer 1998; 30: 130

[2] Based on systematic reviews and meta-analysis performed by ICO. The ICO HPV Information Centre has updated data until November 2014. Reference publications: 1) Bruni L, J Infect Dis 2010; 202: 1789. 2) De Sanjosé S, Lancet Infect Dis 2007; 7: 453

[3] Contributing studies: Adam E, Am J Obstet Gynecol 2000; 182: 257 | Bell MC, Gynecol Oncol 2007; 107: 236 | Brown DR, Sex Transm Dis 2002; 29: 763 | Castle PE, Cancer Epidemiol Biomarkers Prev 2011; 20: 946 | Einstein MH, Int J Cancer 2007; 120: 55 | Evans MF, Cancer 2006; 106: 1054 | Evans MF, Mod Pathol 2002; 15: 1339 | Giuliano AR, Cancer Epidemiol Biomarkers Prev 2001; 10: 1129 | Guo M, Mod Pathol 2007; 20: 256 | Hu L, Mod Pathol 2005; 18: 267 | Jarboe EA, Hum Pathol 2004; 35: 396 | Kong CS, Am J Surg Pathol 2007; 31: 33 | Kulasingam SL, JAMA 2002; 288: 1749 | Lee SH, Int J Gynaecol Obstet 2009; 105: 210 | Liaw KL, J Natl Cancer Inst 1999; 91: 954 | Moscicki AB, Obstet Gynecol 2008; 112: 1335 | Park

K, Int J Gynecol Pathol 2007; 26: 457 | Schiff M, Am J Epidemiol 2000; 152: 716 | Stoler MH, Am J Clin Pathol 2011; 135: 468 | Swan DC, J Clin Microbiol 1999; 37: 1030 | Tortolero-Luna G, Cad Saude Publica 1998; 14 Suppl 3: 149 | Vidal AC, Cancer Causes Control 2014; 25: 1055 | Voss JS, Anal Quant Cytol Histol 2009; 31: 208 | Wentzensen N, Int J Cancer 2009; 124: 964 | Wheeler CM, J Infect Dis 2006; 194: 1291 | Wheeler CM, J Natl Cancer Inst 2009; 101: 475 | Zuna RE, Mod Pathol 2007; 20: 167

[4] Based on meta-analysis performed by IARC's Infections and Cancer Epidemiology Group up to November 2011, the ICO HPV Information Centre has updated data until June 2015. Reference publications: 1) Guan P, Int J Cancer 2012;131:2349 2) Clifford GM, Cancer Epidemiol Biomarkers Prev 2005;14:1157

[5] Contributing studies: Adam E, Am J Obstet Gynecol 1998; 178: 1235 | Bell MC, Gynecol Oncol 2007; 107: 236 | Castle PE, Cancer Epidemiol Biomarkers Prev 2010; 19: 1675 | Castle PE, Cancer Epidemiol Biomarkers Prev 2011; 20: 946 | Einstein MH, Int J Cancer 2007; 120: 55 | Evans MF, Cancer 2006; 106: 1054 | Evans MF, Eur J Gynaecol Oncol 2003; 24: 373 | Giuliano AR, Cancer Epidemiol Biomarkers Prev 2001; 10: 1129 | Guo M, Mod Pathol 2007; 20: 256 | Hariri S, J Infect Dis 2012; 206: 1878 | Hariri S, PLoS ONE 2012; 7: e34044 | Hu L, Mod Pathol 2005; 18: 267 | Joste NE, Cancer Epidemiol Biomarkers Prev 2015; 24: 230 | Kong CS, Am J Surg Pathol 2007; 31: 33 | Lee SH, Int J Gynaecol Obstet 2009; 105: 210 | Moscicki AB, Obstet Gynecol 2008; 112: 1335 | Stoler MH, Am J Clin Pathol 2011; 135: 468 | Vidal AC, Cancer Causes Control 2014; 25: 1055 | Voss JS, Anal Quant Cytol Histol 2009; 31: 208 | Wentzensen N, Int J Cancer 2009; 124: 964 | Wheeler CM, J Infect Dis 2006; 194: 1291 | Wheeler CM, J Natl Cancer Inst 2009; 101: 475 | Zuna RE, Mod Pathol 2007; 20: 167

[6] Based on meta-analysis performed by IARC's Infections and Cancer Epidemiology Group up to November 2011, the ICO HPV Information Centre has updated data until June 2015. Reference publications: 1) Guan P, Int J Cancer 2012;131:2349 2) Smith JS, Int J Cancer 2007;121:621 3) Clifford GM, Br J Cancer 2003;89:101.

[7] Contributing studies: Bosch FX, J Natl Cancer Inst 1995; 87: 796 | Bryan JT, J Med Virol 2006; 78: 117 | Burger RA, J Natl Cancer Inst 1996; 88: 1361 | Burnett AF, Gynecol Oncol 1992; 47: 343 | de Sanjose S, Lancet Oncol 2010; 11: 1048 | Ferguson AW, Mod Pathol 1998; 11: 11 | Guo M, Mod Pathol 2007; 20: 256 | Hariri S, PLoS ONE 2012; 7: e34044 | Hopenhayn C, J Low Genit Tract Dis 2014; 18: 182 | Joste NE, Cancer Epidemiol Biomarkers Prev 2015; 24: 230 | Paquette RL, Cancer 1993; 72: 1272 | Patel DA, J Virol Methods 2009; 160: 78 | Pirog EC, Am J Pathol 2000; 157: 1055 | Quint KD, Gynecol Oncol 2009; 114: 390 | Resnick RM, J Natl Cancer Inst 1990; 82: 1477 | Schwartz SM, J Clin Oncol 2001; 19: 1906 | Sebbelov AM, Microbes Infect 2000; 2: 121 | Wentzensen N, Int J Cancer 2009; 124: 964 | Wheeler CM, J Natl Cancer Inst 2009; 101: 475 | Wistuba II, Cancer Res 1997; 57: 3154 | Zuna RE, Mod Pathol 2007; 20: 167

[8] Based on meta-analysis performed by IARC's Infections and Cancer Epidemiology Group up to November 2011, the ICO HPV Information Centre has updated data until June 2015. Reference publications: 1) Guan P, Int J Cancer 2012;131:2349 2) Li N, Int J Cancer 2011;128:927 3) Smith JS, Int J Cancer 2007;121:621 4) Clifford GM, Br J Cancer 2003;88:63 5) Clifford GM, Br J Cancer 2003;89:101.

Table 23: Type-specific HPV prevalence among invasive cervical cancer cases in United States of America by histology

	Any Histology		Squamous cell carcinoma		Adenocarcinoma		Unespecified	
HPV Type	No. tested	HPV Prev % (95% CI)	No. tested	HPV Prev % (95% CI)	No. tested	HPV Prev % (95% CI)	No. tested	HPV Prev % (95% CI)
ONCOGENIC HPV TYPES								
High-risk HPV types								
16	3506	54.3 (52.6-55.9)	2723	58.2 (56.3-60.0)	563	36.2 (32.4-40.3)	1002	54.1 (51.0-57.2)
18	3506	16.9 (15.7-18.2)	2723	12.9 (11.6-14.2)	563	34.8 (31.0-38.8)	1002	14.6 (12.5-16.9)
31	3479	3.4 (2.9-4.1)	2723	3.9 (3.3-4.7)	536	0.7 (0.3-1.9)	1002	4.0 (2.9-5.4)
33	3434	3.9 (3.3-4.6)	2695	4.6 (3.9-5.5)	519	0.8 (0.3-2.0)	1002	3.8 (2.8-5.2)
35	3385	1.6 (1.2-2.1)	2646	1.8 (1.3-2.4)	519	0.4 (0.1-1.4)	1002	1.9 (1.2-2.9)
39	3285	1.5 (1.2-2.0)	2546	1.8 (1.3-2.4)	519	1.2 (0.5-2.5)	1002	2.3 (1.5-3.4)
45	3423	5.0 (4.3-5.7)	2657	5.0 (4.2-5.9)	546	4.0 (2.7-6.0)	1002	6.3 (4.9-8.0)
51	3285	0.6 (0.4-0.9)	2546	0.6 (0.4-1.0)	519	0.4 (0.1-1.4)	1002	1.0 (0.5-1.8)
52	3314	2.4 (1.9-2.9)	2575	2.6 (2.0-3.2)	519	1.0 (0.4-2.2)	1002	3.1 (2.2-4.4)
56	3285	0.9 (0.6-1.2)	2546	0.9 (0.6-1.4)	519	0.2 (0.0-1.1)	1002	1.2 (0.7-2.1)
58	3314	1.6 (1.3-2.1)	2575	1.7 (1.3-2.3)	519	1.0 (0.4-2.2)	1002	2.1 (1.4-3.2)
59	3285	1.2 (0.9-1.7)	2546	1.4 (1.0-1.9)	519	0.0 (0.0-0.7)	1002	2.1 (1.4-3.2)
Probable/possible carcinogen								
26	3086	0.1 (0.0-0.3)	-	-	-	-	-	-
30	625	0.0 (0.0-0.6)	501	0.0 (0.0-0.8)	124	0.0 (0.0-3.0)	-	-
34	1948	0.1 (0.0-0.3)	790	0.1 (0.0-0.7)	350	0.0 (0.0-1.1)	808	0.0 (0.0-0.5)
53	3208	0.5 (0.3-0.8)	-	-	-	-	-	-
66	3208	0.4 (0.2-0.7)	2546	0.4 (0.2-0.8)	519	0.4 (0.1-1.4)	925	0.2 (0.1-0.8)
67	1789	0.1 (0.0-0.3)	810	0.1 (0.0-0.7)	171	0.0 (0.0-2.2)	808	0.0 (0.0-0.5)
68	2437	0.5 (0.3-0.8)	1886	0.5 (0.3-0.9)	479	0.0 (0.0-0.8)	194	1.0 (0.3-3.7)
69	1337	0.1 (0.0-0.5)	-	-	-	-	-	-
70	3005	0.1 (0.1-0.3)	-	-	-	-	-	-
73	1501	0.7 (0.4-1.2)	-	-	-	-	-	-
82	2309	0.1 (0.0-0.4)	1109	0.2 (0.0-0.7)	275	0.0 (0.0-1.4)	925	0.1 (0.0-0.6)
85	-	-	-	-	-	-	-	-
97	-	-	-	-	-	-	-	-
LOW RISK HPV TYPES								
6	2523	0.8 (0.5-1.2)	-	-	-	-	-	-
11	3300	0.1 (0.0-0.3)	-	-	-	-	-	-
32	-	-	-	-	-	-	-	-
40	1384	0.0 (0.0-0.3)	-	-	-	-	-	-
42	2161	0.1 (0.0-0.4)	1820	0.2 (0.1-0.5)	222	0.0 (0.0-1.7)	901	0.1 (0.0-0.6)
43	1114	0.0 (0.0-0.3)	-	-	-	-	-	-
44	1891	0.1 (0.0-0.3)	1597	0.1 (0.0-0.4)	175	0.0 (0.0-2.1)	901	0.0 (0.0-0.4)
54	2185	0.3 (0.1-0.6)	-	-	-	-	-	-
55	-	-	-	-	-	-	-	-
57	925	0.0 (0.0-0.4)	-	-	-	-	-	-
61	2028	0.1 (0.0-0.4)	-	-	-	-	-	-
62	1078	0.3 (0.1-0.8)	-	-	-	-	-	-
64	-	-	-	-	-	-	-	-
71	1855	0.1 (0.0-0.4)	-	-	-	-	-	-
72	1855	0.3 (0.1-0.6)	-	-	-	-	-	-
74	1021	0.0 (0.0-0.4)	-	-	-	-	-	-
81	1078	0.2 (0.1-0.7)	-	-	-	-	-	-
83	1972	0.3 (0.1-0.6)	-	-	-	-	-	-
84	1195	0.7 (0.3-1.3)	-	-	-	-	-	-
86	-	-	-	-	-	-	-	-
87	-	-	-	-	-	-	-	-
89	1078	0.4 (0.1-1.0)	-	-	-	-	-	-
90	-	-	-	-	-	-	-	-
91	173	0.0 (0.0-2.2)	-	-	-	-	-	-

Data updated on 19 May 2017 (data as of 30 Jun 2015)

The samples for HPV testing come from cervical specimens (fresh/fixed biopsies or exfoliated cells)
[a] Number of women tested
[b] 95% Confidence Interval

Data Sources:

Contributing studies: Bosch FX, J Natl Cancer Inst 1995; 87: 796 | Bryan JT, J Med Virol 2006; 78: 117 | Burger RA, J Natl Cancer Inst 1996; 88: 1361 | Burnett AF, Gynecol Oncol 1992; 47: 343 | de Sanjose S, Lancet Oncol 2010; 11: 1048 | Ferguson AW, Mod Pathol 1998; 11: 11 | Guo M, Mod Pathol 2007; 20: 256 | Hariri S, PLoS ONE 2012; 7: e34044 | Hopenhayn C, J Low Genit Tract Dis 2014; 18: 182 | Joste NE, Cancer Epidemiol Biomarkers Prev 2015; 24: 230 | Paquette RL, Cancer 1993; 72: 1272 | Patel DA, J Virol Methods 2009; 160: 78 | Pirog EC, Am J Pathol 2000; 157: 1055 | Quint KD, Gynecol Oncol 2009; 114: 390 | Resnick RM, J Natl Cancer Inst 1990; 82: 1477 | Schwartz SM, J Clin Oncol 2001; 19: 1906 | Sebbelov AM, Microbes Infect 2000; 2: 121 | Wentzensen N, Int J Cancer 2009; 124: 964 | Wheeler CM, J Natl Cancer Inst 2009; 101: 475 | Wistuba II, Cancer Res 1997; 57: 3154 | Zuna RE, Mod Pathol 2007; 20: 167

Based on meta-analysis performed by IARC's Infections and Cancer Epidemiology Group up to November 2011, the ICO HPV Information Centre has updated data until June 2015. Reference publications: 1) Guan P, Int J Cancer 2012;131:2349 2) Li N, Int J Cancer 2011;128:927 3) Smith JS, Int J Cancer 2007;121:621 4) Clifford GM, Br J Cancer 2003;88:63 5) Clifford GM, Br J Cancer 2003;89:101.

4.1.3 HPV type distribution among HIV+ women with normal cervical cytology

Table 24: Studies on HPV prevalence among HIV+ women with normal cytology in United States of America

Study	HPV detection method and targeted HPV types	HPV Prevalence			
		No. Tested[a]	%	(95% CI)[b]	Prevalence of 5 most frequent HPVs, HPV type (%)
-	-	-	-	-	

Data updated on 31 Dec 2011 (data as of 31 Dec 2011)

DBH: Dot Blot Hybridization; EIA: Enzyme ImmunoAssay; HC2: Hybrid Capture 2; PCR: Polymerase Chain Reaction; TS: Type Specific
[a] Number of women tested
[b] 95% Confidence Interval
Data Sources:
Systematic review and meta-analysis were performed by the ICO HPV Information Centre up to December 2011. Selected studies had to include at least 20 HIV positive women who had both normal cervical cytology and HPV test results (PCR or HC2).

4.1.4 Terminology

Cytologically normal women
No abnormal cells are observed on the surface of their cervix upon cytology.

Cervical Intraepithelial Neoplasia (CIN) / Squamous Intraepithelial Lesions (SIL)
SIL and CIN are two commonly used terms to describe precancerous lesions or the abnormal growth of squamous cells observed in the cervix. SIL is an abnormal result derived from cervical cytological screening or Pap smear testing. CIN is a histological diagnosis made upon analysis of cervical tissue obtained by biopsy or surgical excision. The condition is graded as CIN 1, 2 or 3, according to the thickness of the abnormal epithelium (1/3, 2/3 or the entire thickness).

Low-grade cervical lesions (LSIL/CIN-1)
Low-grade cervical lesions are defined by early changes in size, shape, and number of abnormal cells formed on the surface of the cervix and may be referred to as mild dysplasia, LSIL, or CIN-1.

High-grade cervical lesions (HSIL/ CIN-2 / CIN-3 / CIS)
High-grade cervical lesions are defined by a large number of precancerous cells on the surface of the cervix that are distinctly different from normal cells. They have the potential to become cancerous cells and invade deeper tissues of the cervix. These lesions may be referred to as moderate or severe dysplasia, HSIL, CIN-2, CIN-3 or cervical carcinoma in situ (CIS).

Carcinoma in situ (CIS)
Preinvasive malignancy limited to the epithelium without invasion of the basement membrane. CIN 3 encompasses the squamous carcinoma in situ.

Invasive cervical cancer (ICC) / Cervical cancer
If the high-grade precancerous cells invade the basement membrane is called ICC. ICC stages range from stage I (cancer is in the cervix or uterus only) to stage IV (the cancer has spread to distant organs, such as the liver).

Invasive squamous cell carcinoma
Invasive carcinoma composed of cells resembling those of squamous epithelium.

Adenocarcinoma
Invasive tumour with glandular and squamous elements intermingled.

4.2 HPV burden in anogenital cancers other than cervix

Methods: Prevalence and type distribution of human papillomavirus in carcinoma of the vulva, vagina, anus and penis: systematic review and meta-analysis

A systematic review of the literature was conducted on the worldwide HPV-prevalence and type distribution for anogenital carcinomas other than cervix from January 1986 to 'data as of' indicated in each section. The search terms for the review were 'HPV' AND (anus OR anal) OR (penile) OR vagin* OR vulv* using Pubmed. There were no limits in publication language. References cited in selected articles were also investigated. Inclusion criteria were: HPV DNA detection by means of PCR, a minimum of 10 cases by lesion and a detailed description of HPV DNA detection and genotyping techniques used. The number of cases tested and HPV positive cases were extracted for each study to estimate the prevalence of HPV DNA and the HPV type distribution. Binomial 95% confidence intervals were calculated for each HPV prevalence.

4.2.1 Anal cancer and precancerous anal lesions

Anal cancer is similar to cervical cancer with respect to overall HPV DNA positivity, with approximately 100% of anal squamous cell carcinoma cases associated with HPV infection worldwide (de Martel C et al. Lancet Glob Health 2020;8(2):e180-e190). HPV16 is the most common type detected, representing 73% of all HPV-positive tumours. HPV18 is the second most common type detected and is found in approximately 5% of cases. HPV DNA is also detected in the majority of precancerous anal lesions (AIN) (91.5% in AIN1 and 93.9% in AIN2/3) (De Vuyst H et al. Int J Cancer 2009; 124: 1626-36). In this section, the burden of HPV among cases of anal cancers and precancerous anal lesions in United States of America are presented.

Table 25: Studies on HPV prevalence among anal cancer cases in United States of America (male and female)

Study	HPV detection method and targeted HPV types	HPV Prevalence			
		No. Tested	%	(95% CI)[a]	Prevalence of 5 most frequent HPVs, HPV type (%)
Alemany 2015	PCR-SPF10, EIA, (HPV 6, 11, 16, 18, 26, 30, 31, 33, 34, 35, 39, 40, 42, 43, 44, 45, 51, 52, 53, 54, 56, 58, 59, 61, 66, 67, 68, 69, 70, 73, 74, 82, 83, 87, 89, 91)	96	95.8	(89.8-98.4)	HPV 16 (81.3), HPV 18 (7.3), HPV 31 (4.2), HPV 39 (3.1), HPV 52 (3.1)
Daling 2004	PCR-MY09/11, PCR L1-Consensus primer, RFLP, TS (HPV 16, 18)	199	86.9	(81.5-90.9)	HPV 16 (69.8), HPV 18 (8.5)
Palefsky 1991	PCR-E6, TS (HPV 06/11, 16, 18, 31, 33)	13	84.6	(57.8-95.7)	HPV 16 (76.9), HPV 31 (23.1), HPV 6/11 (15.4), HPV 33 (7.7)
Zaki 1992	PCR L1-Consensus primer, TS (HPV 6, 11, 16, 18, 16/18)	11	72.7	(43.4-90.3)	HPV 16 (18.2), HPV 11 (9.1), HPV 16/18 (9.1), HPV 6 (9.1)

Data updated on 30 Jun 2015 (data as of 30 Jun 2015)

DBH: Dot Blot Hybridization; EIA: Enzyme ImmunoAssay; HC2: Hybrid Capture 2; ISH: In Situ Hybridization; LBA: Line-Blot Assay; LiPA: Line Probe Assay; PCR: Polymerase Chain Reaction; RFLP: Restriction Fragment Length Polymorphism; RLBH: Reverse Line Blot Hybridization; RT-PCR: Real Time Polymerase Chain Reaction; SBH: Southern Blot Hybridization; SPF: Short Primer Fragment; TS: Type Specific;
[a] 95% Confidence Interval
Data Sources:
Alemany L, Int J Cancer 2015; 136: 98 | Daling JR, Cancer 2004; 101: 270 | Palefsky JM, Cancer Res 1991; 51: 1014 | Zaki SR, Am J Pathol 1992; 140: 1345
Based on systematic reviews (up to 2008) performed by ICO for the IARC Monograph on the Evaluation of Carcinogenic Risks to Humans volume 100B and IARC's Infections and Cancer Epidemiology Group. The ICO HPV Information Centre has updated data until June 2015. Reference publications: 1) Bouvard V, Lancet Oncol 2009;10:321 2) De Vuyst H, Int J Cancer 2009;124:1626

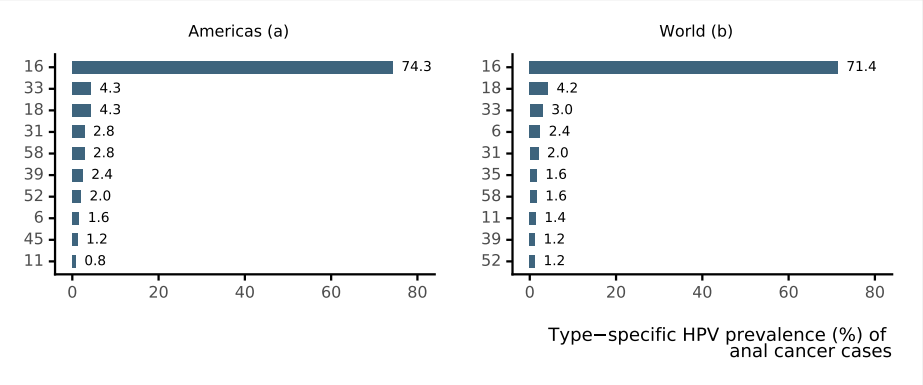
Table 26: Studies on HPV prevalence among cases of AIN2/3 in United States of America

Study[b]	HPV detection method and targeted HPV types	HPV Prevalence			
		No. Tested	%	(95% CI)[a]	Prevalence of 5 most frequent HPVs, HPV type (%)
Sahasrabuddhe 2013	PCR-PGMY09/11, LBA (HPV 6, 11, 16, 18, 26, 31, 33, 34, 35, 39, 40, 42, 44, 45, 51, 52, 53, 54, 56, 58, 59, 61, 62, 66, 67, 68, 69, 70, 71, 72, 73, 81, 82, 83, 84)	104	99.0	(94.8-99.8)	HPV 16 (54.8), HPV 6 (26.0), HPV 31 (22.1), HPV 42 (22.1), HPV 66 (21.2)

Data updated on 30 Jun 2015 (data as of 30 Jun 2015)

DBH: Dot Blot Hybridization; EIA: Enzyme ImmunoAssay; HC2: Hybrid Capture 2; ISH: In Situ Hybridization; LBA: Line-Blot Assay; LiPA: Line Probe Assay; PCR: Polymerase Chain Reaction; RFLP: Restriction Fragment Length Polymorphism; RLBH: Reverse Line Blot Hybridization; RT-PCR: Real Time Polymerase Chain Reaction; SBH: Southern Blot Hybridization; SPF: Short Primer Fragment; TS: Type Specific;
AIN 2/3: Anal intraepithelial neoplasia of grade 2/3
[a] 95% Confidence Interval
[b] HIV positive cases
Data Sources:
Sahasrabuddhe VV, J Infect Dis 2013; 207: 392
Based on systematic reviews (up to 2008) performed by ICO for the IARC Monograph on the Evaluation of Carcinogenic Risks to Humans volume 100B and IARC's Infections and Cancer Epidemiology Group. The ICO HPV Information Centre has updated data until June 2015. Reference publications: 1) Bouvard V, Lancet Oncol 2009;10:321 2) De Vuyst H, Int J Cancer 2009;124:1626

Figure 62: Comparison of the ten most frequent HPV types in anal cancer cases in Americas and the World



Data updated on 9 Feb 2017 (data as of 30 Jun 2014)

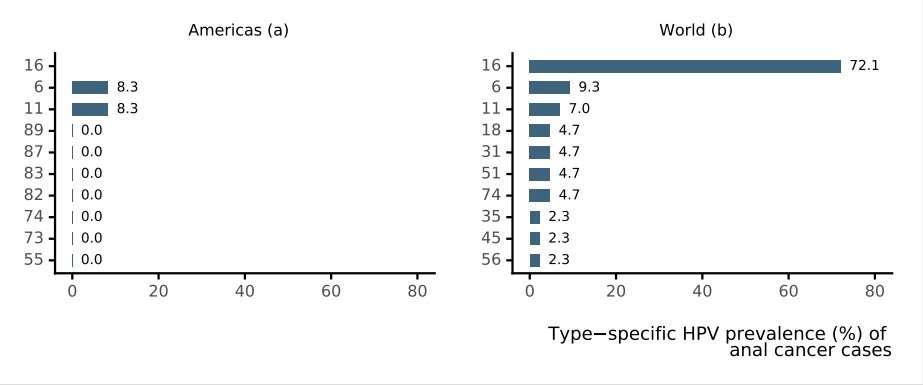
[a] Includes cases from Chile, Colombia, Ecuador, Guatemala, Honduras, Mexico, Paraguay and United States

[b] Includes cases from Europe (Bosnia-Herzegovina, Czech Republic, France, Germany, Poland, Portugal, Slovenia, Spain and United Kingdom); America (Chile, Colombia, Ecuador, Guatemala, Honduras, Mexico, Paraguay and United States); Africa (Mali, Nigeria and Senegal); Asia (Bangladesh,India and South Korea)

Data Sources:

Data from Alemany L, Int J Cancer 2015; 136: 98. This study has gathered the largest international series of anal cancer cases and precancerous lesions worldwide using a standard protocol with a highly sensitive HPV DNA detection assay.

Figure 63: Comparison of the ten most frequent HPV types in AIN 2/3 cases in Americas and the World



Data updated on 7 Feb 2017 (data as of 30 Jun 2014)

AIN 2/3: Anal intraepithelial neoplasia of grade 2/3

[a] Includes cases from Chile, Colombia, Ecuador, Guatemala, Honduras, Mexico, Paraguay

[b] Includes cases from Europe (Bosnia-Herzegovina, Czech Republic, France, Germany, Poland, Portugal, Slovenia, Spain and United Kingdom); America (Chile, Colombia, Ecuador, Guatemala, Honduras, Mexico, Paraguay)

Data Sources:

Data from Alemany L, Int J Cancer 2015; 136: 98. This study has gathered the largest international series of anal cancer cases and precancerous lesions worldwide using a standard protocol with a highly sensitive HPV DNA detection assay.

4.2.2 Vulvar cancer and precancerous vulvar lesions

HPV attribution for vulvar cancer is 48% among age 15-54 years, 28% among age 55-64 years, and 15% among age 65+ worldwide (de Martel C et al. Lancet Glob Health 2020;8(2):e180-e190). Vulvar cancer has two distinct histological patterns with two different risk factor profiles: (1) basaloid/warty types (2) keratinising types. Basaloid/warty lesions are more common in young women, are frequently found adjacent to VIN, are very often associated with HPV DNA detection (86%), and have a similar risk factor profile as cervical cancer. Keratinising vulvar carcinomas represent the majority of the vulvar lesions (>60%). These lesions develop from non HPV-related chronic vulvar dermatoses, especially lichen sclerosus and/or squamous hyperplasia, their immediate cancer precursor lesion is differentiated VIN, they occur more often in older women, and are rarely associated with HPV (6%) or with any of the other risk factors typical of cervical cancer. HPV prevalence is frequently detected among cases of high-grade VIN (VIN2/3) (85.3%). HPV 16 is the most common type detected followed by HPV 33 (De Vuyst H et al. Int J Cancer 2009; 124: 1626-36). In this section, the HPV burden among cases of vulvar cancer cases and precancerous vulvar lesions in United States of America are presented.

Table 27: Studies on HPV prevalence among vulvar cancer cases in United States of America

Study	HPV detection method and targeted HPV types	HPV Prevalence			
		No. Tested	%	(95% CI)[a]	Prevalence of 5 most frequent HPVs, HPV type (%)
de Sanjosé 2013	PCR-SPF10, EIA, (HPV 6, 11, 16, 18, 26, 30, 31, 33, 34, 35, 39, 40, 42, 43, 44, 45, 51, 52, 53, 54, 56, 58, 59, 61, 66, 67, 68, 69, 70, 73, 74, 82, 83, 87, 89, 91)	50	50	(36.6-63.4)	HPV 16 (34.0), HPV 33 (8.0), HPV 18 (2.0), HPV 44 (2.0), HPV 58 (2.0)
Gargano 2012	PCR-SPF10, LBA, (HPV 6, 11, 16, 18, 26, 31, 33, 34, 35, 39, 40, 42, 43, 44, 45, 51, 52, 53, 54, 56, 58, 59, 61, 62, 66, 67, 68, 69, 70, 71, 72, 73, 74, 81, 82, 83, 84)	176	68.8	(61.6-75.1)	HPV 16 (48.3), HPV 33 (10.2), HPV 52 (2.8), HPV 18 (1.7), HPV 31 (1.1)
Kim 1996	PCR-MY09/11, PCR L1-Consensus primer, TS, Sequencing (HPV 16, 18)	18	38.9	(20.3-61.4)	HPV 16 (27.8), HPV 18 (5.6)
Madeleine 1997	PCR-MY09/11, PCR L1-Consensus primer, PCR-E6, RFLP (HPV 16)	55	50.9	(38.1-63.6)	HPV 16 (43.6)
Riethdorf 2004[b]	PCR L1-Consensus primer, TS (HPV 16)	71	87.3	(77.6-93.2)	HPV 16 (87.3)
Sutton 2008	PCR L1-Consensus primer, LBA (HPV 6, 11, 16, 18, 26, 31, 33, 34, 35, 39, 40, 42, 45, 51, 52, 53, 54, 56, 58, 59, 61, 62, 66, 67, 68, 70, 71, 72, 73, 81, 82, 83, 84)	116	69.8	(60.9-77.4)	HPV 16 (56.0), HPV 33 (10.3), HPV 45 (3.4), HPV 52 (2.6), HPV 6 (2.6)
Tate 1994	PCR-MY09/11, PCR L1-Consensus primer, RFLP (HPV 16, 33)	13	53.8	(29.1-76.8)	HPV 16 (46.2), HPV 33 (7.7)

Data updated on 30 Jun 2015 (data as of 30 Jun 2015)

DBH: Dot Blot Hybridization; EIA: Enzyme ImmunoAssay; HC2: Hybrid Capture 2; ISH: In Situ Hybridization; LBA: Line-Blot Assay; LiPA: Line Probe Assay; PCR: Polymerase Chain Reaction; RFLP: Restriction Fragment Length Polymorphism; RLBH: Reverse Line Blot Hybridization; RT-PCR: Real Time Polymerase Chain Reaction; SBH: Southern Blot Hybridization; SPF: Short Primer Fragment; TS: Type Specific;

[a] 95% Confidence Interval

[b] Includes cases from Germany and United States of America

Data Sources:

de Sanjosé S, Eur J Cancer 2013; 49: 3450 | Gargano JW, J Low Genit Tract Dis 2012; 16: 471 | Kim YT, Hum Pathol 1996; 27: 389 | Madeleine MM, J Natl Cancer Inst 1997; 89: 1516 | Riethdorf S, Hum Pathol 2004; 35: 1477 | Sutton BC, Mod Pathol 2008; 21: 345 | Tate JE, Gynecol Oncol 1994; 53: 78

Based on systematic reviews (up to 2008) performed by ICO for the IARC Monograph on the Evaluation of Carcinogenic Risks to Humans volume 100B and IARC's Infections and Cancer Epidemiology Group. The ICO HPV Information Centre has updated data until June 2015. Reference publications: 1) Bouvard V, Lancet Oncol 2009;10:321 2) De Vuyst H, Int J Cancer 2009;124:1626

Table 28: Studies on HPV prevalence among VIN 2/3 cases in United States of America

Study	HPV detection method and targeted HPV types	HPV Prevalence			
		No. Tested	%	(95% CI)[a]	Prevalence of 5 most frequent HPVs, HPV type (%)
Gargano 2012	PCR-SPF10, LBA, (HPV 16, 18, 33, 52, 59)	68	97.1	(89.9-99.2)	HPV 16 (80.9), HPV 33 (8.8), HPV 59 (2.9), HPV 18 (1.5)
Madeleine 1997	PCR-MY09/11, PCR L1-Consensus primer, PCR-E6, RFLP (HPV 16)	253	71.5	(65.7-76.7)	HPV 16 (61.7)

Continued on next page

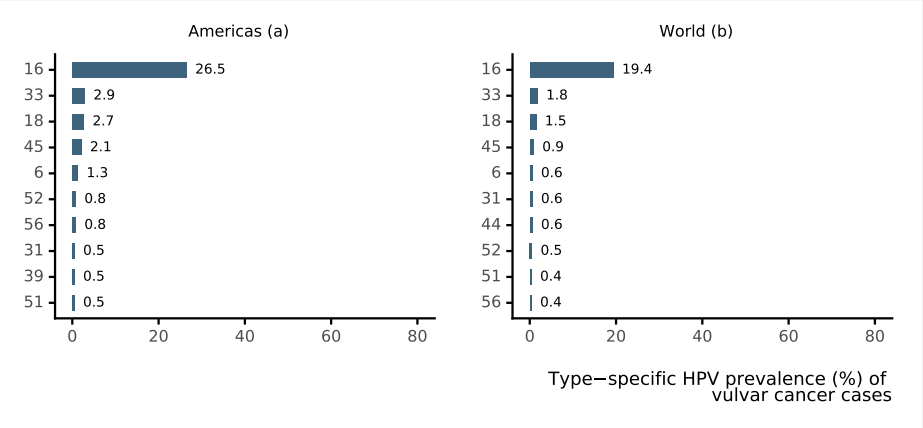
Table 28 – continued from previous page

Study	HPV detection method and targeted HPV types	Prevalence			
		No. Tested	%	(95% CI)[a]	Prevalence of 5 most frequent HPVs, HPV type (%)
Riethdorf 2004[b]	PCR L1-Consensus primer, TS (HPV 16)	60	68.3	(55.8-78.7)	HPV 16 (68.3)
Srodon 2006	PCR-MY09/11, PCR-SPF10, , Sequencing (HPV 6, 11, 16, 18, 20, 21, 22, 23, 26, 30, 31, 32, 33, 34, 35, 38, 39, 40, 42, 43, 44, 45, 51, 52, 53, 54, 56, 57, 58, 59, 60, 61, 62, 66, 67, 68, 69, 70, 71, 72, 73, 74, 80, 81, 82, 83, 84, 85, 86, 87, 89, 90, 91)	34	100	(89.8-100.0)	HPV 16 (91.2), HPV 18 (5.9), HPV 35 (5.9), HPV 11 (2.9), HPV 33 (2.9)

Data updated on 30 Jun 2015 (data as of 30 Jun 2015)

DBH: Dot Blot Hybridization; EIA: Enzyme ImmunoAssay; HC2: Hybrid Capture 2; ISH: In Situ Hybridization; LBA: Line-Blot Assay; LiPA: Line Probe Assay; PCR: Polymerase Chain Reaction; RFLP: Restriction Fragment Length Polymorphism; RLBH: Reverse Line Blot Hybridization; RT-PCR: Real Time Polymerase Chain Reaction; SBH: Southern Blot Hybridization; SPF: Short Primer Fragment; TS: Type Specific;
VIN 2/3: Vulvar intraepithelial neoplasia of grade 2/3
[a] 95% Confidence Interval
[b] Includes cases from Germany and United States of America
Data Sources:
Gargano JW, J Low Genit Tract Dis 2012; 16: 471 | Madeleine MM, J Natl Cancer Inst 1997; 89: 1516 | Riethdorf S, Hum Pathol 2004; 35: 1477 | Srodon M, Am J Surg Pathol 2006; 30: 1513
Based on systematic reviews (up to 2008) performed by ICO for the IARC Monograph on the Evaluation of Carcinogenic Risks to Humans volume 100B and IARC's Infections and Cancer Epidemiology Group. The ICO HPV Information Centre has updated data until June 2015. Reference publications: 1) Bouvard V, Lancet Oncol 2009;10:321 2) De Vuyst H, Int J Cancer 2009;124:1626

Figure 64: Comparison of the ten most frequent HPV types in cases of vulvar cancer in Americas and the World



Data updated on 30 Jun 2015 (data as of 30 Jun 2015)

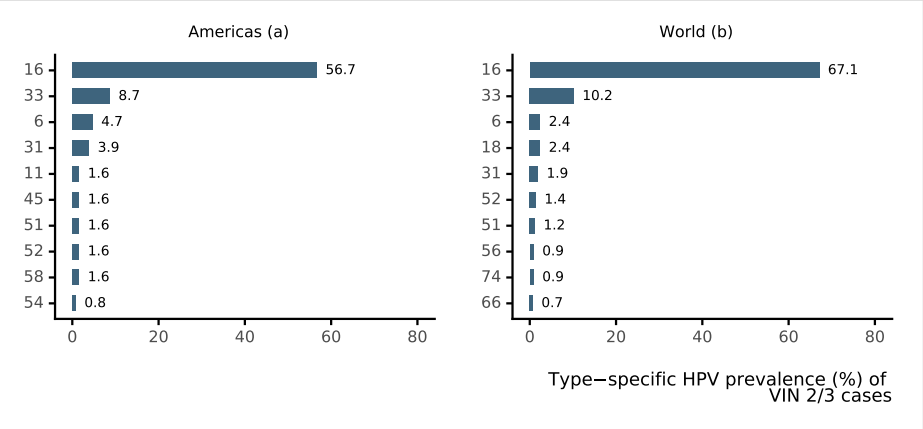
[a] Includes cases from Argentina, Brazil, Chile, Colombia, Ecuador, Guatemala, Honduras, Mexico, Paraguay, Uruguay, United States of America and Venezuela

[b] Includes cases from America (Argentina, Brazil, Chile, Colombia, Ecuador, Guatemala, Honduras, Mexico, Paraguay, Uruguay, United States of America and Venezuela); Africa (Mali, Mozambique, Nigeria, and Senegal); Oceania (Australia and New Zealand); Europe (Austria, Belarus, Bosnia-Herzegovina, Czech Republic, France, Germany, Greece, Italy, Poland, Portugal, Spain and United Kingdom); and in Asia (Bangladesh, India, Israel, South Korea, Kuwait, Lebanon, Philippines, Taiwan and Turkey)

Data Sources:

Data from de Sanjosé S, Eur J Cancer 2013; 49: 3450. This study has gathered the largest international series of vulva cancer cases and precancerous lesions worldwide using a standard protocol with a highly sensitive HPV DNA detection assay.

Figure 65: Comparison of the ten most frequent HPV types in VIN 2/3 cases in Americas and the World



Data updated on 30 Jun 2014 (data as of 30 Jun 2014)

VIN 2/3: Vulvar intraepithelial neoplasia of grade 2/3

[a] Includes cases from Argentina, Brazil, Chile, Colombia, Ecuador, Guatemala, Honduras, Mexico, Paraguay, Uruguay, and Venezuela.

[b] Includes cases from America (Argentina, Brazil, Chile, Colombia, Ecuador, Guatemala, Honduras, Mexico, Paraguay, Uruguay and Venezuela); Oceania (Australia and New Zealand); Europe (Austria, Belarus, Bosnia-Herzegovina, Czech Republic, France, Germany, Greece, Italy, Poland, Portugal, Spain and United Kingdom); and in Asia (Bangladesh, India, Israel, South Korea, Kuwait, Lebanon, Philippines, Taiwan and Turkey)

Data Sources:

Data from de Sanjosé S, Eur J Cancer 2013; 49: 3450. This study has gathered the largest international series of vulva cancer cases and precancerous lesions worldwide using a standard protocol with a highly sensitive HPV DNA detection assay.

4.2.3 Vaginal cancer and precancerous vaginal lesions

Vaginal and cervical cancers share similar risk factors and it is generally accepted that both carcinomas share the same aetiology of HPV infection although there is limited evidence available. Women with vaginal cancer are more likely to have a history of other ano-genital cancers, particularly of the cervix, and these two carcinomas are frequently diagnosed simultaneously. HPV DNA is detected among 78% of invasive vaginal carcinomas and 91% of high-grade vaginal neoplasias (VaIN2/3). HPV16 is the most common type in high-grade vaginal neoplasias and it is detected in at least 78% of HPV-positive carcinomas (de Martel C et al. Lancet Glob Health 2020;8(2):e180-e190; De Vuyst H et al. Int J Cancer 2009; 124:1626-36). In this section, the HPV burden among cases of vaginal cancer cases and precancerous vaginal lesions in United States of America are presented.

Table 29: Studies on HPV prevalence among vaginal cancer cases in United States of America

			HPV Prevalence		
Study[b]	**HPV detection method and targeted HPV types**	**No. Tested**	**%**	**(95% CI)[a]**	**Prevalence of 5 most frequent HPVs, HPV type (%)**
Alemany 2014	PCR-SPF10, EIA, (HPV 6, 11, 16, 18, 26, 30, 31, 33, 35, 39, 42, 45, 51, 52, 53, 56, 58, 59, 66, 67, 68, 69, 73, 82)	191	78	(71.6-83.3)	HPV 16 (42.4), HPV 31 (5.8), HPV 18 (4.2), HPV 33 (4.2), HPV 52 (3.1)

Data updated on 30 Jun 2015 (data as of 30 Jun 2015)

DBH: Dot Blot Hybridization; EIA: Enzyme ImmunoAssay; HC2: Hybrid Capture 2; ISH: In Situ Hybridization; LBA: Line-Blot Assay; LiPA: Line Probe Assay; PCR: Polymerase Chain Reaction; RFLP: Restriction Fragment Length Polymorphism; RLBH: Reverse Line Blot Hybridization; RT-PCR: Real Time Polymerase Chain Reaction; SBH: Southern Blot Hybridization; SPF: Short Primer Fragment; TS: Type Specific;
[a] 95% Confidence Interval
[b] Includes cases from Argentina, Brazil, Chile, Colombia, Ecuador, Guatemala, Mexico, Paraguay, Uruguay, United States of America and Venezuela
Data Sources:
Alemany L, Eur J Cancer 2014; 50: 2846
Based on systematic reviews (up to 2008) performed by ICO for the IARC Monograph on the Evaluation of Carcinogenic Risks to Humans volume 100B and IARC's Infections and Cancer Epidemiology Group. The ICO HPV Information Centre has updated data until June 2015. Reference publications: 1) Bouvard V, Lancet Oncol 2009;10:321 2) De Vuyst H, Int J Cancer 2009;124:1626

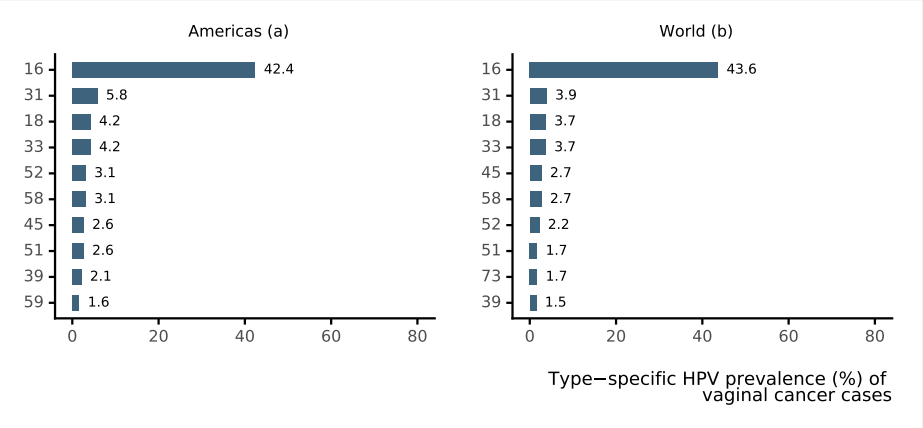
Table 30: Studies on HPV prevalence among VaIN 2/3 cases in United States of America

			HPV Prevalence		
Study	**HPV detection method and targeted HPV types**	**No. Tested**	**%**	**(95% CI)[a]**	**Prevalence of 5 most frequent HPVs, HPV type (%)**
Alemany 2014	PCR-SPF10, EIA, (HPV 6, 11, 16, 18, 26, 30, 31, 33, 35, 39, 42, 45, 51, 52, 53, 56, 58, 59, 66, 67, 68, 69, 73, 82, 89)	80	92.5	(84.6-96.5)	HPV 16 (46.3), HPV 52 (6.3), HPV 73 (6.3), HPV 18 (6.3), HPV 51 (3.8)
Daling 2002	PCR-MY09/11, PCR L1-Consensus primer, RFLP, TS (HPV 16, 31, 33, 35, 58, 66, 73)	99	77.8	(68.6-84.8)	HPV 16 (54.5), HPV 58 (1.0), HPV 66 (1.0), HPV 73 (1.0)
Srodon 2006	PCR-MY09/11, PCR-SPF10, , Sequencing (HPV 6, 11, 16, 18, 20, 21, 22, 23, 26, 30, 31, 32, 33, 34, 35, 38, 39, 40, 42, 43, 44, 45, 51, 52, 53, 54, 56, 57, 58, 59, 60, 61, 62, 66, 67, 68, 69, 70, 71, 72, 73, 74, 80, 81, 82, 83, 84, 85, 86, 87, 89, 90, 91)	16	93.8	(71.7-98.9)	HPV 16 (50.0), HPV 58 (18.8), HPV 31 (12.5), HPV 35 (6.3), HPV 51 (6.3)

Data updated on 30 Jun 2015 (data as of 30 Jun 2015)

DBH: Dot Blot Hybridization; EIA: Enzyme ImmunoAssay; HC2: Hybrid Capture 2; ISH: In Situ Hybridization; LBA: Line-Blot Assay; LiPA: Line Probe Assay; PCR: Polymerase Chain Reaction; RFLP: Restriction Fragment Length Polymorphism; RLBH: Reverse Line Blot Hybridization; RT-PCR: Real Time Polymerase Chain Reaction; SBH: Southern Blot Hybridization; SPF: Short Primer Fragment; TS: Type Specific;
VAIN 2/3: Vaginal intraepithelial neoplasia of grade 2/3
[a] 95% Confidence Interval
Data Sources:
Alemany L, Eur J Cancer 2014; 50: 2846 | Daling JR, Gynecol Oncol 2002; 84: 263 | Srodon M, Am J Surg Pathol 2006; 30: 1513
Based on systematic reviews (up to 2008) performed by ICO for the IARC Monograph on the Evaluation of Carcinogenic Risks to Humans volume 100B and IARC's Infections and Cancer Epidemiology Group. The ICO HPV Information Centre has updated data until June 2015. Reference publications: 1) Bouvard V, Lancet Oncol 2009;10:321 2) De Vuyst H, Int J Cancer 2009;124:1626

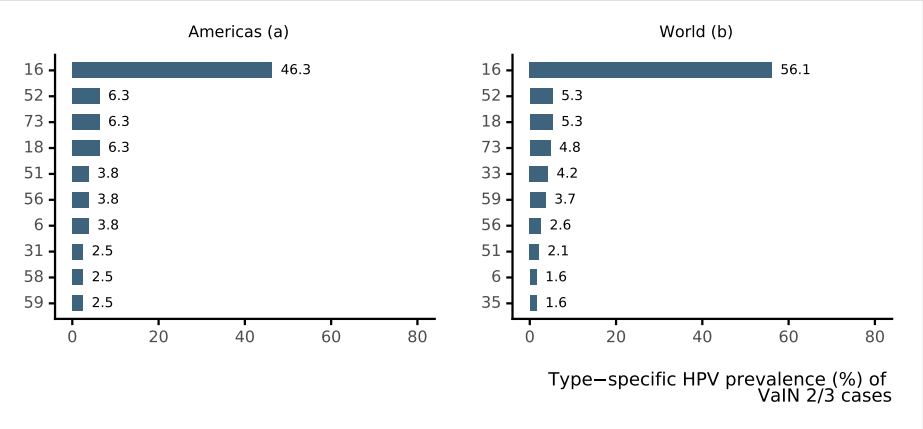
Figure 66: Comparison of the ten most frequent HPV types in cases of vaginal cancer in Americas and the World



Data updated on 30 Jun 2015 (data as of 30 Jun 2015)

[a] Includes cases from Argentina, Brazil, Chile, Colombia, Ecuador, Guatemala, Mexico, Paraguay, Uruguay, United States of America and Venezuela.
[b] Includes cases from Europe (Austria, Belarus, Czech Republic, France, Germany, Greece, Poland, Spain and United Kingdom); America (Argentina, Brazil, Chile, Colombia, Ecuador, Guatemala, Mexico, Paraguay, Uruguay, United states of America and Venezuela); Africa (Mozambique, Nigeria); Asia (Bangladesh, India, Israel, South Korea, Kuwait, Philippines, Taiwan and Turkey); and Oceania (Australia)
Data Sources:
Data from Alemany L, Eur J Cancer 2014; 50: 2846. This study has gathered the largest international series of vaginal cancer cases and precancerous lesions worldwide using a standard protocol with a highly sensitive HPV DNA detection assay.

Figure 67: Comparison of the ten most frequent HPV types in VaIN 2/3 cases in Americas and the World



Data updated on 30 Jun 2014 (data as of 30 Jun 2014)

VAIN 2/3: Vaginal intraepithelial neoplasia of grade 2/3
[a] Includes cases from Argentina, Brazil, Chile, Colombia, Ecuador, Guatemala, Mexico, Paraguay, Uruguay, United States of America and Venezuela.
[b] Includes cases from Europe (Austria, Belarus, Czech Republic, France, Germany, Greece, Poland, Spain and United Kingdom); America (Argentina, Brazil, Chile, Colombia, Ecuador, Guatemala, Mexico, Paraguay, Uruguay, United states of America and Venezuela); Asia (Bangladesh, India, Israel, South Korea, Kuwait, Philippines, Taiwan and Turkey); and Oceania (Australia)
Data Sources:
Data from Alemany L, Eur J Cancer 2014; 50: 2846. This study has gathered the largest international series of vaginal cancer cases and precancerous lesions worldwide using a standard protocol with a highly sensitive HPV DNA detection assay.

4.2.4 Penile cancer and precancerous penile lesions

HPV DNA is detectable in approximately 51% of all penile cancers (de Martel C et al. Lancet Glob Health 2020;8(2):e180-e190). Among HPV-related penile tumours, HPV16 is the most common type detected, followed by HPV18 and HPV types 6/11 (Miralles C et al. J Clin Pathol 2009;62:870-8). Over 95% of invasive penile cancers are SCC and the most common penile SCC histologic sub-types are keratinising (49%), mixed warty-basaloid (17%), verrucous (8%), warty (6%), and basaloid (4%). HPV is commonly detected in basaloid and warty tumours but is less common in keratinising and verrucous tumours. In this section, the HPV burden among cases of penile cancer cases and precancerous penile lesions in United States of America are presented.

Table 31: Studies on HPV prevalence among penile cancer cases in United States of America

Study	HPV detection method and targeted HPV types	HPV Prevalence			
		No. Tested	%	(95% CI)[a]	Prevalence of 5 most frequent HPVs, HPV type (%)
Cupp 1995	PCR L1-Consensus primer, PCR-E6, TS (HPV 16, 18)	42	54.8	(39.9-68.8)	HPV 16 (40.5), HPV 18 (4.8)
Daling 2005	PCR MY09/11	94	79.8	(70.6-86.7)	HPV 16 (69.1), HPV 6 (4.3), HPV 33 (2.1), HPV 18 (1.1), HPV 31 (1.1)
Gregoire 1995[b]	PCR Type specific for: 6,11,16 and 18 + Primers for wide range including 16,18,31,33,35,52	109	23.9	(16.8-32.7)	
Rubin 2001[b]	PCR SPF10 + INO-LIPA	142	42.3	(34.4-50.5)	HPV 16 (25.4), HPV 6 (3.5), HPV 45 (2.8), HPV 52 (2.8), HPV 35 (2.1)
Sarkar 1992	PCR type specific for 6b/11, 16 and 18 + Southern Blot	27	59.3	(40.7-75.5)	
Varma 1991	PCR Type specific for HPV 6/11 and 16 and ISH for 6,11,16,18,31,33 and 35	30	66.7	(48.8-80.8)	

Data updated on 5 Mar 2015 (data as of 30 Jun 2014)

DBH: Dot Blot Hybridization; EIA: Enzyme ImmunoAssay; HC2: Hybrid Capture 2; ISH: In Situ Hybridization; LBA: Line-Blot Assay; LiPA: Line Probe Assay; PCR: Polymerase Chain Reaction; RFLP: Restriction Fragment Length Polymorphism; RLBH: Reverse Line Blot Hybridization; RT-PCR: Real Time Polymerase Chain Reaction; SBH: Southern Blot Hybridization; SPF: Short Primer Fragment; TS: Type Specific;
[a] 95% Confidence Interval
[b] Includes cases from Paraguay and United States of America
Data Sources:
Cupp MR, J Urol 1995; 154: 1024 | Daling JR, Int J Cancer 2005; 116: 606 | Gregoire L, J Natl Cancer Inst 1995; 87: 1705 | Rubin MA, Am J Pathol 2001; 159: 1211 | Sarkar FH, J Urol 1992; 147: 389 | Varma VA, Hum Pathol 1991; 22: 908
The ICO HPV Information Centre has updated data until June 2014. Reference publications (up to 2008): 1) Bouvard V, Lancet Oncol 2009;10:321 2) Miralles-Guri C,J Clin Pathol 2009;62:870

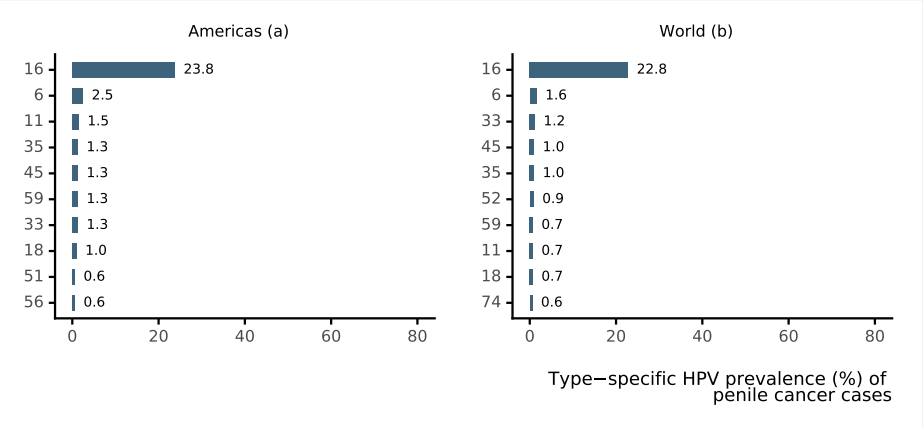
Table 32: Studies on HPV prevalence among PeIN 2/3 cases in United States of America

Study	HPV detection method and targeted HPV types	HPV Prevalence			
		No. Tested	%	(95% CI)[a]	Prevalence of 5 most frequent HPVs, HPV type (%)
Cupp 1995	PCR L1-Consensus primer, PCR-E6, TS (HPV 16, 18)	25	92.0	(75.0-97.8)	HPV 16 (80.0), HPV 18 (8.0)

Data updated on 10 Feb 2015 (data as of 30 Jun 2014)

PeIN 2/3: Penile intraepithelial neoplasia of grade 2/3
DBH: Dot Blot Hybridization; EIA: Enzyme ImmunoAssay; HC2: Hybrid Capture 2; ISH: In Situ Hybridization; LBA: Line-Blot Assay; LiPA: Line Probe Assay; PCR: Polymerase Chain Reaction; RFLP: Restriction Fragment Length Polymorphism; RLBH: Reverse Line Blot Hybridization; RT-PCR: Real Time Polymerase Chain Reaction; SBH: Southern Blot Hybridization; SPF: Short Primer Fragment; TS: Type Specific;
[a] 95% Confidence Interval
Data Sources:
Cupp MR, J Urol 1995; 154: 1024
The ICO HPV Information Centre has updated data until June 2014. Reference publication (up to 2008): Bouvard V, Lancet Oncol 2009;10:321

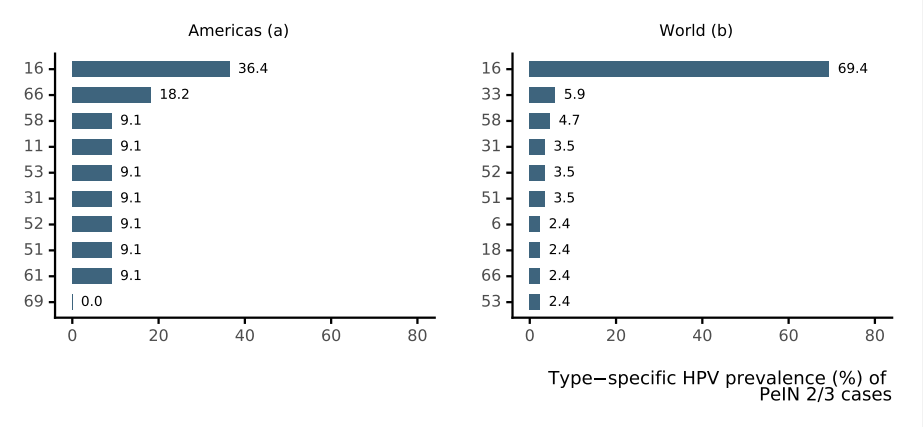
Figure 68: Comparison of the ten most frequent HPV types in cases of penile cancer in Americas and the World



Data updated on 9 Feb 2017 (data as of 30 Jun 2015)

[a] Includes cases from Chile, Colombia, Ecuador, Guatemala, Honduras, Mexico, Paraguay, Venezuela and United States
[b] Includes cases from Australia, Bangladesh, India, South Korea, Lebanon, Philippines, Chile, Colombia, Ecuador, Guatemala, Honduras, Mexico, Paraguay, Venezuela and United States, Mozambique, Nigeria, Senegal, Czech Republic, France, Greece, Poland, Portugal, Spain and United Kingdom.
Data Sources:
Alemany L, Eur Urol 2016; 69: 953

Figure 69: Comparison of the ten most frequent HPV types in PeIN 2/3 cases in Americas and the World



Data updated on 9 Feb 2017 (data as of 30 Jun 2015)

PeIN 2/3: Penile intraepithelial neoplasia of grade 2/3
[a] Includes cases from Chile, Colombia, Ecuador, Guatemala, Honduras, Mexico, Paraguay, Venezuela.
[b] Includes cases from Australia, Bangladesh, India, South Korea, Lebanon, Philippines, Chile, Colombia, Ecuador, Guatemala, Honduras, Mexico, Paraguay, Venezuela, Mozambique, Nigeria, Senegal, Czech Republic, France, Greece, Poland, Portugal, Spain and United Kingdom.
Data Sources:
Chuang AY, Oral Oncol 2008; 44: 915 | Furniss CS, Int J Cancer 2007; 120: 2386 | Ha PK, Clin Cancer Res 2002; 8: 1203 | Harris SL, Head Neck 2011; 33: 1622 | Holladay EB, Am J Clin Pathol 1993; 100: 36 | Hooper JE, Appl Immunohistochem Mol Morphol 2015; 23: 266 | Liang XH, J Oral Maxillofac Surg 2008; 66: 1875 | Lingen MW, Oral Oncol 2013; 49: 1 | Lohavanichbutr P, Arch Otolaryngol Head Neck Surg 2009; 135: 180 | Paz IB, Cancer 1997; 79: 595 | Schlecht NF, Mod Pathol 2011; 24: 1295 | Schwartz SM, J Natl Cancer Inst 1998; 90: 1626 | Smith EM, Int J Cancer 2004; 108: 766 | Walline HM, JAMA Otolaryngol Head Neck Surg 2013; 139: 1320 | Zhao M, Int J Cancer 2005; 117: 605
Based on systematic reviews and meta-analysis performed by ICO. Reference publications: 1) Ndiaye C, Lancet Oncol 2014; 15: 1319 2) Kreimer AR, Cancer Epidemiol Biomarkers Prev 2005; 14: 467

4.3 HPV burden in men

The information to date regarding anogenital HPV infection is primarily derived from cross-sectional studies of selected populations such as general population, university students, military recruits, and studies that examined husbands of control women, as well as from prospective studies. Special sub-groups include mainly studies that examined STD (sexually transmitted diseases) clinic attendees, MSM (men who have sex with men), HIV positive men, and partners of women with HPV lesions, CIN (cervical intraepithelial neoplasia), cervical cancer or cervical carcinoma in situ. Globally, prevalence of external genital HPV infection in men is higher than cervical HPV infection in women, but persistence is less likely. As with genital HPV prevalence, high numbers of sexual partners increase the acquisition of oncogenic HPV infections (Vaccine 2012, Vol. 30, Suppl 5). In this section, the HPV burden among men in United States of America is presented.

Methods

HPV burden in men was based on published systematic reviews and meta-analyses (Dunne EF, J Infect Dis 2006; 194: 1044, Smith JS, J Adolesc Health 2011; 48: 540, Olesen TB, Sex Transm Infect 2014; 90: 455, and Hebnes JB, J Sex Med 2014; 11: 2630) up to October 31, 2015. The search terms for the review were human papillomavirus, men, polymerase chain reaction (PCR), hybrid capture (HC), and viral DNA. References cited in selected articles were also investigated. Inclusion criteria were: HPV DNA detection by means of PCR or HC (ISH if data are not available for the country), and a detailed description of HPV DNA detection and genotyping techniques used. The number of cases tested and HPV positive cases were extracted for each study to estimate the anogenital prevalence of HPV DNA. Binomial 95% confidence intervals were calculated for each anogenital HPV prevalence.

Table 33: Studies on HPV prevalence among men in United States of America

Study	Anatomic sites samples	HPV detection method	Population	Age (years)	No. Tested	HPV Prevalence	
						%	(95% CI)[a]
Giuliano 2008[b]	Corona sulcus, glans, shaft and scrotum	PCR-PGMY09/11	General population	18-44	290	30.0	(24.8-35.6)
Giuliano 2008[c]	Corona sulcus, glans, shaft and scrotum	PCR-PGMY09/11 and GP5/6+	General population and population from University	18-70	416	61.3	(56.4-66.0)
Hernandez 2008	Glans, corona sulcus, penile shaft, scrotum	PCR-PGMY09/11	University population	Mean 29	300	35.3	(29.9-41.0)
Nielson 2007	Glans, corona sulcus, penile shaft and scrotum, perianal area, anus	PCR-PGMY09/11	General population volunteers and STD clinic attendees	18-40	463	65.4	(60.9-69.8)
Nyitray 2011	Anal canal	PCR-PGMY09/11	HIV- MSW from general population and population from University	18-70	1305	12.2	(10.5-14.1)
Nyitray 2011	Anal canal	PCR-PGMY09/11	HIV- MSM from general population and population from University	18-70	176	47.2	(39.6-54.8)
Partridge 2007	Glans, urethral meatus, penile shaft and scrotum	PCR-MY09/11 HMB 01	Heterosexual university students	18-20	240	25.8	(20.4-31.9)
Vardas 2011[d]	Penis	RT-PCR-Multiplex or Biplex	Heterosexual men enrolled in a HPV vaccine trial	Median 20 (15-24)	3132	21.2	(19.8-22.7)
Weaver 2004	Glans, prepuce, shaft, scrotum	PCR-MY09/11 HMB 01	University students	18-25	283	35.0	(29.4-40.9)

Data updated on 31 Oct 2015 (data as of 31 Oct 2015)

HC2: Hybrid Capture 2; ISH: In Situ Hybridization; PCR: Polymerase Chain Reaction; RT-PCR: Real Time Polymerase Chain Reaction; SPF: Short Primer Fragment; TS: Type Specific; MSM: Men who have sex with men; MSW:Men who have sex with women; STD: sexually transmitted diseases

[a] 95% Confidence Interval

[b] Giuliano AR, J Infect Dis 2008; 198: 827
[c] Giuliano AR, Cancer Epidemiol Biomarkers Prev 2008; 17: 2036
[d] Includes cases from Australia, Brazil, Canada, Croatia, Germany, Mexico, Spain, and USA.
Data Sources:
Giuliano AR, J Infect Dis 2008; 198: 827 | Giuliano AR, Cancer Epidemiol Biomarkers Prev 2008; 17: 2036 | Hernandez BY, J Infect Dis 2008; 197: 787 | Nielson CM, Cancer Epidemiol Biomarkers Prev 2007; 16: 1107 | Nyitray AG, J Infect Dis 2011; 203: 49 | Partridge JM, J Infect Dis 2007; 196: 1128 | Vardas E, J Infect Dis 2011; 203: 58 | Weaver BA, J Infect Dis 2004; 189: 677
Based on published systematic reviews, the ICO HPV Information Centre has updated data until October 2015. Reference publications: 1) Dunne EF, J Infect Dis 2006; 194: 1044 2) Smith JS, J Adolesc Health 2011; 48: 540 3) Olesen TB, Sex Transm Infect 2014; 90: 455 4) Hebnes JB, J Sex Med 2014; 11: 2630.

Table 34: Studies on HPV prevalence among men from special subgroups in United States of America

Study	Anatomic sites samples	HPV detection method	Population	Age (years)	No. Tested	HPV Prevalence	
						%	(95% CI)[a]
Baken 1995	Penis	PCR-MY09/11	Heterosexual partners of STD clinic attendees	>17	48	62.5	(47.4-76.0)
Baldwin 2003	Glans, corona, urethra	PCR-PGMY09/11	STD clinic attendees	18-70	393	28.2	(23.8-33.0)
Berry 2009	Anal canal	PCR-MY09/11	HIV+ MSM	26-75	32	90.6	(75.0-98.0)
Berry 2009	Anal canal	PCR-MY09/11	HIV- MSM	26-75	81	56.8	(45.3-67.8)
Caussy 1990	Anus	PCR-TS 6,11,16,18,31,33,35	HIV+ and HIV- homosexual men	Mean 40.6	105	39.0	(29.7-49.1)
Chin-Hong 2004	Anus	PCR-MY09/11	HIV- MSM in EXPLORE cohort	18-89	1218	56.8	(54.0-59.6)
Chin-Hong 2008	Anus	PCR- generic probe set by DBH	HIV- homosexual or bisexual men	24-73	87	57.5	(46.4-68.0)
Chin-Hong 2008	Anus	PCR- generic probe set by DBH	HIV+ homosexual or bisexual men	24-73	38	86.8	(71.9-95.6)
Colón-López 2014	Anus	PCR-MY09/11	STD clinic attendees (29.8% MSM)	>=18	192	57.8	(50.5-64.9)
Conley 2010	Anal canal	PCR-Linear Array	HIV+ MSW	Median 42 (IQR=38-48)	92	58.7	(47.9-68.9)
Conley 2010	Anal canal	PCR-Linear Array	HIV+ MSM	Median 42 (IQR=36-48)	379	95.8	(93.2-97.6)
Critchlow 1998	Anus	PCR-MY09/11	HIV+ homosexual men	Mean 34	322	91.6	(88.0-94.4)
Critchlow 1998	Anus	PCR-MY09/11	HIV- homosexual men	Mean 34	284	66.5	(60.7-72.0)
Fife 2003	Glans, corona, shaft, inguinal skin, scrotum, perineum, perianal, urine	PCR-TS 6,11	STD clinic attendees	18-50	20	10.0	(1.2-31.7)
Friedman 1998	Anal canal	PCR-MY09/11, HMB01, and HC	HIV- MSM	<40 years	46	69.6	(54.2-82.3)
Friedman 1998	Anal canal	PCR-MY09/11, HMB01, and HC	HIV+ MSM	<40 years	135	90.4	(84.1-94.8)
Gandra 2015	Anus	HC2	HIV+ heterosexual men	Median 55 (IQR=49-60)	40	27.5	(14.6-43.9)
Gandra 2015	Anus	HC2	HIV+ MSM	Median 49 (IQR=41-57)	107	54.2	(44.3-63.9)
Goldstone 2011[b]	Penis	RT-PCR-Multiplex or Biplex	HIV- MSM	Median 22 (16-27)	602	18.4	(15.4-21.8)
Goldstone 2011[b]	Anus	RT-PCR-Multiplex or Biplex	HIV- MSM	Median 22 (16-27)	602	42.4	(38.4-46.4)
Hood 2016	Anus	PCR-MY09/11	HIV+ MSM	Mean 39.5 (SD=7.8)	309	92.6	(89.0-95.2)
Kiviat 1993	Anal canal	PCR-MY09/11	HIV- MSM/bisexual men	16-50	152	78.3	(70.9-84.6)
Kiviat 1993	Anal canal	PCR-MY09/11	HIV+ MSM/bisexual men	16-50	241	91.7	(87.5-94.9)

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Table 34 – continued from previous page

Study	Anatomic sites samples	HPV detection method	Population	Age (years)	No. Tested	HPV Prevalence	
						%	(95% CI)[a]
Moscicki 2003	Anus	PCR-MY09/11 and HMB01	High-risk adolescent boys in REACH cohort	13-18	83	44.6	(33.7-55.9)
Nyitray 2011	Anal canal	PCR-PGMY09/11	HIV- MSM from general population and population from University	18-70	176	47.2	(39.6-54.8)
Palefsky 1997	Anus	PCR-MY09/11	HIV+ homosexual or bisexual men	24-66	118	93.2	(87.1-97.0)
Palefsky 1998	Anus	PCR-MY09/11	HIV+ homosexual or bisexual men	24-64	289	93.1	(89.5-95.7)
Palefsky 1998	Anus	PCR-MY09/11	HIV+ and HIV- homosexual or bisexual men	24-73	489	80.0	(76.1-83.4)
Palefsky 1998	Anus	PCR-MY09/11	HIV- homosexual or bisexual men	26-73	200	61.0	(53.9-67.8)
Palefsky 2005	Anal canal	PCR-L1 consensus primers	HIV+ MSM	-	323	95.4	(92.5-97.4)
Wiley 2013	Anus	PCR-PGMY09/11	HIV+ MSM	Mean 55	579	90.7	(88.0-92.9)
Wiley 2013	Anus	PCR-PGMY09/11	HIV- MSM	Mean 55	683	70.3	(66.7-73.7)
Wilkin 2004	Anal canal	HC2	HIV+ MSM	90% > 30 years	55	78.2	(65.0-88.2)

Data updated on 31 Oct 2015 (data as of 31 Oct 2015)

DBH: Dot Blot Hybridization; EIA: Enzyme ImmunoAssay; HC2: Hybrid Capture 2; LiPA: Line Probe Assay; PCR: Polymerase Chain Reaction; RFLP: Restriction Fragment Length Polymorphism; RLH: Reverse Line Hybridisation; RT-PCR: Real Time Polymerase Chain Reaction; SPF: Short Primer Fragment; TS: Type Specific; MSM: Men who have sex with men; MSW:Men who have sex with women; STD: sexually transmitted diseases

[a] 95% Confidence Interval

[b] Includes cases from Australia, Brazil, Canada, Croatia, Germany, Mexico, Spain, and USA.

Data Sources:

Baken LA, J Infect Dis 1995; 171: 429 | Baldwin SB, J Infect Dis 2003; 187: 1064 | Berry JM, Dis Colon Rectum 2009; 52: 239 | Caussy D, Int J Cancer 1990; 46: 214 | Chin-Hong PV, J Infect Dis 2004; 190: 2070 | Chin-Hong PV, Ann Intern Med 2008; 149: 300 | Colón-López V, PLoS ONE 2014; 9: 132 | Conley L, J Infect Dis 2010; 202: 1567 | Critchlow CW, AIDS 1998; 12: 1177 | Fife KH, Sex Transm Dis 2003; 30: 246 | Friedman HB, J Infect Dis 1998; 178: 45 | Gandra S, HIV AIDS Auckl 2015; 7: 29 | Goldstone S, J Infect Dis 2011; 203: 66 | Hood JE, Int J STD AIDS 2016; 27: 353 | Kiviat NB, AIDS 1993; 7: 43 | Moscicki AB, AIDS 2003; 17: 311 | Nyitray AG, J Infect Dis 2011; 203: 49 | Palefsky JM, Genitourin Med 1997; 73: 174 | Palefsky JM, J Infect Dis 1998; 177: 361 | Palefsky JM, AIDS 2005; 19: 1407 | Wiley DJ, PLoS ONE 2013; 8: 131 | Wilkin TJ, J Infect Dis 2004; 190: 1685

Based on published systematic reviews, the ICO HPV Information Centre has updated data until October 2015. Reference publications: 1) Dunne EF, J Infect Dis 2006; 194: 1044 2) Smith JS, J Adolesc Health 2011; 48: 540 3) Olesen TB, Sex Transm Infect 2014; 90: 455 4) Hebnes JB, J Sex Med 2014; 11: 2630.

4.4 HPV burden in the head and neck

The last evaluation of the International Agency for Research in Cancer (IARC) on the carcinogenicity of HPV in humans concluded that (a) there is enough evidence for the carcinogenicity of HPV type 16 in the oral cavity, oropharynx (including tonsil cancer, base of tongue cancer and other oropharyngeal cancer sites), and (b) limited evidence for laryngeal cancer (IARC Monograph Vol 100B). There is increasing evidence that HPV-related oropharyngeal cancers constitute an epidemiological, molecular and clinical distinct form as compared to non HPV-related ones. Some studies indicate that the most likely explanation for the origin of this distinct form of head and neck cancers associated with HPV is a sexually acquired oral HPV infection that is not cleared, persists and evolves into a neoplastic lesion. Around 30% of oropharyngeal cancers (which mainly comprises the tonsils and base of tongue sites) are caused by HPV with HPV16 being the most frequent type (de Martel C et al. Int J Cancer 2017;141(4):664-670). Attributable fraction varies greatly worldwide, being highest in more developed countries (60% in Republic of Korea, 51% in North America, 50% in Eastern Europe, 46% in Japan, 42% in North-Western Europe, 41% in Australia/New Zealand, 24% in South Europe, 23% in China, 22% in India, and 13% in elsewhere) (de Martel C et al. Lancet Glob Health 2020;8(2):e180-e190). In this section, the HPV burden in the head and neck in United States of America is presented.

4.4.1 Burden of oral HPV infection in healthy population

Table 35: Studies on oral HPV prevalence among healthy in United States of America

Study	Specimen collection method / anatomic site	HPV detection method[a]	Population	% males	Age (years)[b]	No. tested[c]	HPV prevalence % (95% CI)	High-Risk HPV prevalence % (95% CI)	5 most frequent HPVs, HPV type (n)[d]
Schwartz 1998	Brush/swab & oral rinse / Oral mucosa	PCR-MY09/11 TS-E6	Age-matched controls	63	18-65	435	9.19 (6.8-12.3)	-	-
Summersgil 2001	Oral rinse / Oral mucosa	PCR-MY09/11 GP5+	Convenient samples from out-patients	40	0-20	268	6 (3.7-9.5)	3.4 (1.8-6.3)	HPV16 (8); X (4); 6 (2); 17 (1); 18 (1)
Winer 2003	Brush / swab / Oral mucosa	PCR-MY09/11 HMB01	General population	0	18-20	318	1.9 (0.9-4.1)	-	HPVX (6)
Smith 2004	Oral rinse / Oral mucosa	PCR-MY09/11 TS-E6	Convenient samples from general population	100	-	68	5.9 (2.3-14.2)	4.4 (1.5-12.2)	HPV31 (2); 13 (1); 39 (1)
Smith 2004	Oral rinse / Oral mucosa	PCR-GP5+/6+ MY09/11	Age-matched controls	59	-	333	18.3 (14.5-22.8)	10.8 (7.9-14.6)	HPV16 (33)
Smith 2007	Oral rinse / Oral mucosa	PCR-MY09/11 GP5+	Convenient samples from out-patients	45	0-20	1235	5.9 (2.3-14.2)	-	-
D'Souza 2009	Oral rinse / Oral mucosa	PCR-PGMY09/11	Convenient samples from general population	100	18-23	210	2.9 (1.3-6.1)	1.9 (0.7-4.8)	HPV16 (1); 35 (1); 39 (1); 51 (1); 66 (1); 84 (1)

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Table 35 – continued from previous page

Study	Specimen collection method / anatomic site	HPV detection method[a]	Population	% males	Age (years)[b]	No. tested[c]	HPV prevalence % (95% CI)	High-Risk HPV prevalence % (95% CI)	5 most frequent HPVs, HPV type (n)[d]
D'Souza 2009	Oral rinse / Oral mucosa	PCR-PGMY09/11	Age-matched controls	76	25-87	332	4.8 (3.0-7.7)	2.1 (1.0-4.3)	HPV62 (3); 58 (2); 6 (1); 11 (1); 16 (1); 42 (1); 51 (1); 52 (1); 56 (1); 58 (1); 59 (1); 61 (1); 62 (1); 66 (1); 68 (1); 73 (1); 83 (1); 89 (1)
Kreimer 2011	Oral rinse / Oral mucosa	PCR-PGMY09/11	Convenient samples from general population	100	18-74	570	4.2 (2.8-6.2)	1.4 (0.7-2.7)	HPV16 (3); 6 (3); 66 (3); 72 (3); 84 (3)
Ragin 2011	Brush/swab & oral rinse / Oral mucosa and tonsil	PCR-PGMY09/11	General population	0	24-78	118	10.2 (5.9-16.9)	2.1 (0.9-4.9)	HPV84 (3); 83 (2); 52 (1); 54 (1); 61 (1); 82 (1); 16 (1); 33 (1); 35 (1); 52 (1); 66 (1); 70 (1)
Pickard 2012	Oral rinse / Oral mucosa	PCR-PGMY09/11	Convenient samples from general population	60	18-30	766	2.6 (1.7-4.0)	-	-
Edelstein 2012	Brush/swab & oral rinse & gargle / Oral mucosa and throat	PCR-PGMY09/11 HMB01	General population	100	18-25	212	7.5 (4.7-11.9)	13.2 (9.3-18.4)	HPV16 (6); 18 (5); 33 (4); 39 (4); 31 (3)
Cook 2014	Oral rinse and gargle / Oral mucosa and throat	PCR-PGMY09/11	Convenient samples from general population	0	18-54	475	2.5 (1.5-4.4)	0.8 (0.3-2.1)	HPVX (7); 16 (2); 51 (1); 59 (1); 84 (1)
Sauter 2015	Brush/swab & oral rinse & gargle / Oral mucosa and throat	PCR-PGMY09/11	Convenient samples from general population	35	0-79	153	2.6 (1.0-6.5)	-	-
Chaturvedi 2015	Oral rinse and gargle / Oral mucosa and throat	PCR-PGMY09/11	General population	51	14-69	9480	6.9 (6.4-7.4)	-	-

Data updated on 19 Oct 2021 (data as of 19 May 2015)

(95% CI): 95% Confidence Interval
[a] TS: type-specific; RT-PCR: real-time PCR; qPCR: quantitative PCR
[b] NS: not specified
[c] number of cases tested for HPV DNA
[d] number of cases positive for the specific HPV-type

Data Sources:
Cook RL, Sex Transm Dis 2014;41(8):486-92 | Chaturvedi AK, Cancer Res 2015;75(12):2468-77 | D'Souza G, J Infect Dis 2009;199(9):1263-9 | D'Souza G, J Infect Dis 2009;199(9):1263-9 | Edelstein ZR, Sex Transm Dis 2012;39(11):860-7 | Kreimer AR, Cancer Epidemiol Biomarkers Prev 2011;20(1):172-82 | Pickard RK, Sex Transm Dis 2012;39(7):559-66 | Ragin C, Int J Mol Sci 2011;12(6):3928-40 | Sauter SL, Cancer Epidemiol Biomarkers Prev 2015;24(5):864-72 | Schwartz SM, J Natl Cancer Inst 1998;90(21):1626-36 | Smith EM, J Natl Cancer Inst 2004;96(6):449-55 | Smith EM, Pediatr Infect Dis J 2007;26(9):836-40 | Smith EM, Sex Transm Dis 2004;31(1):57-62 | Summersgill KF, Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2001;91(1):62-9 | Winer RL, Am J Epidemiol 2003;157(3):218-26
Systematic review and meta-analysis was performed by ICO HPV Information Centre until May 19, 2015. Reference publication: Mena M et al. J Infect Dis 2019;219(10):1574-1585.

4.4.2 HPV burden in head and neck cancers

Table 36: Studies on HPV prevalence among cases of oral cavity cancer in United States of America

Study	HPV detection method and targeted HPV types	HPV Prevalence			
		No. Tested	%	(95% CI)[a]	Prevalence of 5 most frequent HPVs, HPV type (%)
MEN					
Lohavanichbutr 2009	MY09/MY11 (L1) and GP5+/GP6+ (L1) Hybridization with Roche LBA (6. 11. 16. 18. 26. 31. 33. 35. 39. 40. 42. 45. 51. 52. 53. 54. 55. 56. 58. 59. 61. 62. 64. 66. 67. 68. 69. 70. 71. 72. 73. 81. 82. 83. 84. 89)	56	19.6	(11.3-31.8)	-
WOMEN					
Lohavanichbutr 2009	MY09/MY11 (L1) and GP5+/GP6+ (L1) Hybridization with Roche LBA (6. 11. 16. 18. 26. 31. 33. 35. 39. 40. 42. 45. 51. 52. 53. 54. 55. 56. 58. 59. 61. 62. 64. 66. 67. 68. 69. 70. 71. 72. 73. 81. 82. 83. 84. 89)	32	21.9	(11.0-38.8)	-
BOTH OR UNSPECIFIED					
Chuang 2008	RT-PCR E6/E7 for 16 Hybridization with TS probes (16)	21	0	-	-
Furniss 2007	TS-PCR L1 for 16 Amplification with TS primers (16)	150	25.3	(19.0-32.8)	HPV 16 (25.3)
Ha 2002	RT-PCR E6/E7 for 16 Amplification with TS primers (16)	34	2.9	(0.5-14.9)	HPV 16 (2.9)
Harris 2011	MY09/MY11 (L1) and GP5+GP6+ (L1) Sequencing	25	8	(2.2-25.0)	HPV 16 (8.0)
Holladay 1993	L1 consensus primers Hybridization with TS probes (6. 11. 16. 18. 33)	39	17.9	(9.0-32.7)	HPV 16 (17.9) HPV 18 (2.6)
Hooper 2015	HC2, PCR-E6, PCR-E7, PCR-MULTIPLEX (HPV 6, 11, 16, 18, 26, 31, 33, 35, 39, 42, 44, 45, 51, 52, 53, 56, 58, 59, 66, 67, 68, 69, 70, 73, 82)	24	8.3	(2.3-25.8)	-
Liang 2008	GP5+/GP6+ (L1) Amplification with TS primers (16)	51	2	(0.3-10.3)	HPV 16 (2.0)
Lingen 2013[b]	PCR L1-Consensus primer, PCR-SPF10, LiPA (HPV 6, 11, 16, 18, 26, 31, 33, 35, 39, 40, 43, 44, 45, 51, 52, 53, 54, 56, 58, 59, 66, 68, 69, 70, 71, 73, 74, 81)	409	5.9	(4.0-8.6)	-
Lohavanichbutr 2009	MY09/MY11 (L1) and GP5+/GP6+ (L1) Hybridization with Roche LBA (6. 11. 16. 18. 26. 31. 33. 35. 39. 40. 42. 45. 51. 52. 53. 54. 55. 56. 58. 59. 61. 62. 64. 66. 67. 68. 69. 70. 71. 72. 73. 81. 82. 83. 84. 89)	88	20.5	(13.3-30.0)	HPV 16 (18.2) HPV 32 (1.1) HPV 53 (1.1)
Paz 1997	MY09/MY11 (L1) and IU/IWDO (E1) Amplification with TS primers (6. 16. 18)	53	13.2	(6.5-24.8)	HPV 16 (9.4) HPV 6 (1.9) HPV 8 (1.9)
Schlecht 2011	MY09/MY11 (L1) and HMB01 (L1) DBH (40 HPV types including 16. 18. 31. 33. 35. 39. 45. 51. 52. 56. 58. 66)	36	13.9	(6.1-28.7)	HPV 16 (11.1)
Schwartz 1998	MY09/MY11 (L1) and TS-PCR E6 for 6/11/16/18 Hybridization with TS probes (6. 11. 16. 18. 31/33/35)	193	21.2	(16.1-27.5)	HPV 16 (11.4) HPV 6 (6.2) HPV 11 (3.6) HPV 18 (1.0)
Smith 2004	MY09/MY11 (L1) and HMB01 (L1) Sequencing	123	10.6	(6.3-17.2)	HPV 16 (8.1) HPV 33 (2.4)
Walline 2013	PCR-PGMY09/11, PCR L1-Consensus primer, PCR-E6, PCR- MULTIPLEX (HPV 16, 31, 33, 35, 39, 58, 66)	108	25.9	(18.6-34.9)	-
Zhao 2005	RT-PCR E6/E7 for 16 Hybridization with TS probes (16)	38	15.8	(7.4-30.4)	HPV 16 (15.8)

Data updated on 9 May 2016 (data as of 31 Dec 2015)

DBH: Dot Blot Hybridization; EIA: Enzyme ImmunoAssay; HC2: Hybrid Capture 2; ISH: In Situ Hybridization; LBA: Line-Blot Assay; LiPA: Line Probe Assay; PCR: Polymerase Chain Reaction; RFLP: Restriction Fragment Length Polymorphism; RLBH: Reverse Line Blot Hybridization; RT-PCR: Real Time Polymerase Chain Reaction; SBH: Southern Blot Hybridization; SPF: Short Primer Fragment; TS: Type Specific;
Only for European countries
[a] 95% Confidence Interval
[b] Includes cases from Canada and USA
Data Sources:
Chuang AY, Oral Oncol 2008; 44: 915 | Furniss CS, Int J Cancer 2007; 120: 2386 | Ha PK, Clin Cancer Res 2002; 8: 1203 | Harris SL, Head Neck 2011; 33: 1622 | Holladay EB, Am J

Clin Pathol 1993; 100: 36 | Hooper JE, Appl Immunohistochem Mol Morphol 2015; 23: 266 | Liang XH, J Oral Maxillofac Surg 2008; 66: 1875 | Lingen MW, Oral Oncol 2013; 49: 1 | Lohavanichbutr P, Arch Otolaryngol Head Neck Surg 2009; 135: 180 | Paz IB, Cancer 1997; 79: 595 | Schlecht NF, Mod Pathol 2011; 24: 1295 | Schwartz SM, J Natl Cancer Inst 1998; 90: 1626 | Smith EM, Int J Cancer 2004; 108: 766 | Walline HM, JAMA Otolaryngol Head Neck Surg 2013; 139: 1320 | Zhao M, Int J Cancer 2005; 117: 605
Based on systematic reviews and meta-analysis performed by ICO. Reference publications: 1) Ndiaye C, Lancet Oncol 2014; 15: 1319 2) Kreimer AR, Cancer Epidemiol Biomarkers Prev 2005; 14: 467

Table 37: Studies on HPV prevalence among cases of oropharyngeal cancer in United States of America

Study	HPV detection method and targeted HPV types	HPV Prevalence			
		No. Tested	%	(95% CI)[a]	Prevalence of 5 most frequent HPVs, HPV type (%)
MEN					
Chaturvedi 2011	SPF10 (L1) Inno-LiPA (6. 11. 16. 18. 26. 31. 33. 35. 40. 43. 44. 45. 51. 52. 53. 54. 56. 58. 59. 66. 68. 69-71. 70. 73. 74. 82)	210	47.6	(41.0-54.4)	-
Cohen 2008	GP5+/GP6+ (L1) and TS-PCR E7 for 16 Hybridization with TS probes (16)	27	70.4	(51.5-84.1)	HPV 16 (70.4)
Ernster 2007	TS-PCR for 16/18 Amplification with TS primers (16. 18)	51	72.5	(59.1-82.9)	HPV 16 (72.5)
Lohavanichbutr 2009	MY09/MY11 (L1) and GP5+/GP6+ (L1) Hybridization with Roche LBA (6. 11. 16. 18. 26. 31. 33. 35. 39. 40. 42. 45. 51. 52. 53. 54. 55. 56. 58. 59. 61. 62. 64. 66. 67. 68. 69. 70. 71. 72. 73. 81. 82. 83. 84. 89)	28	82.1	(64.4-92.1)	-
Posner 2011	TS-PCR E6/E7 for 16 Amplification with TS primers (16)	89	50.6	(40.4-60.7)	HPV 16 (50.6)
Tezal 2009	TS-PCR E6 for 16/18 Amplification with TS primers (16. 18)	26	76.9	(57.9-89.0)	HPV 16 (76.9)
WOMEN					
Chaturvedi 2011	SPF10 (L1) Inno-LiPA (6. 11. 16. 18. 26. 31. 33. 35. 40. 43. 44. 45. 51. 52. 53. 54. 56. 58. 59. 66. 68. 69-71. 70. 73. 74. 82)	53	30.2	(19.5-43.5)	-
Cohen 2008	GP5+/GP6+ (L1) and TS-PCR E7 for 16 Hybridization with TS probes (16)	8	62.5	(30.6-86.3)	HPV 16 (62.5)
Ernster 2007	TS-PCR for 16/18 Amplification with TS primers (16. 18)	21	61.9	(40.9-79.2)	HPV 16 (61.9)
Lohavanichbutr 2009	MY09/MY11 (L1) and GP5+/GP6+ (L1) Hybridization with Roche LBA (6. 11. 16. 18. 26. 31. 33. 35. 39. 40. 42. 45. 51. 52. 53. 54. 55. 56. 58. 59. 61. 62. 64. 66. 67. 68. 69. 70. 71. 72. 73. 81. 82. 83. 84. 89)	3	0.0	(0.0-56.1)	-
Posner 2011	TS-PCR E6/E7 for 16 Amplification with TS primers (16)	22	50.0	(30.7-69.3)	HPV 16 (50.0)
Tezal 2009	TS-PCR E6 for 16/18 Amplification with TS primers (16. 18)	4	25.0	(4.6-69.9)	HPV 16 (25.0)
BOTH OR UNSPECIFIED					
Agoston 2010	Generic L1 primers from Access Genetics and TS-PCR E7 for 16 RFLP	102	90.2	(82.9-94.6)	HPV 16 (73.5) HPV 58 (1.0)
Chaturvedi 2011	SPF10 (L1) Inno-LiPA (6. 11. 16. 18. 26. 31. 33. 35. 40. 43. 44. 45. 51. 52. 53. 54. 56. 58. 59. 66. 68. 69-71. 70. 73. 74. 82)	263	44.1	(38.2-50.1)	HPV 16 (38.8) HPV 35 (1.5) HPV 33 (1.1) HPV 58 (1.1) HPV 18 (0.8)
Cohen 2008	GP5+/GP6+ (L1) and TS-PCR E7 for 16 Hybridization with TS probes (16)	35	68.6	(52.0-81.4)	HPV 16 (68.6)
D'Souza 2007	MY09/MY11 (L1) Hybridization with Roche LBA (6. 11. 16. 18. 26. 31. 33. 35. 39. 40. 42. 45. 51. 52. 53. 54. 55. 56. 58. 59. 61. 62. 64. 66. 67. 68. 69. 70. 71. 72. 73. 81. 82. 83. 84. 89)	60	63.3	(50.7-74.4)	HPV 16 (58.3) HPV 33 (6.7) HPV 35 (1.7)
Ernster 2007	TS-PCR for 16/18 Amplification with TS primers (16. 18)	72	69.4	(58.0-78.9)	HPV 16 (69.4)
Furniss 2007	TS-PCR L1 for 16 Amplification with TS primers (16)	43	34.9	(22.4-49.8)	HPV 16 (34.9)
Kingma 2010	PGMY09/11 (L1) Inno-LiPA (6. 11. 16. 18. 26. 31. 33. 35. 40. 43. 44. 45. 51. 52. 53. 54. 56. 58. 59. 66. 68. 69-71. 70. 73. 74. 82)	61	86.9	(76.2-93.2)	HPV 16 (67.2) HPV 18 (14.8) HPV 33 (4.9) HPV 45 (1.6) HPV 82 (1.6)
Kong 2009	GP5+/GP6+ (L1) and TS-PCR Sequencing	49	67.3	(53.4-78.8)	HPV 16 (65.3) HPV 18 (2.0) HPV 33 (2.0)

Continued on next page

Table 37 – continued from previous page

Study	HPV detection method and targeted HPV types	No. Tested	%	(95% CI)[a]	Prevalence of 5 most frequent HPVs, HPV type (%)
Lohavanichbutr 2009	MY09/MY11 (L1) and GP5+/GP6+ (L1) Hybridization with Roche LBA (6. 11. 16. 18. 26. 31. 33. 35. 39. 40. 42. 45. 51. 52. 53. 54. 55. 56. 58. 59. 61. 62. 64. 66. 67. 68. 69. 70. 71. 72. 73. 81. 82. 83. 84. 89)	31	74.2	(56.8-86.3)	HPV 16 (67.7) HPV 35 (3.2) HPV 45 (3.2)
Posner 2011	TS-PCR E6/E7 for 16 Amplification with TS primers (16)	111	50.5	(41.3-59.6)	HPV 16 (50.5)
Schlecht 2011	MY09/MY11 (L1) and HMB01 (L1) DBH (40 HPV types including 16. 18. 31. 33. 35. 39. 45. 51. 52. 56. 58. 66)	30	50.0	(33.2-66.8)	HPV 16 (43.3) HPV 35 (3.3)
Schwartz 1998	MY09/MY11 (L1) and TS-PCR E6 for 6/11/16/18 Hybridization with TS probes (6. 11. 16. 18. 31/33/35)	55	41.8	(29.7-55.0)	HPV 16 (34.5) HPV 6 (12.7) HPV 11 (3.6)
Smith 2004	MY09/MY11 (L1) and HMB01 (L1) Sequencing	62	40.3	(29.0-52.7)	HPV 16 (37.1) HPV 18 (1.6) HPV 33 (1.6)
Strome 2002	MY09/MY11 (L1) and TS-PCR E6 for 6/11/16/18 Sequencing	52	46.2	(33.3-59.5)	HPV 16 (40.4) HPV 12 (3.8) HPV 59 (1.9)
Tezal 2009	TS-PCR E6 for 16/18 Amplification with TS primers (16. 18)	30	70.0	(52.1-83.3)	HPV 16 (70.0)
Zhao 2005	RT-PCR E6/E7 for 16 Hybridization with TS probes (16)	26	57.7	(38.9-74.5)	HPV 16 (57.7)

Data updated on 9 May 2016 (data as of 31 Dec 2015)

DBH: Dot Blot Hybridization; EIA: Enzyme ImmunoAssay; HC2: Hybrid Capture 2; ISH: In Situ Hybridization; LBA: Line-Blot Assay; LiPA: Line Probe Assay; PCR: Polymerase Chain Reaction; RFLP: Restriction Fragment Length Polymorphism; RLBH: Reverse Line Blot Hybridization; RT-PCR: Real Time Polymerase Chain Reaction; SBH: Southern Blot Hybridization; SPF: Short Primer Fragment; TS: Type Specific
Only for European countries
[a] 95% Confidence Interval
Data Sources:
Agoston ES, Am J Clin Pathol 2010; 134: 36 | Chaturvedi AK, J Clin Oncol 2011; 29: 4294 | Cohen MA, Acta Otolaryngol 2008; 128: 583 | D'Souza G, N Engl J Med 2007; 356: 1944 | Ernster JA, Laryngoscope 2007; 117: 2115 | Furniss CS, Int J Cancer 2007; 120: 2386 | Kingma DW, Anticancer Res 2010; 30: 5099 | Kong CS, Int J Radiat Oncol Biol Phys 2009; 74: 553 | Lohavanichbutr P, Arch Otolaryngol Head Neck Surg 2009; 135: 180 | Posner MR, Ann Oncol 2011; 22: 1071 | Schlecht NF, Mod Pathol 2011; 24: 1295 | Schwartz SM, J Natl Cancer Inst 1998; 90: 1626 | Smith EM, Int J Cancer 2004; 108: 766 | Strome SE, Clin Cancer Res 2002; 8: 1093 | Tezal M, Arch Otolaryngol Head Neck Surg 2009; 135: 391 | Zhao M, Int J Cancer 2005; 117: 605
Based on systematic reviews and meta-analysis performed by ICO. Reference publications: 1) Ndiaye C, Lancet Oncol 2014; 15: 1319 2) Kreimer AR, Cancer Epidemiol Biomarkers Prev 2005; 14: 467

Table 38: Studies on HPV prevalence among cases of hypopharyngeal or laryngeal cancer in United States of America

Study	HPV detection method and targeted HPV types	HPV Prevalence: No. Tested	HPV Prevalence: %	HPV Prevalence: (95% CI)[a]	HPV Prevalence: Prevalence of 5 most frequent HPVs, HPV type (%)
MEN					
No data available	-	-	-	-	-
WOMEN					
No data available	-	-	-	-	-
BOTH OR UNSPECIFIED					
Brandwein 1993	Perkin Census L1 consensus primers Hybridization with TS probes (6. 11. 16. 18. 31. 35. 51)	40	7.5	(2.6-19.9)	HPV 16 (2.5)
Chernock 2013	PCR L1-Consensus primer, PCR-SPF10, LiPA (HPV 16, 18, 31, 33, 35, 39, 45, 51, 52, 53, 56, 58, 59, 66, 68)	76	17.1	(10.3-27.1)	HPV 16 (13.2) HPV 31 (10.5) HPV 53 (9.2)
Furniss 2007	TS-PCR L1 for 16 Amplification with TS primers (16)	63	31.7	(21.6-44.0)	HPV 16 (31.7)
Paz 1997	MY09/MY11 (L1) and IU/IWDO (E1) Amplification with TS primers (6. 16. 18)	43	4.7	(1.3-15.5)	HPV 16 (2.3)
Schlecht 2011	MY09/MY11 (L1) and HMB01 (L1) DBH (40 HPV types including 16. 18. 31. 33. 35. 39. 45. 51. 52. 56. 58. 66)	40	27.5	(16.1-42.8)	HPV 16 (27.5)
Shen 1996	MY09/MY11 (L1) and TS-PCR E7 for 16/18 RFLP*	32	9.4	(3.2-24.2)	HPV 11 (3.1) HPV 18 (3.1) HPV 6 (3.1)
Zhao 2005	RT-PCR E6/E7 for 16 Hybridization with TS probes (16)	22	18.2	(7.3-38.5)	HPV 16 (18.2)

Data updated on 9 May 2016 (data as of 31 Dec 2015)

DBH: Dot Blot Hybridization; EIA: Enzyme ImmunoAssay; HC2: Hybrid Capture 2; ISH: In Situ Hybridization; LBA: Line-Blot Assay; LiPA: Line Probe Assay; PCR: Polymerase Chain Reaction; RFLP: Restriction Fragment Length Polymorphism; RLBH: Reverse Line Blot Hybridization; RT-PCR: Real Time Polymerase Chain Reaction; SBH: Southern Blot Hybridization; SPF: Short Primer Fragment; TS: Type Specific

Only for European countries
[a] 95% Confidence Interval
Data Sources:
Brandwein MS, Ann Otol Rhinol Laryngol 1993; 102: 309 | Chernock RD, Mod Pathol 2013; 26: 223 | Furniss CS, Int J Cancer 2007; 120: 2386 | Paz IB, Cancer 1997; 79: 595 | Schlecht NF, Mod Pathol 2011; 24: 1295 | Shen J, Mod Pathol 1996; 9: 15 | Zhao M, Int J Cancer 2005; 117: 605
Based on systematic reviews and meta-analysis performed by ICO. Reference publications: 1) Ndiaye C, Lancet Oncol 2014; 15: 1319 2) Kreimer AR, Cancer Epidemiol Biomarkers Prev 2005; 14: 467

5 Factors contributing to cervical cancer

HPV is a necessary cause of cervical cancer, but it is not a sufficient cause. Other cofactors are necessary for progression from cervical HPV infection to cancer. Tobacco smoking, high parity, long-term hormonal contraceptive use, and co-infection with HIV have been identified as established cofactors. Co-infection with Chlamydia trachomatis and herpes simplex virus type-2, immunosuppression, and certain dietary deficiencies are other probable cofactors. Genetic and immunological host factors and viral factors other than type, such as variants of type, viral load and viral integration, are likely to be important but have not been clearly identified. (Muñoz N, Vaccine 2006; 24(S3): 1-10). In this section, the prevalence of smoking, parity (fertility), oral contraceptive use, and HIV in United States of America are presented.

Table 39: Factors contributing to cervical carcinogenesis (cofactors) in United States of America

INDICATOR		MALE	FEMALE	TOTAL
Smoking				
Smoking of any tobacco adjusted prevalence (%) [95% UI]	Current[a]	23.8 [19.2-29.9]	18.1 [14.2-22.2]	20.9 [16.7-26]
	Daily[b]	17 [9.7-24.2]	13 [6.9-18.5]	15 [8.3-21.3]
Cigarette smoking adjusted prevalence (%) [95% UI]	Current[c]	23.8 [19.2-29.9]	18.1 [14.2-22.2]	20.9 [16.7-26]
	Daily[d]	17 [9.7-24.2]	13 [6.9-18.5]	15 [8.3-21.3]
Parity				
Total fertility rate per woman		-	1.9	-
Age-specific fertility rate (per 1000 women)	15-19 yrs	-	-	-
	20-24 yrs	-	-	-
	25-29 yrs	-	-	-
	30-34 yrs	-	-	-
	35-39 yrs	-	-	-
	40-44 yrs	-	-	-
	45-49 yrs	-	-	-
Hormonal contraception				
Oral contraceptive use (%) among women who are married or in union		-	11.4	-
Injectable contraception use (%) among women who are married or in union		-	1.40	-
Implant contraceptive use (%) among women who are married or in union		-	2.03	-
HIV				
Estimated percent of adults aged 15-49 who are living with HIV [95% UI]		- [—]	- [—]	- [—]
Estimated percent of young adults aged 15-24 who are living with HIV [95% UI]		- [—]	- [—]	- [—]
HIV prevalence (%) among sex workers		-	-	-
HIV prevalence (%) among men who have sex with men[1]		14.5	-	14.5
Estimated number of people living with HIV [95% UI]		-	-	- [—]
Estimated number of adults (15+ yrs) living with HIV [95% UI]		- [—]	- [—]	- [—]
Estimated number of AIDS-related deaths [95% UI]		-	-	- [—]

Data accessed on 12 Nov 2019

Crude adjusted prevalence (%) estimates of tabacco use among people aged >= 15 years by country, for the year 2016.

[a] "Current" means smoking at the time of the survey, including both daily and non-daily or occasional smoking. "Tobacco smoking" means smoking any form of tobacco, including cigarettes, cigars, pipes, or any other smoked tobacco products and excluding smokeless products.

[b] "Daily" means smoking every day at the time of the survey. "Tobacco smoking" means smoking any form of tobacco, including cigarettes, cigars, pipes, or any other smoked tobacco products and excluding smokeless products.

[c] "Current" means smoking at the time of the survey, including both daily and non-daily or occasional smoking.

[d] "Daily" means smoking every day at the time of the survey.

Year of estimate: 2016

Data Sources:

WHO global report on trends in prevalence of tobacco use 2000–2025, third edition. Geneva: World Health Organization; 2019. Available at https://www.who.int/publications/i/item/who-global-report-on-trends-in-prevalence-of-tobacco-use-2000-2025-third-edition

United Nations, Department of Economic and Social Affairs, Population Division (2019). World Contraceptive Use 2019 (POP/DB/CP/Rev2019). https://www.un.org/en/development/desa/population/publications/dataset/contraception/wcu2019.asp. Available at: [Accessed on November 18, 2019].

UNAIDS database [internet]. Available at: http://aidsinfo.unaids.org/ [Accessed on November 21, 2019]

[1] Numerator: HIV prevalence was estimated from cumulative HIV incidence using an extended back-calculation model (using both HIV and AIDS data, the time of first diagnosis with HIV, and disease severity at diagnosis) and estimated cumulative deaths. The data can be accessed at: http://www.cdc.gov/hiv/pdf/surveillance_Report_vol_19_no_3.pdf. Denominator: The estimated MSM population was derived from seven nationally representative surveys that provide data on same-sex behavior. Data were pooled for three recall periods and combined using meta-analytic procedures. The proportion of men reporting same sex behavior in the past five years was applied to U.S. census data to produce a population size estimate. A report describing these data can be found at: Purcell DW, Johnson C, Lansky A, Prejean J. Stein R, Denning P, Gaul Z, Weinstock H, Su J, Crepaz, N. Estimating the population size of men who have sex with men in the United States to obtain HIV and syphilis rates. Open AIDS Journal 2012; 6(Suppl 1:M6):98-107.

6 Sexual and reproductive health behaviour indicators

Sexual intercourse is the primary route of transmission of genital HPV infection. Information about sexual and reproductive health behaviours is essential to the design of effective preventive strategies against anogenital cancers. In this section, we describe sexual and reproductive health indicators that may be used as proxy measures of risk for HPV infection and anogenital cancers. Several studies have reported that earlier sexual debut is a risk factor for HPV infection, although the reason for this relationship is still unclear. In this section, information on sexual and reproductive health behaviour in United States of America are presented.

Table 40: Percentage of 15-year-olds who have had sexual intercourse in United States of America

Indicator	Male	Female
Percentage of 15-year-old subjects who report sexual intercourse	18.0	13.0

Data accessed on 16 Mar 2017
Please refer to original source for methods of estimation
Percentage of all 15- to 19-year-olds who report having had sex before the age of 15 years.
Year of estimation: 2011-2013
Data Sources:
CDC/NCHS, National Survey of Family Growth, 2011–2013. Sexual Activity, Contraceptive Use, and Childbearing of Teenagers Aged 15–19 in the United States. NCHS Data Brief No. 209, July 2015. Martinez G, Abma J. Available at: https://www.cdc.gov/nchs/products/databriefs/db209.htm

Table 41: Median age at first sex in United States of America

Study	Year/period	Birth cohort N	MALE N	MALE Median age at first sex	FEMALE N	FEMALE Median age at first sex	TOTAL N	TOTAL Median age at first sex
USA 2011-2013 National Survey of Family Growth	2011-2013	-	-	16.8	-	17.2	-	-

Data accessed on 16 Mar 2017
Please refer to original source for methods of estimation
Mean age at first sexual intercourse after menarche for women aged 15-44; Mean age at first sexual intercourse for men aged 15-44.
Data Sources:
Centers for disease control and prevention (CDC):National Center for health statistics. Key Statistics from the National Survey of Family Growth. Accessed on March 16 2017. Available at: https://www.cdc.gov/nchs/nsfg/key_statistics/s.htm#sexualactivity

Table 42: Marriage patterns in United States of America

Indicator		Male	Female
Average age at first marriage[1]		28.8	26.9
Age-specific % of ever married[2]	15-19 years	1.11	2.09
	20-24 years	11.61	19.91
	25-29 years	38.88	50.9
	30-34 years	63.78	72.35
	35-39 years	75.88	81.4
	40-44 years	80.89	85.38
	45-49 years	84.26	88.03
	50-54 years	87.32	89.98
	55-59 years	90.75	92.06
	60-64 years	93.27	93.73
	65-69 years	95.47	95.47
	70-74 years	-	-
	+75	-	-

Data accessed on 20 Feb 2020

Please refer to original source for methods of estimation.

[a] 2010 Census

[b] US Census Bureau

Data Sources:

[1] The world bank: health nutrition and population statistics. Updated 20-Dec-2019. Accessed on February 20 2020. Available at http://data.worldbank.org/data-catalog/health-nutrition-and-population-statistics

[2] United Nations, Department of Economic and Social Affairs, Population Division (2019). World Marriage Data 2019 (POP/DB/Marr/Rev2019). Available at: https://population.un.org/MarriageData/Index.html#/home Accessed on February 24, 2020.

Table 43: Average number of sexual partners in United States of America

Study	Period of estimate	Year/Period	Birth cohort	Male Mean(N)	Female Mean(N)	Total Mean(N)
-	-	-	-	-(-)	-(-)	-(-)

Data accessed on 8 Aug 2013

Please refer to original source for methods of estimation

Table 44: Lifetime prevalence of anal intercourse among women in United States of America

			FEMALE		
Study	**Year/Period**	**Birth cohort**	**N surveyed**	**N sexual active**	**% among sexually active**
-	-	-	-	-	-

Data accessed on 8 Aug 2013
Please refer to original source for methods of estimation

7 HPV preventive strategies

It is established that well-organised cervical screening programmes or widespread good quality cytology can reduce cervical cancer incidence and mortality. The introduction of HPV vaccination could also effectively reduce the burden of cervical cancer in the coming decades. This section presents indicators on basic characteristics and performance of cervical cancer screening, status of HPV vaccine licensure and introduction in United States of America.

7.1 Cervical cancer screening practices

Screening strategies differ between countries. Some countries have population-based programmes, where in each round of screening women in the target population are individually identified and invited to attend screening. This type of programme can be implemented nationwide or only in specific regions of the country. In opportunistic screening, invitations depend on the individual's decision or on encounters with health-care providers. The most frequent method for cervical cancer screening is cytology, and there are alternative methods such as HPV DNA tests and visual inspection with acetic acid (VIA). VIA is an alternative to cytology-based screening in low-resource settings (the 'see and treat' approach). HPV DNA testing is being introduced into some countries as an adjunct to cytology screening ('co-testing') or as the primary screening test to be followed by a secondary, more specific test, such as cytology.

Table 45: Main characteristics of cervical cancer screening in United States of America

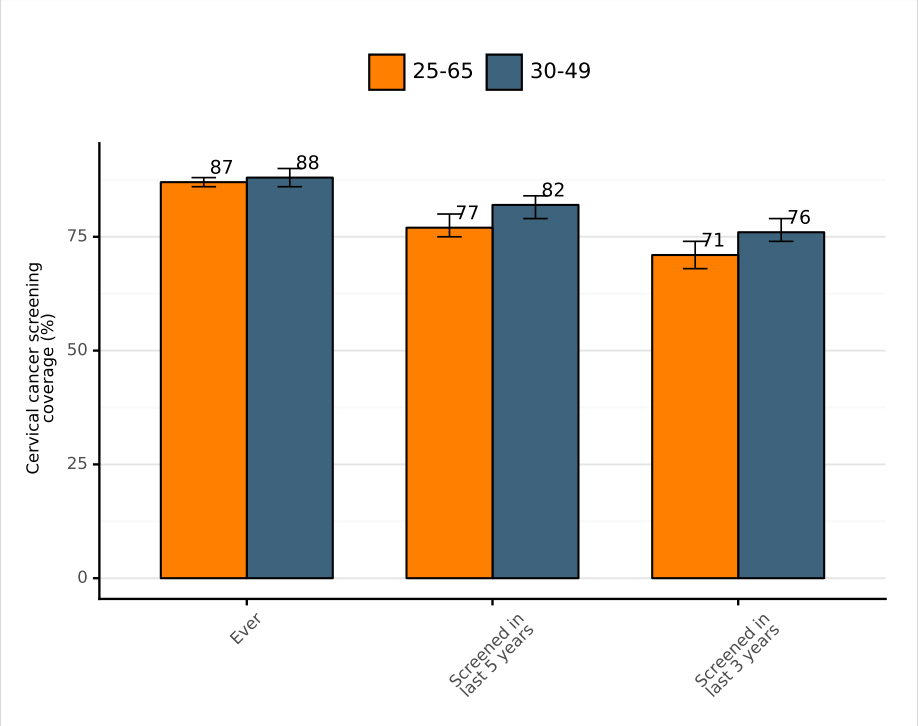
Region	Existence of official national recommendations	Starting year of current recommendations	Active invitation to screening	Screening ages (years), primary screening test used, and screening interval or frequency of screenings
United States of America	Yes	2018	No	21-29 (cytology, 3 years); 30-65 (cytology, 3 years); 30-65 (HPV test, 5 years); 30-65 (cytology OR HPV test, 5 years)

Data accessed on 31 Aug 2022

Data Sources:

Bruni L, Serrano B, Roura E, Alemany L, Cowan M, Herrero R, et al. Cervical cancer screening programmes and age-specific coverage estimates for 202 countries and territories worldwide: a review and synthetic analysis. Lancet Glob Health. 2022;10(8):e1115.

Figure 70: Estimated coverage* of cervical cancer screening in United States of America



Data accessed on 31 Aug 2022

* Estimated coverage and 95% confidence interval in 2019

Data Sources:

Bruni L, Serrano B, Roura E, Alemany L, Cowan M, Herrero R, et al. Cervical cancer screening programmes and age-specific coverage estimates for 202 countries and territories worldwide: a review and synthetic analysis. Lancet Glob Health. 2022;10(8):e1115.

7.2 HPV vaccination

Table 46: National HPV Immunization programme in United States of America

	Female	Male
HPV vaccination programme	Introduced	Introduced
Year of introduction	2006	2011
Year of estimation of HPV vaccination coverage	2021	2021
HPV coverage – first dose (%)	71	68
HPV coverage – last dose (%)	48	43

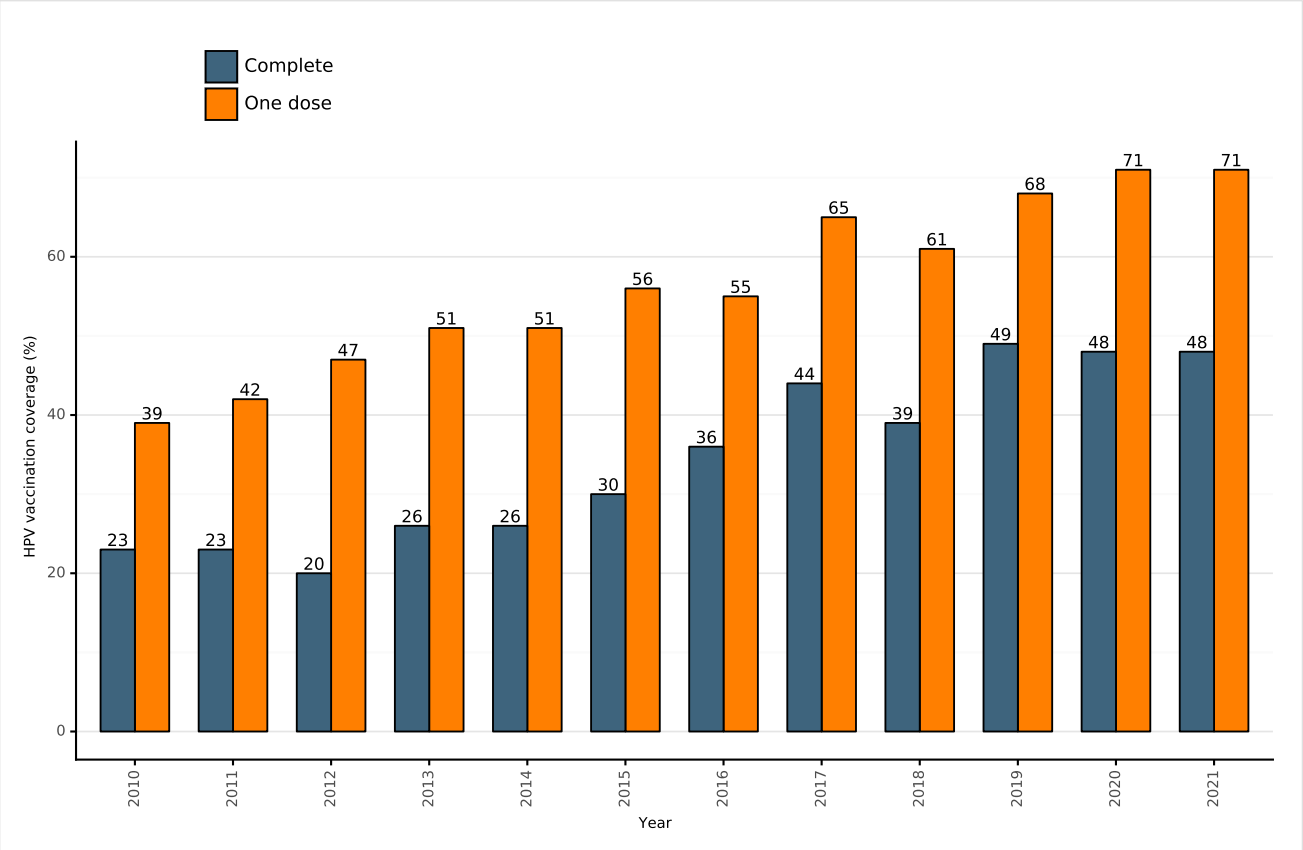
Data accessed on 24 Oct 2022

Data Sources:

Human papillomavirus (HPV) vaccination coverage. World Health Organization. 2022. Available from: https://immunizationdata.who.int/pages/coverage/hpv.html, accessed [24 Oct 2022]

Bruni L, Saura-Lázaro A, Montoliu A, Brotons M, Alemany L, Diallo MS, et al. HPV vaccination introduction worldwide and WHO and UNICEF estimates of national HPV immunization coverage 2010-2019. Prev Med. 2021;144(106399):106399.

Figure 71: HPV vaccination coverage in females by year in United States of America



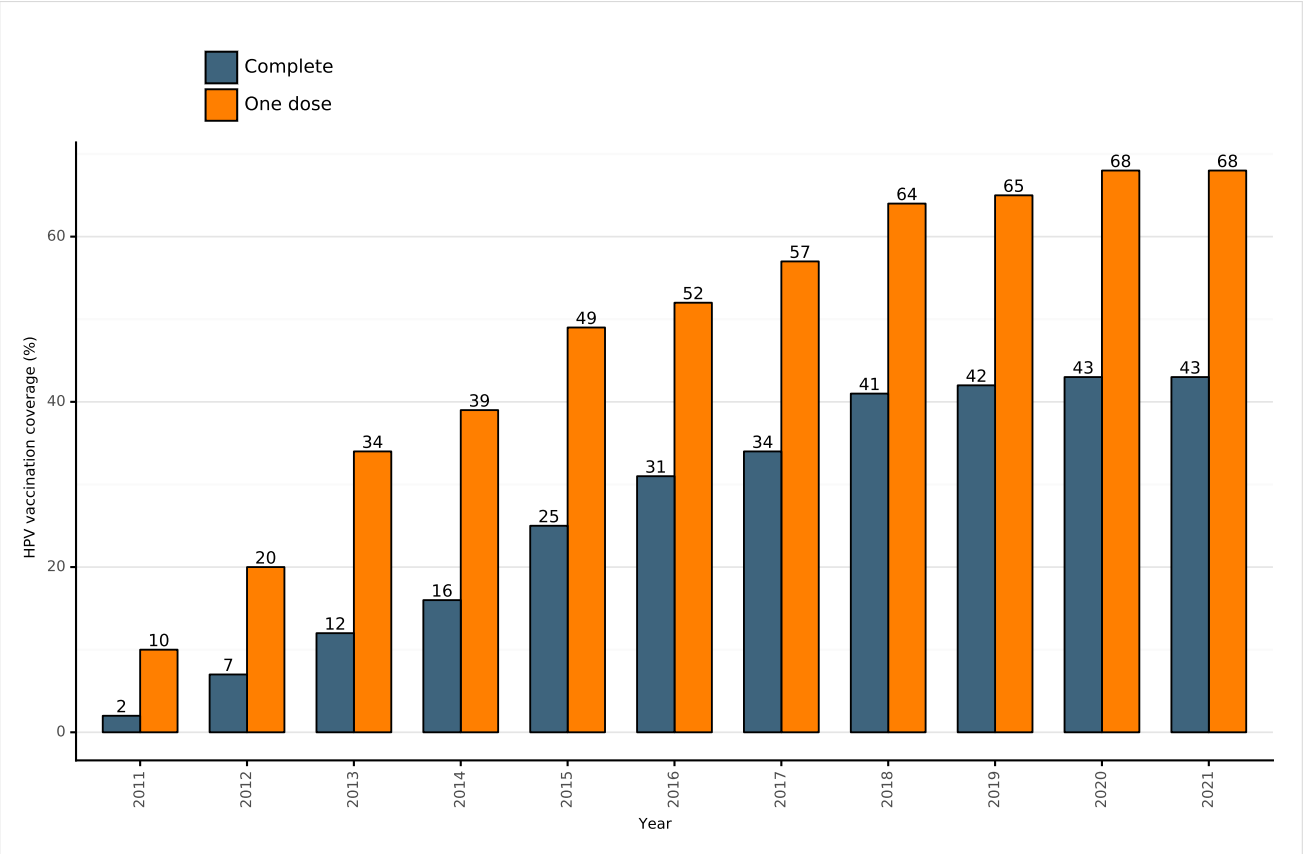
Data accessed on 24 Oct 2022

Data Sources:

Human papillomavirus (HPV) vaccination coverage. World Health Organization. 2022. Available from: https://immunizationdata.who.int/pages/coverage/hpv.html, accessed [24 Oct 2022]

Bruni L, Saura-Lázaro A, Montoliu A, Brotons M, Alemany L, Diallo MS, et al. HPV vaccination introduction worldwide and WHO and UNICEF estimates of national HPV immunization coverage 2010-2019. Prev Med. 2021;144(106399):106399.

Figure 72: HPV vaccination coverage in males by year in United States of America



Data accessed on 24 Oct 2022

Data Sources:

Human papillomavirus (HPV) vaccination coverage. World Health Organization. 2022. Available from: https://immunizationdata.who.int/pages/coverage/hpv.html, accessed [24 Oct 2022]

Bruni L, Saura-Lázaro A, Montoliu A, Brotons M, Alemany L, Diallo MS, et al. HPV vaccination introduction worldwide and WHO and UNICEF estimates of national HPV immunization coverage 2010-2019. Prev Med. 2021;144(106399):106399.

8 Protective factors for cervical cancer

Male circumcision and the use of condoms have shown a significant protective effect against HPV transmission.

Table 47: Prevalence of male circumcision in United States of America

Reference	Prevalence % (95% CI)	Methods
Cook 1994	80.5 (79.0-82.0)	N=2,776: STD Clinics patients
Baldwin 2004	67.4 (62.2-72.4)	N=344: STD Clinics patients
Weaver 2004	82.1 (77.1-86.4)	N=279: Undergraduate students
Nelson 2005	54.4	N=4,657,402: Overall weighted prevalence, male newborn hospitalizations from 1988-2000
Partridge 2007	77.0 (71.1-82.2)	N=239: Male university students
Nielson 2007	84.2 (80.5-87.4)	N=461: General population volunteers and STD clinic attendees
Mckinney 2008	56.1 (51.0-61.2)	N=661: Data from the Population-based cross-sectional survey NYC (Health and Nutrition Examination survey HANES 2004)
Mckinney 2008	61.4 (60.7-62.1)	N=17,187: Male patients born before 1985 and who received a physical examination at a STD clinic in 2006
Hernandez 2008	77.3 (72.2-81.9)	N=300: University population, primarily heterosexual adult males
Lu 2009	87.7 (83.3-91.3)	N=285: General population residents of southern Arizona
Ryan 2015	86.1 (81.1-90.2)	N=244: Psoriasis patients between 2010 and 2012
Giuliano 2008	83.2 (79.2-86.6)	N=416: General population and population from University
WHO 2007	20-80	Data from Demographic and Health Surveys (DHS) and other publications to categorize the country-wide prevalence of male circumcision as <20%, 20-80%, or >80%.

Data accessed on 31 Aug 2015

Please refer to country-specific reference(s) for full methodologies.

Data Sources:

Baldwin SB, Sex Transm Dis 2004; 31: 601 | Cook LS, Am J Public Health 1994; 84: 197 | Giuliano AR, Cancer Epidemiol Biomarkers Prev 2008; 17: 2036 | Hernandez BY, J Infect Dis 2008; 197: 787 | Lu B, J Infect Dis 2009; 199: 362 | McKinney CM, Sex Transm Dis 2008; 35: 814 | Nelson CP, J Urol 2005; 173: 978 | Nielson CM, Cancer Epidemiol Biomarkers Prev 2007; 16: 1107 | Partridge JM, J Infect Dis 2007; 196: 1128 | Ryan C, J Am Acad Dermatol 2015; 72: 978 | Weaver BA, J Infect Dis 2004; 189: 677 | WHO 2007: Male circumcision: Global trends and determinants of prevalence, safety and acceptability

Based on systematic reviews and meta-analysis performed by ICO. The ICO HPV Information Centre has updated data until August 2015. Reference publication: Albero G, Sex Transm Dis. 2012 Feb;39(2):104-13.

Table 48: Prevalence of condom use in United States of America

Indicator	Age range	Year of estimate	Prevalence %[a]
Condom use	15-49	2015-2017	12.6685497349967

Data accessed on 18 Nov 2019

Please refer to original source for methods of estimation.

[a] Condom use: Proportion of male partners who are using condoms with their female partners of reproductive age to whom they are married or in union by country.

Data Sources:

2015-2017 NSFG

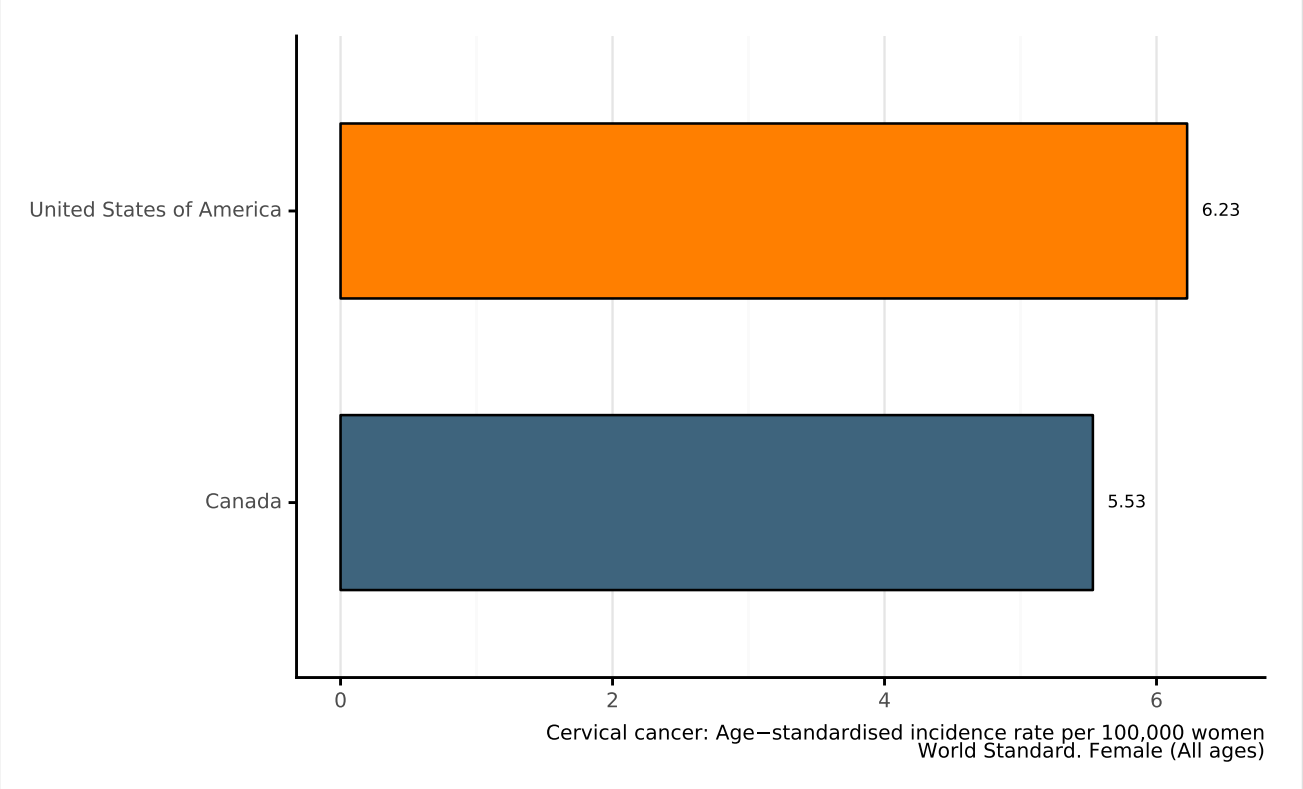
United Nations, Department of Economic and Social Affairs, Population Division (2019). World Contraceptive Use 2019 (POP/DB/CP/Rev2019). https://www.un.org/en/development/desa/population/publications/dataset/contraception/wcu2019.asp. Available at: [Accessed on November 18, 2019].

9 Annex

9.1 Incidence

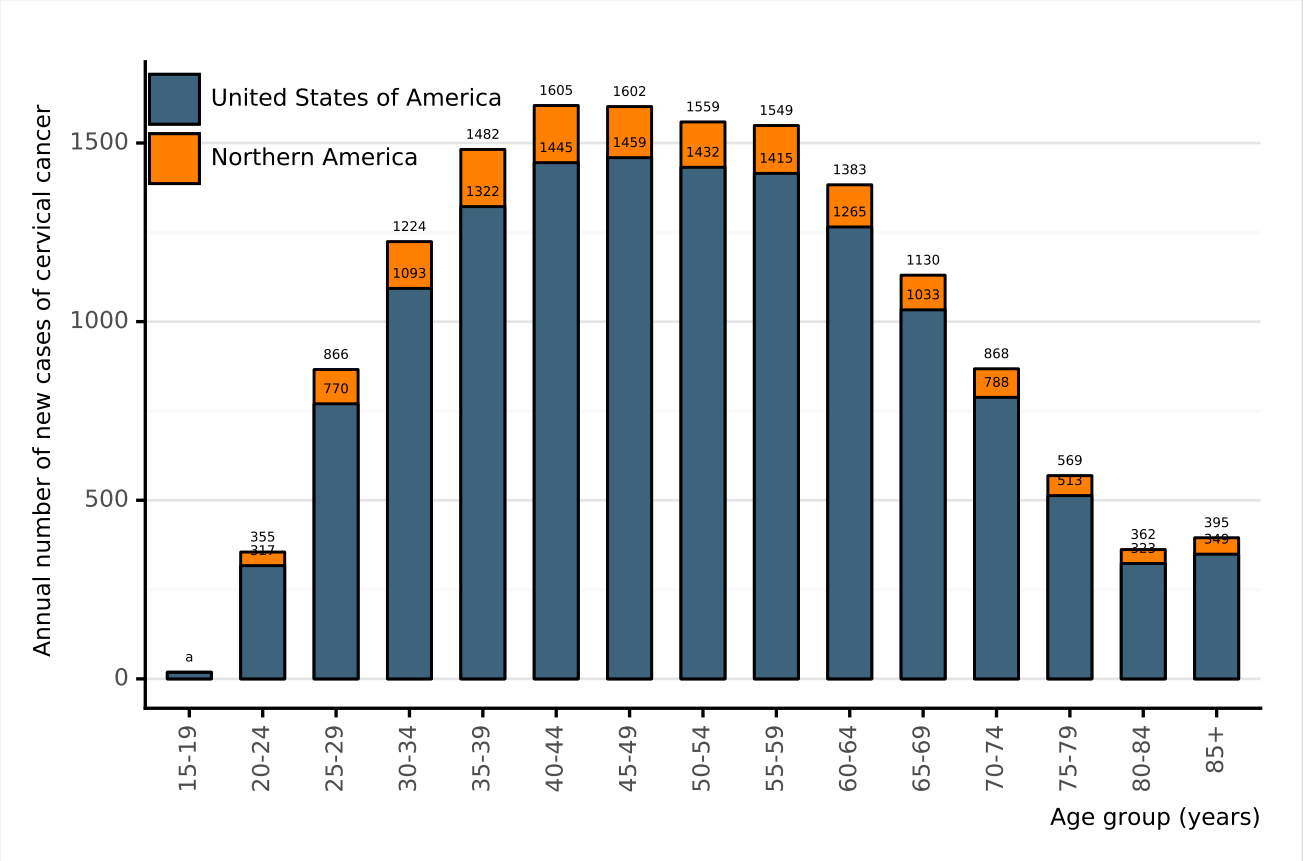
9.1.1 Cervical cancer incidence in United States of America across Northern America

Figure 73: Age-standardised incidence rates of cervical cancer of United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Rates per 100,000 women per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 74: Annual number of new cases of cervical cancer by age group in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021

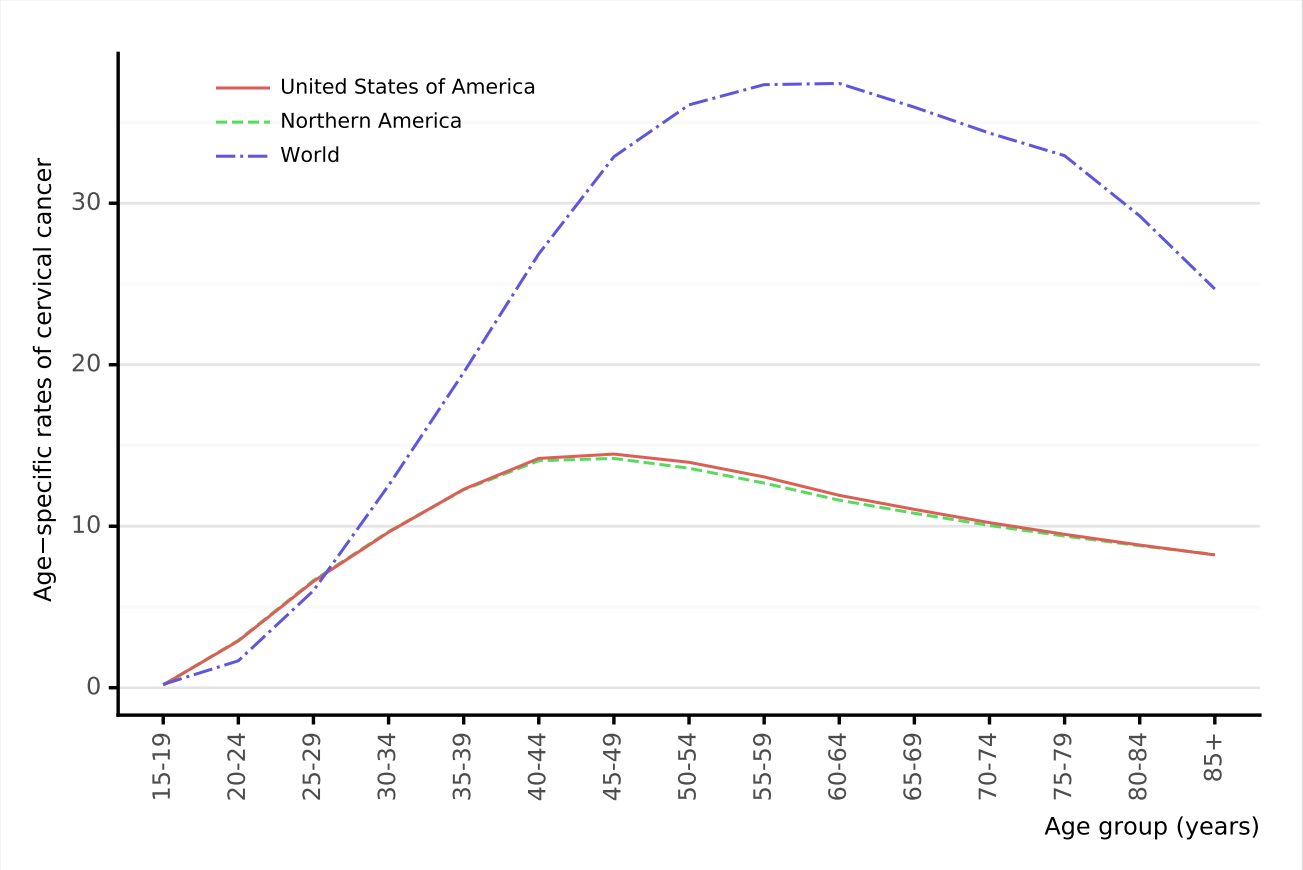
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

[a] 18 cases for United States of America and 19 cases for Northern America in the 15-19 age group.

Data Sources:

Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 75: Comparison of age-specific cervical cancer incidence rates in United States of America, within the region, and the rest of world



Data accessed on 27 Jan 2021

For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

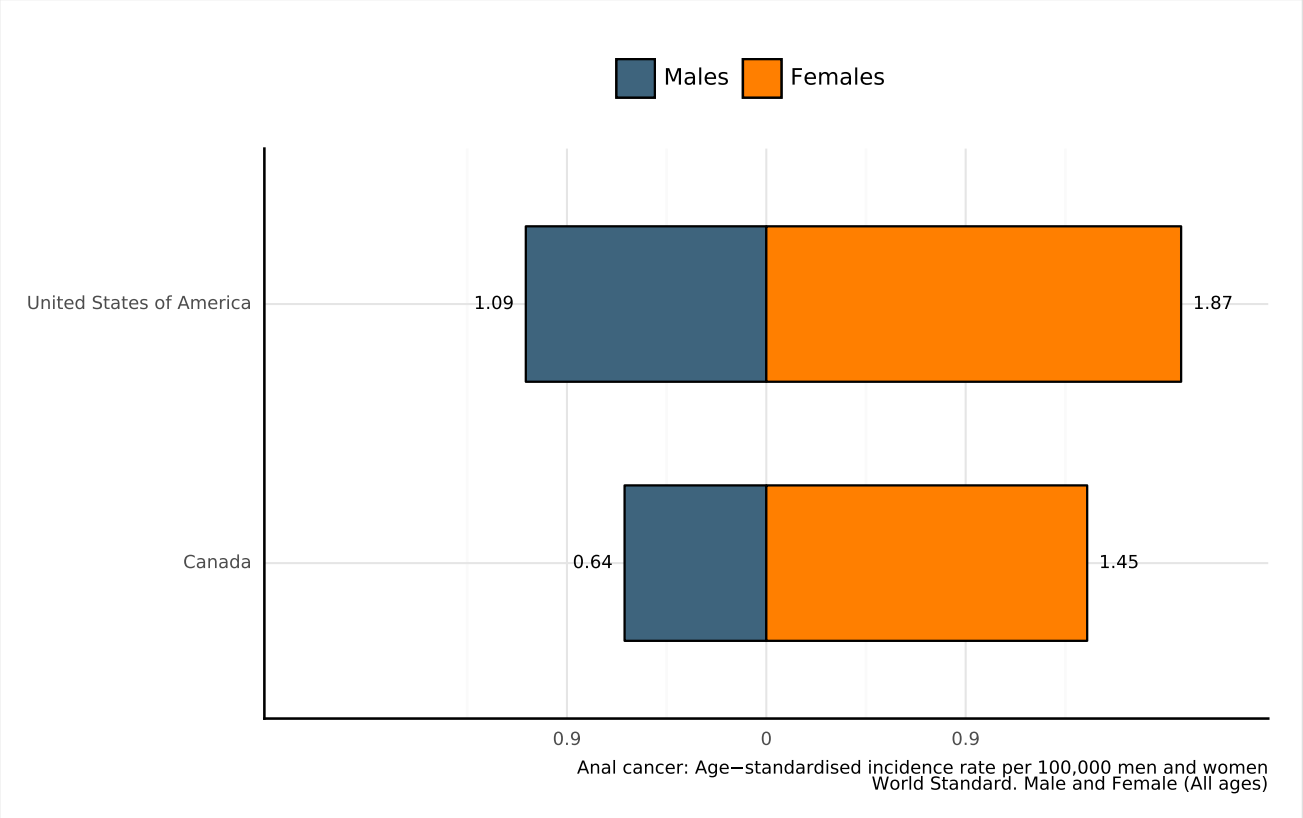
[a] Rates per 100,000 women per year.

Data Sources:

Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

9.1.2 Anal cancer incidence in United States of America across Northern America

Figure 76: Age-standardised incidence rates of anal cancer of United States of America (estimates for 2020)



Data accessed on 27 Jan 2021

For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

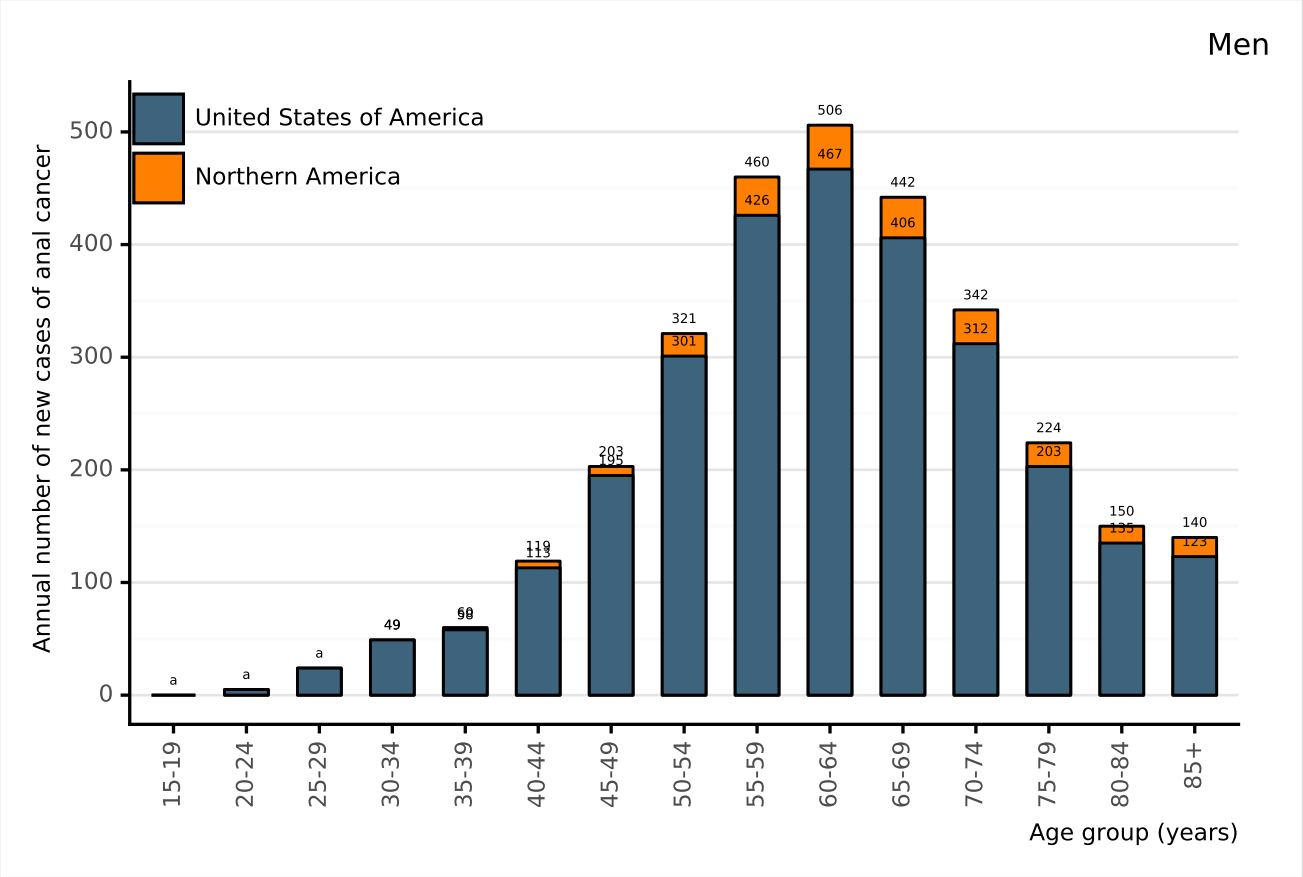
[a] Rates per 100,000 men per year.

[b] Rates per 100,000 women per year.

Data Sources:

Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 77: Annual number of new cases of anal cancer among men by age group in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021

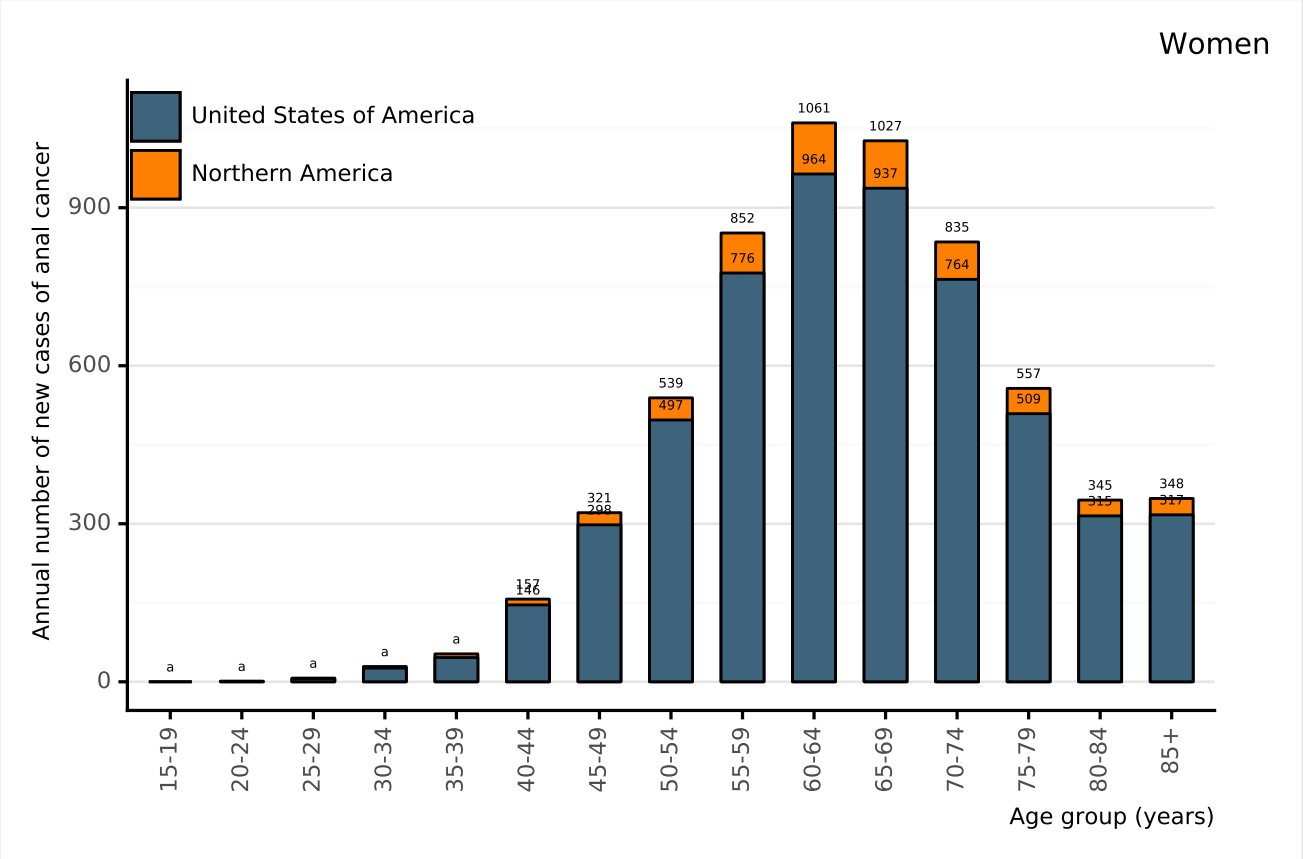
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

[a] 0 cases for United States of America and 0 cases for Northern America in the 15-19 age group. 5 cases for United States of America and 5 cases for Northern America in the 20-24 age group. 24 cases for United States of America and 24 cases for Northern America in the 25-29 age group.

Data Sources:

Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 78: Annual number of new cases of anal cancer among women by age group in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021

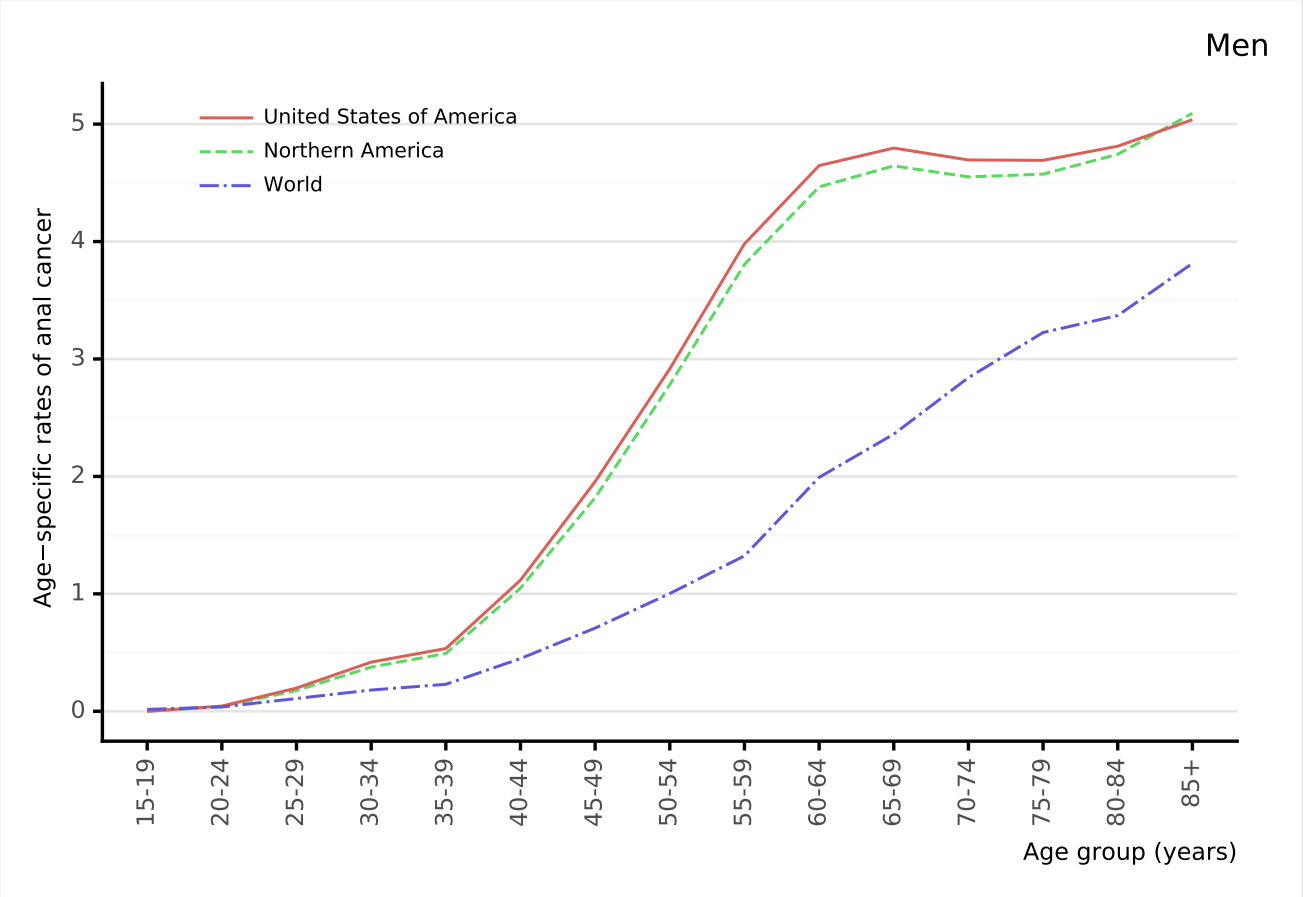
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

[a] 0 cases for United States of America and 0 cases for Northern America in the 15-19 age group. 1 cases for United States of America and 1 cases for Northern America in the 20-24 age group. 6 cases for United States of America and 7 cases for Northern America in the 25-29 age group. 26 cases for United States of America and 29 cases for Northern America in the 30-34 age group. 46 cases for United States of America and 53 cases for Northern America in the 35-39 age group.

Data Sources:

Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 79: Comparison of age-specific anal cancer incidence rates among men by age in United States of America, within the region, and the rest of world



Data accessed on 27 Jan 2021

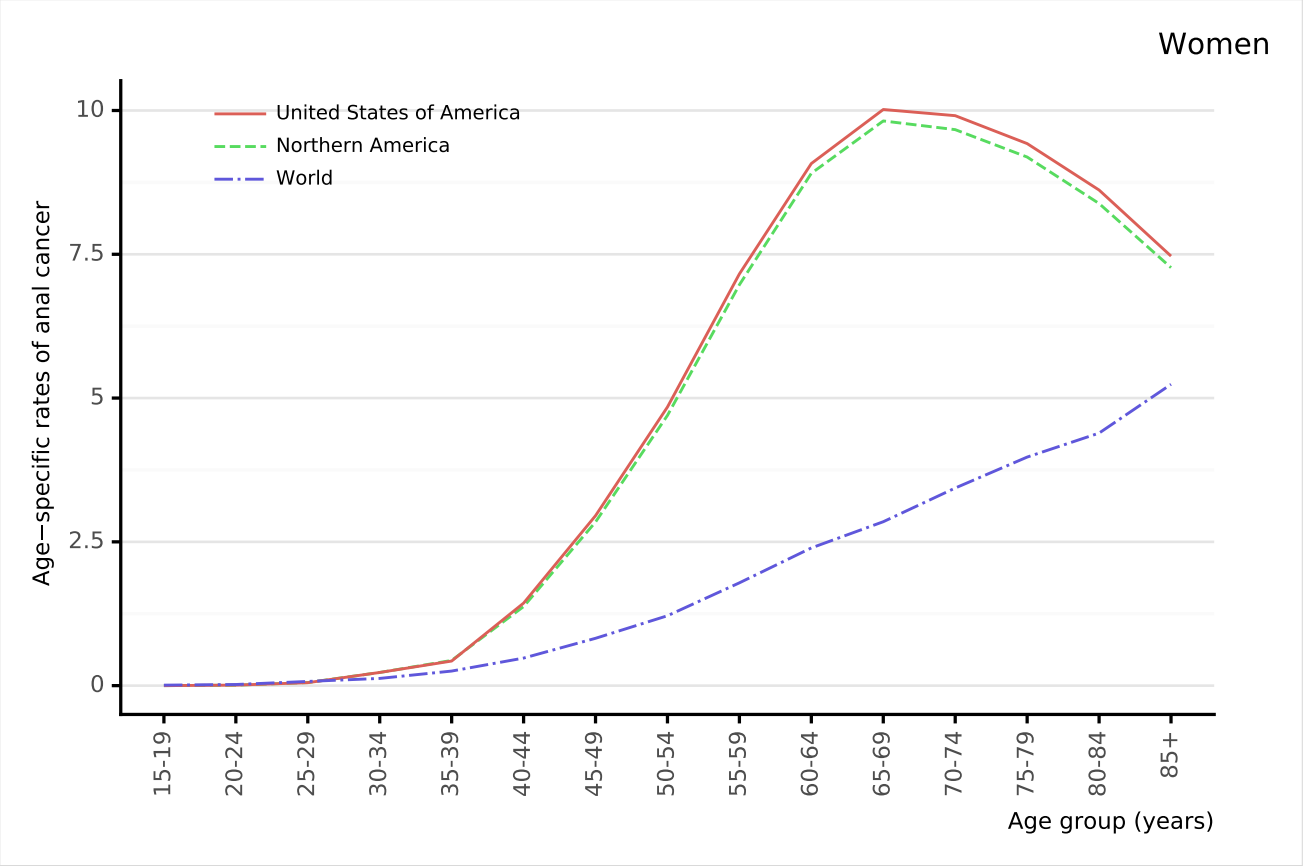
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

[a] Rates per 100,000 men per year.

Data Sources:

Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 80: Comparison of age-specific anal cancer incidence rates among women by age in United States of America, within the region, and the rest of world



Data accessed on 27 Jan 2021

For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

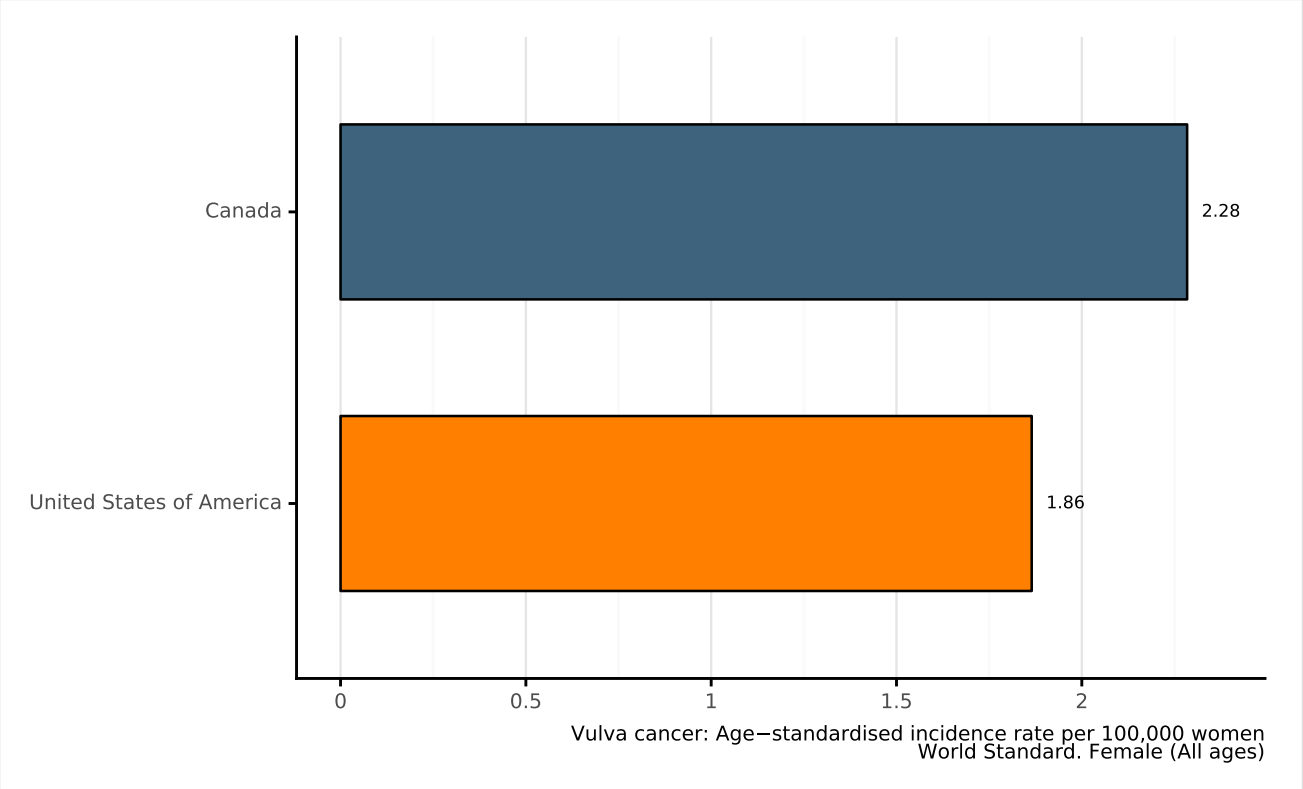
[a] Rates per 100,000 women per year.

Data Sources:

Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

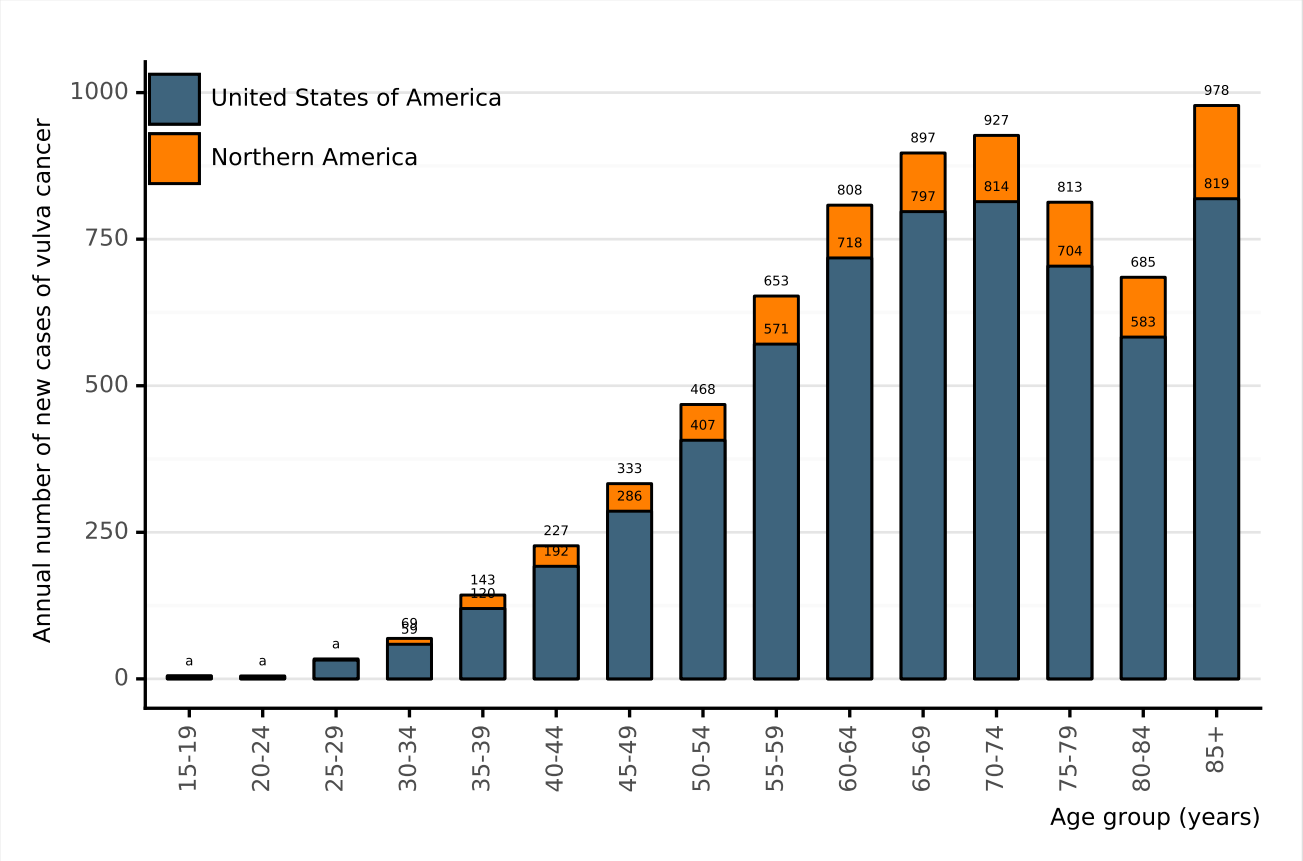
9.1.3 Vulva cancer incidence in United States of America across Northern America

Figure 81: Age-standardised incidence rates of vulva cancer of United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Rates per 100,000 women per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 82: Annual number of new cases of vulva cancer by age group in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021

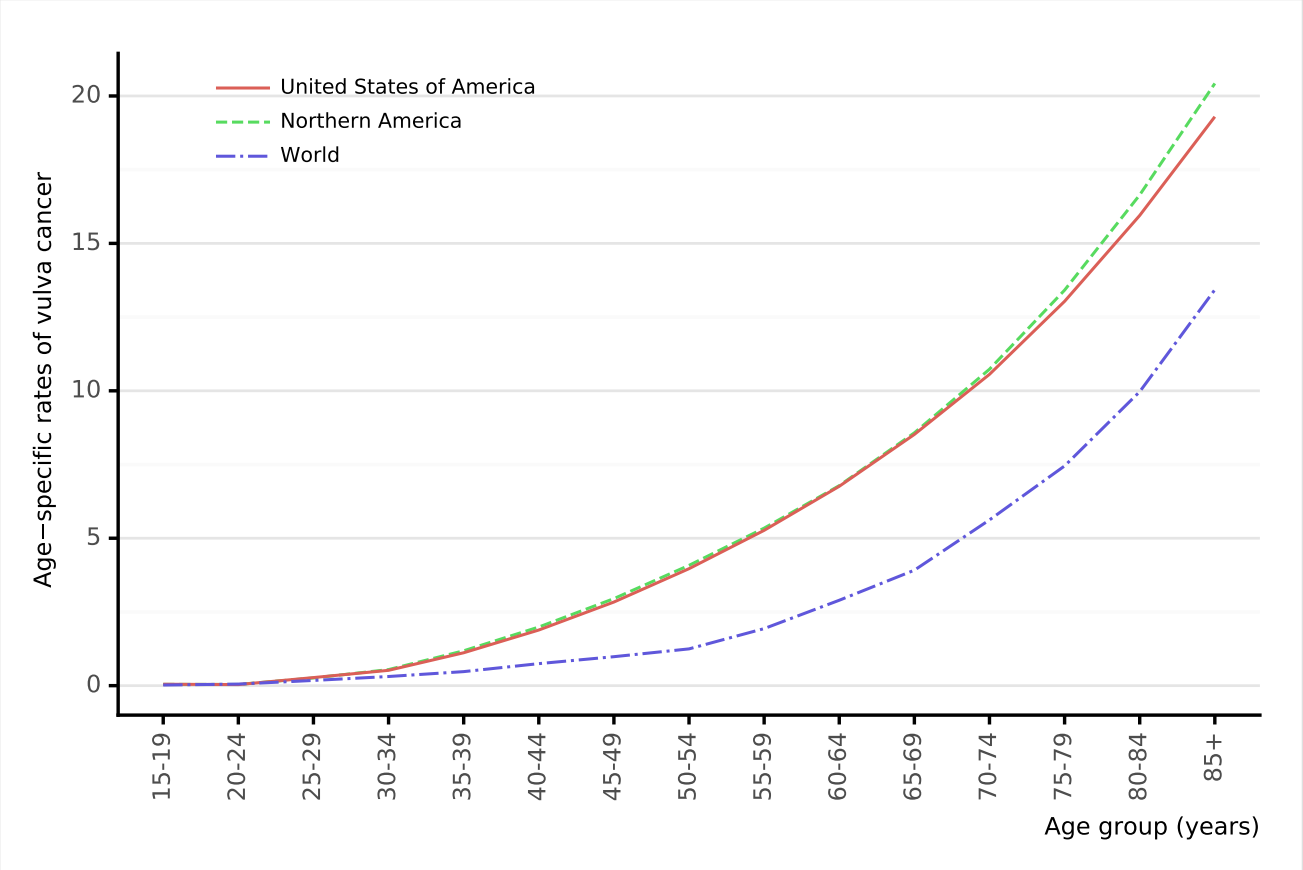
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

[a] 5 cases for United States of America and 5 cases for Northern America in the 15-19 age group. 4 cases for United States of America and 5 cases for Northern America in the 20-24 age group. 32 cases for United States of America and 34 cases for Northern America in the 25-29 age group.

Data Sources:

Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 83: Comparison of age-specific vulva cancer incidence rates in United States of America, within the region, and the rest of world



Data accessed on 27 Jan 2021

For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

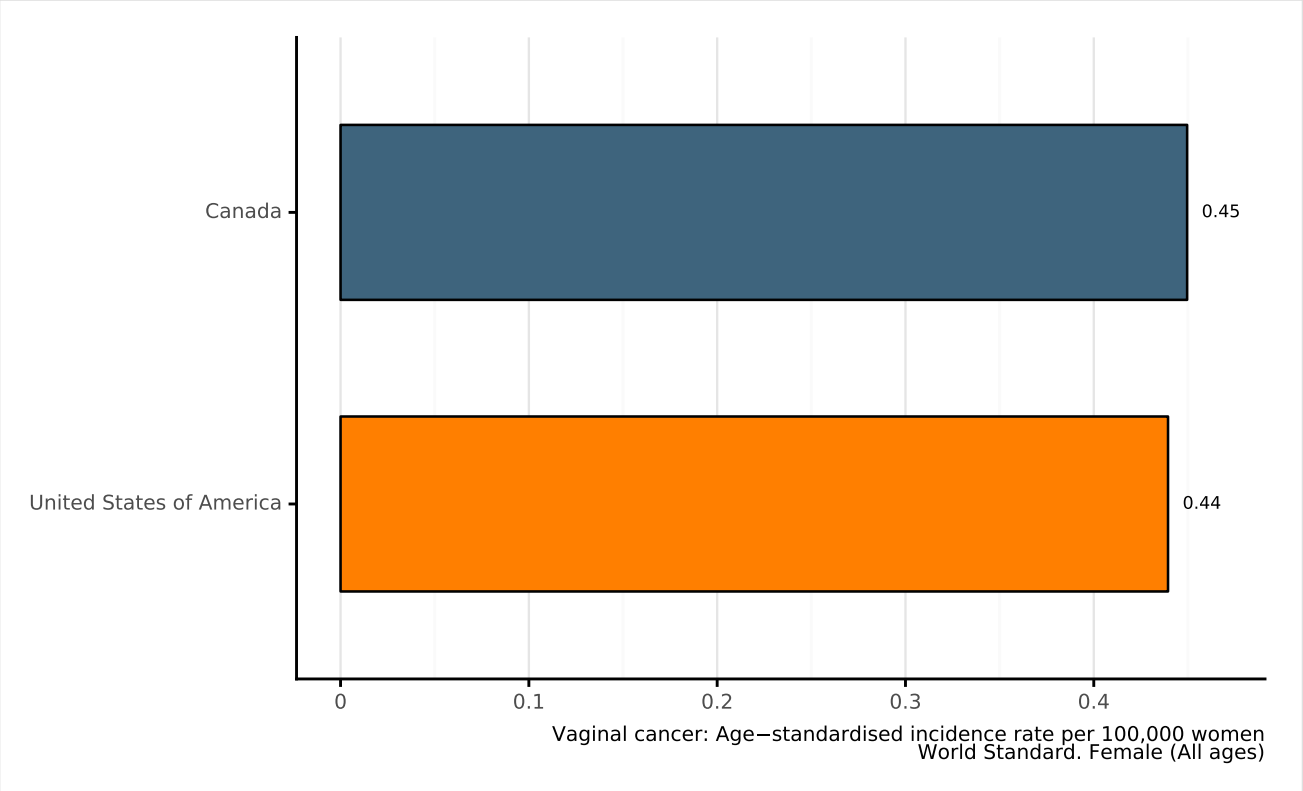
[a] Rates per 100,000 women per year.

Data Sources:

Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

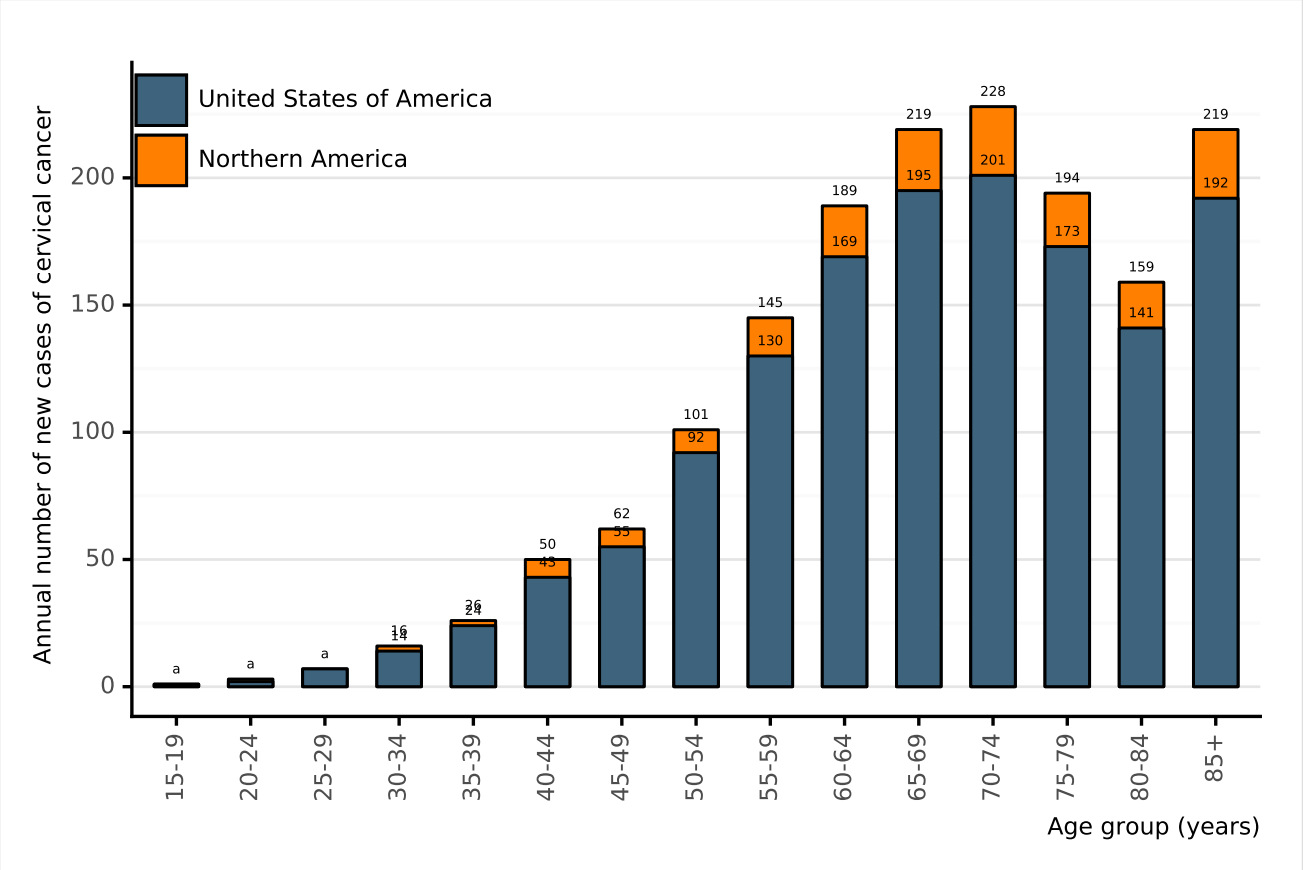
9.1.4 Vaginal cancer incidence in United States of America across Northern America

Figure 84: Age-standardised incidence rates of vaginal cancer of United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Rates per 100,000 women per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 85: Annual number of new cases of cervical cancer by age group in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021

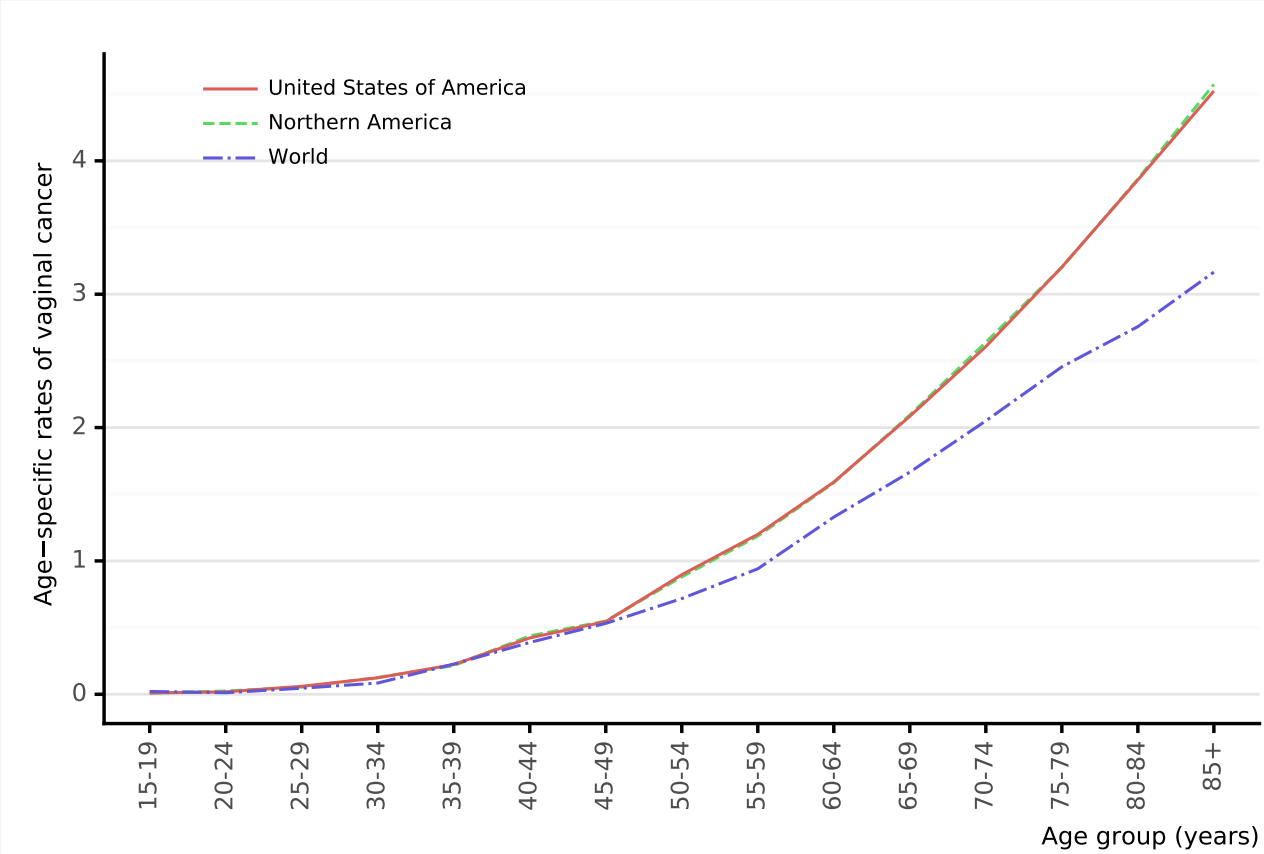
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

[a] 1 cases for United States of America and 1 cases for Northern America in the 15-19 age group. 2 cases for United States of America and 3 cases for Northern America in the 20-24 age group. 7 cases for United States of America and 7 cases for Northern America in the 25-29 age group.

Data Sources:

Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

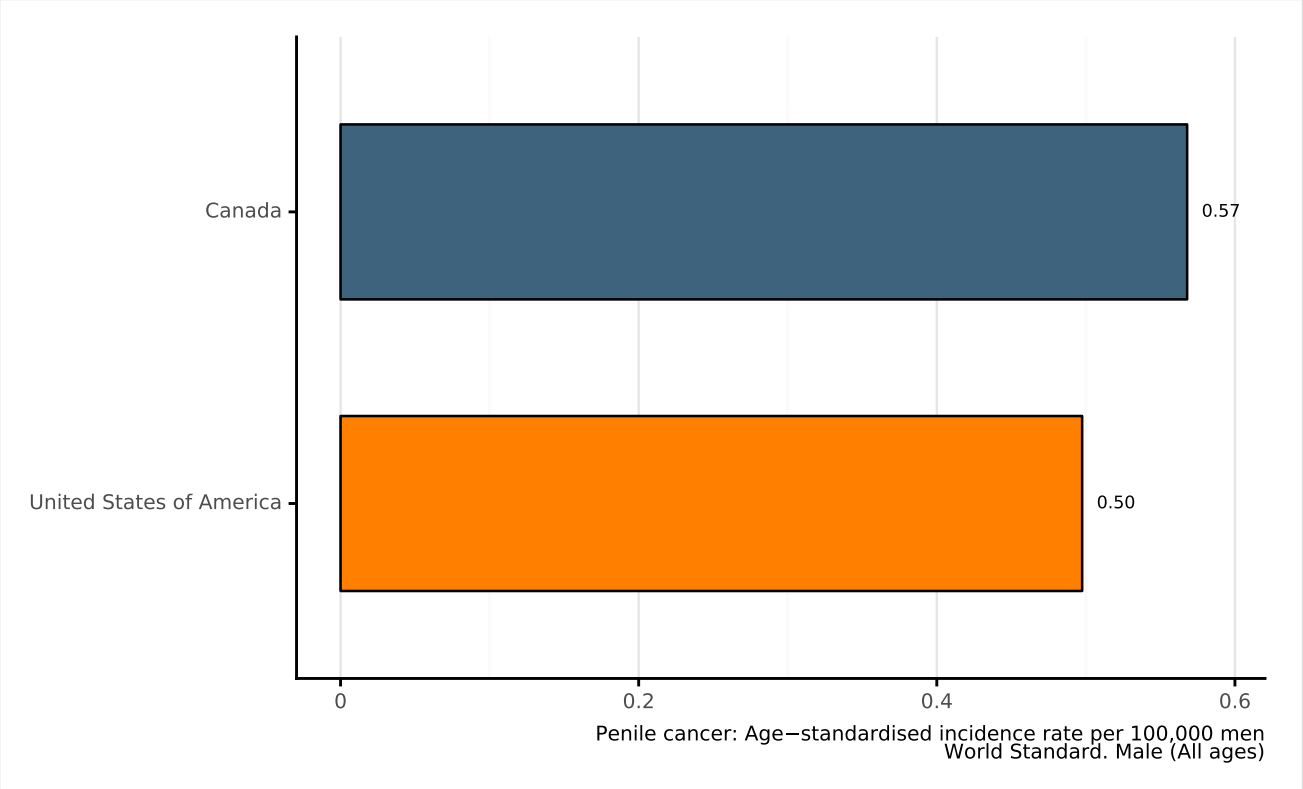
Figure 86: Comparison of age-specific vaginal cancer incidence rates in United States of America, within the region, and the rest of world



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Rates per 100,000 women per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

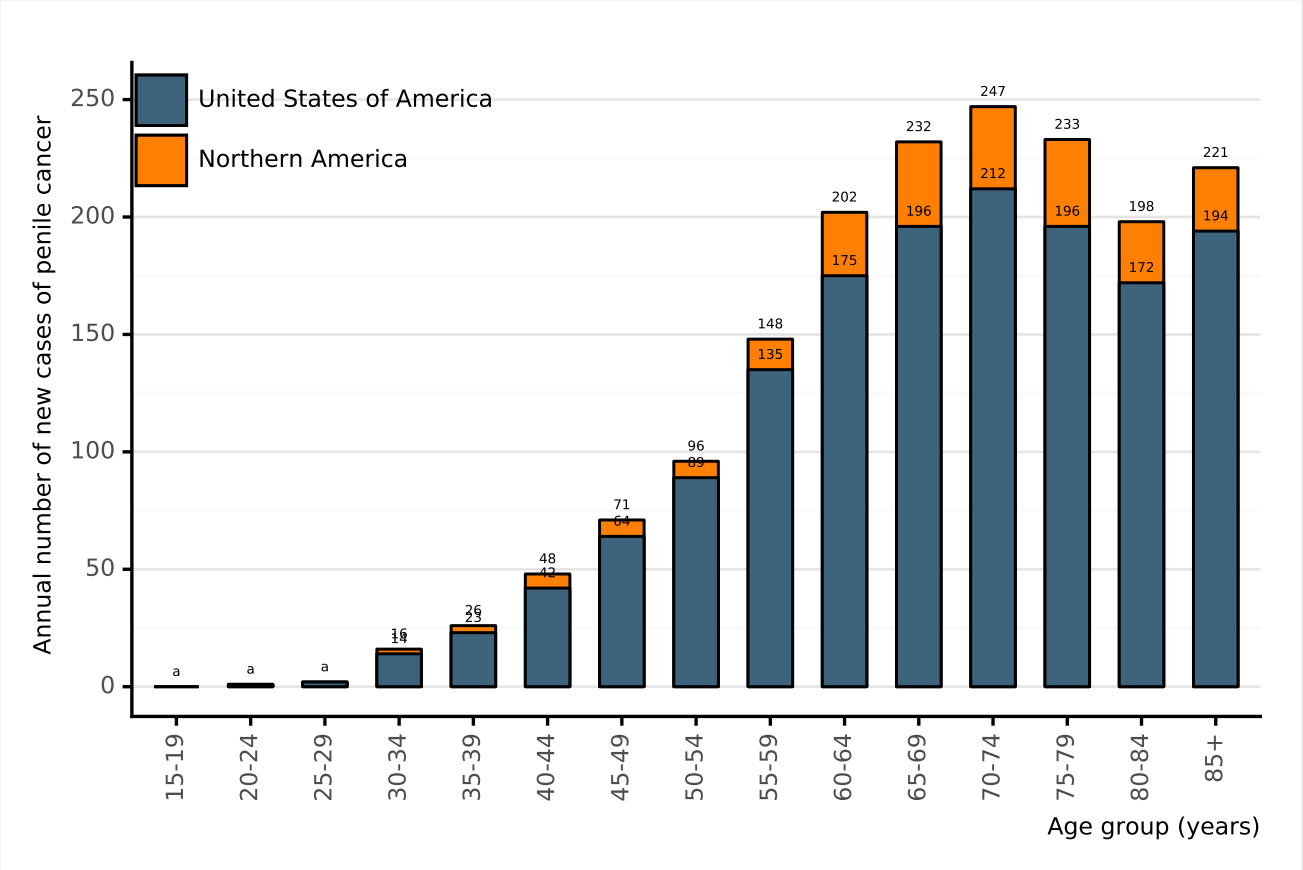
9.1.5 Penile cancer incidence in United States of America across Northern America

Figure 87: Age-standardised incidence rates of penile cancer of United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Rates per 100,000 men per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 88: Annual number of new cases of penile cancer by age group in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021

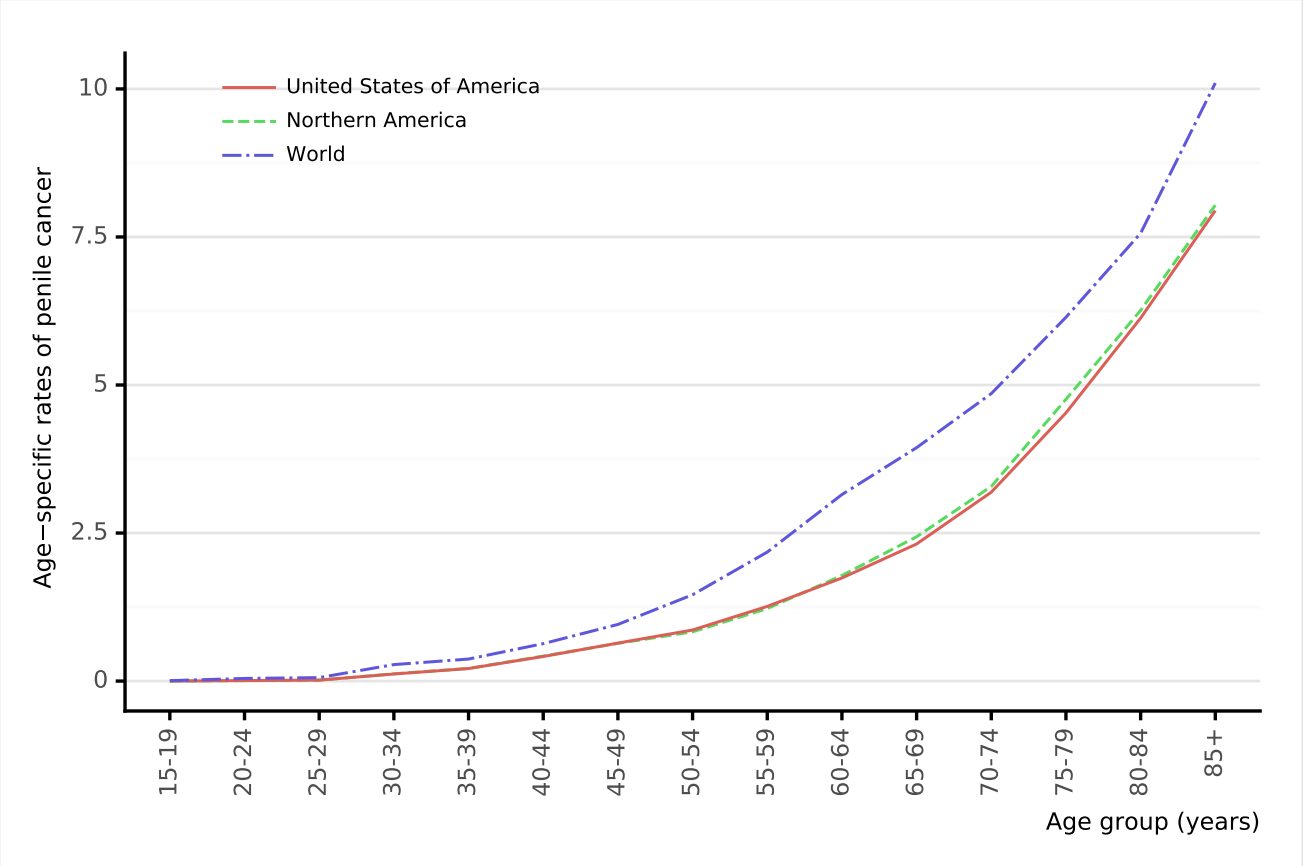
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

[a] 0 cases for United States of America and 0 cases for Northern America in the 15-19 age group. 1 cases for United States of America and 1 cases for Northern America in the 20-24 age group. 2 cases for United States of America and 2 cases for Northern America in the 25-29 age group.

Data Sources:

Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 89: Comparison of age-specific penile cancer incidence rates in United States of America, within the region, and the rest of world



Data accessed on 27 Jan 2021

For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

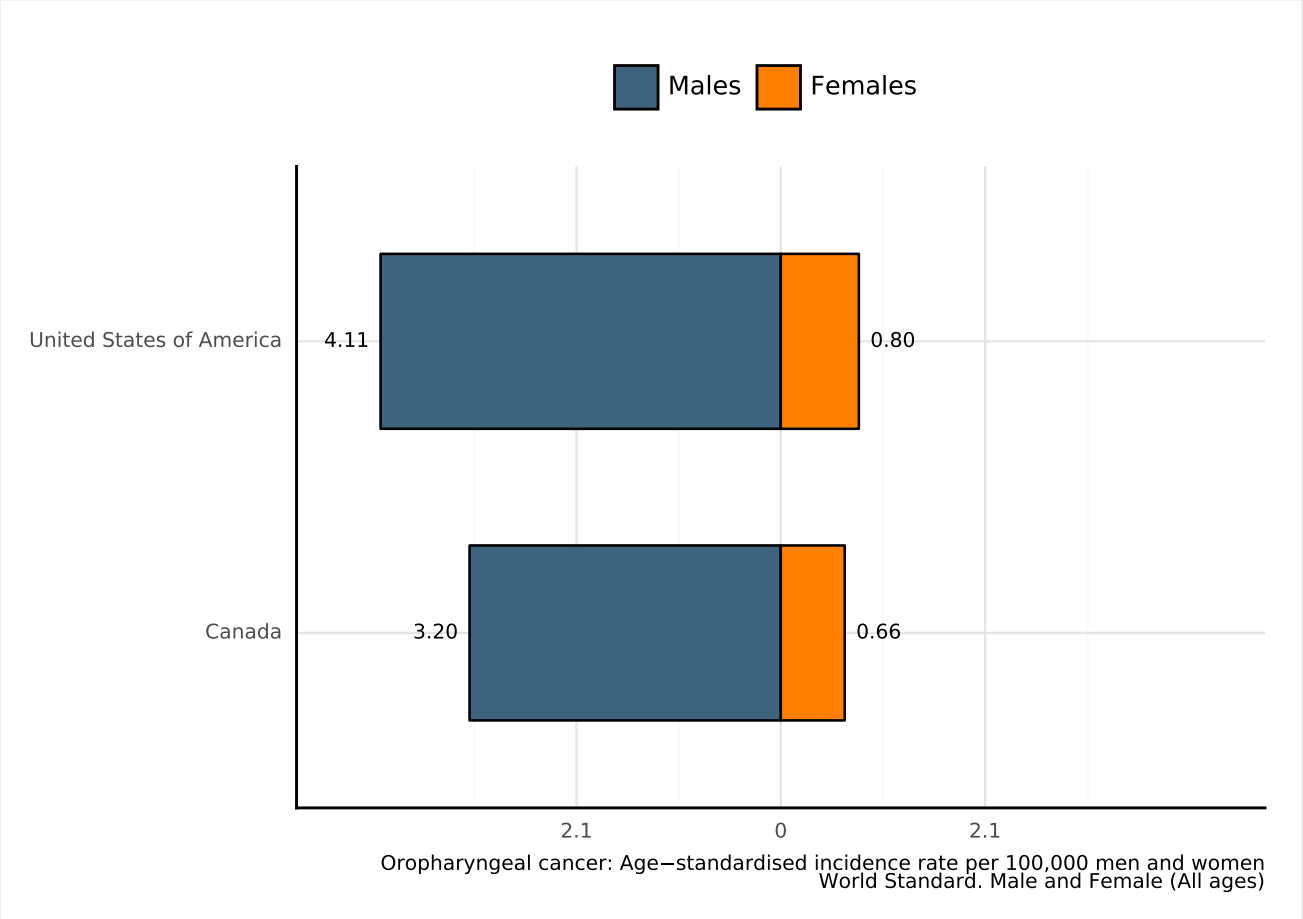
[a] Rates per 100,000 men per year.

Data Sources:

Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

9.1.6 Oropharyngeal cancer incidence in United States of America across Northern America

Figure 90: Age-standardised incidence rates of oropharyngeal cancer of United States of America (estimates for 2020)



Data accessed on 27 Jan 2021

For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

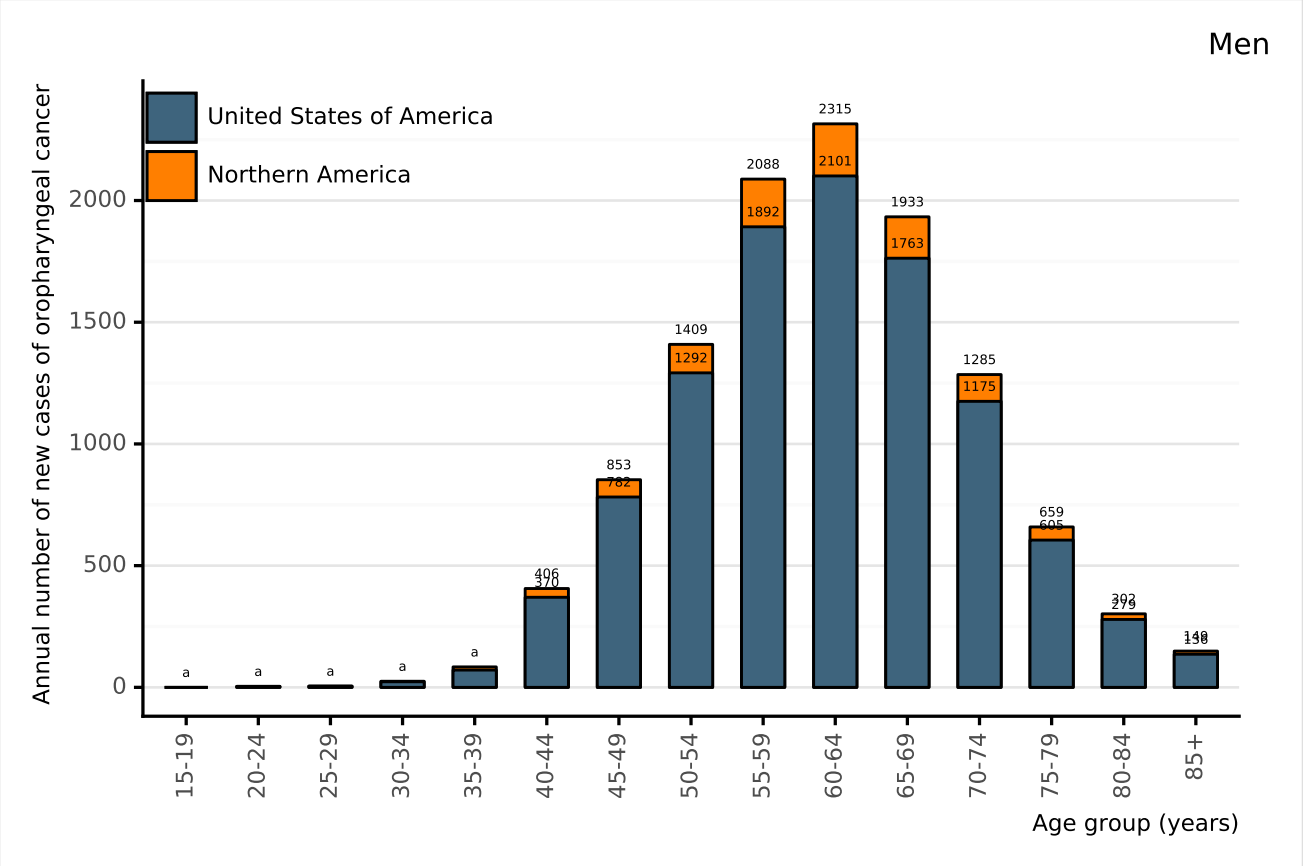
[a] Rates per 100,000 men per year.

[b] Rates per 100,000 women per year.

Data Sources:

Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 91: Annual number of new cases of oropharyngeal cancer among men by age group in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021

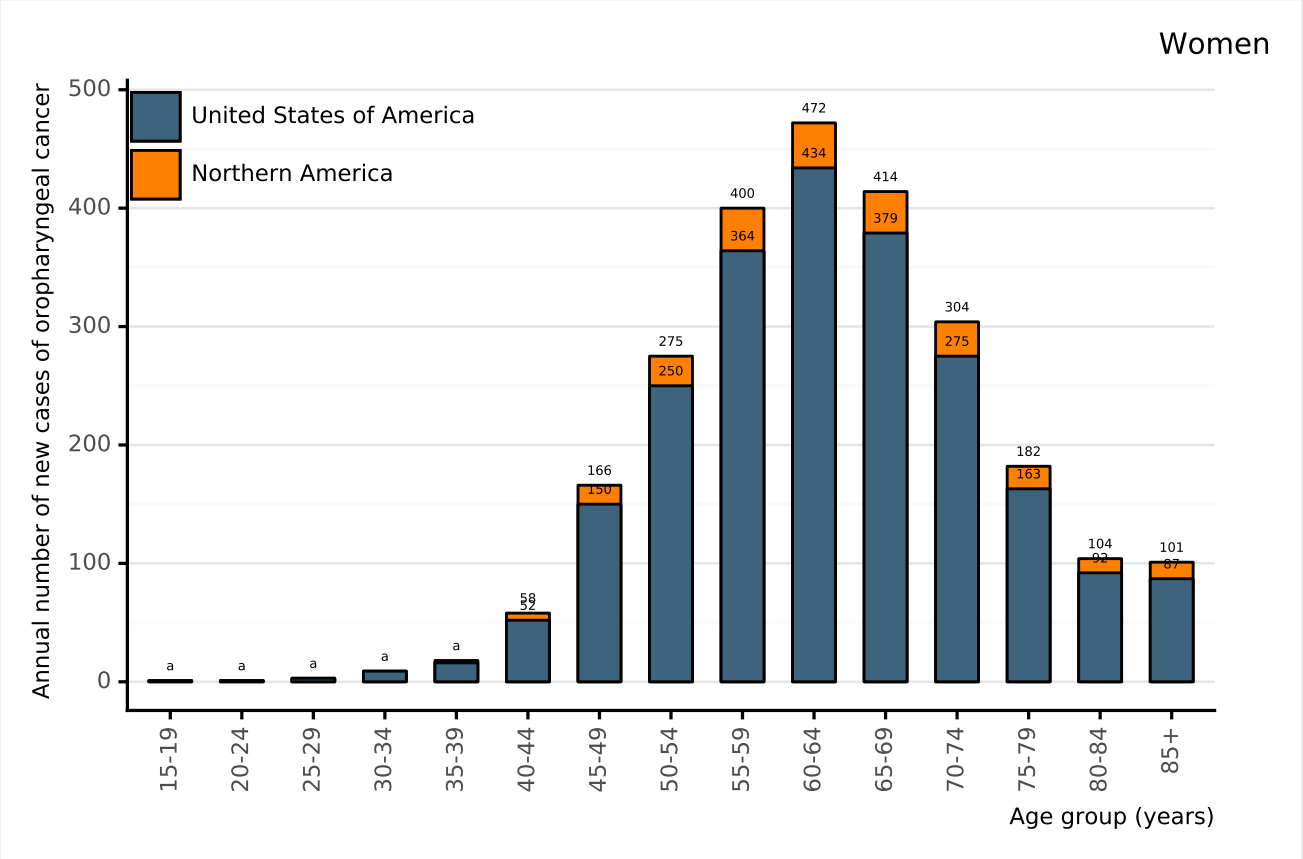
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

[a] 0 cases for United States of America and 0 cases for Northern America in the 15-19 age group. 4 cases for United States of America and 4 cases for Northern America in the 20-24 age group. 5 cases for United States of America and 5 cases for Northern America in the 25-29 age group. 23 cases for United States of America and 25 cases for Northern America in the 30-34 age group. 71 cases for United States of America and 84 cases for Northern America in the 35-39 age group.

Data Sources:

Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 92: Annual number of new cases of oropharyngeal cancer among women by age group in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021

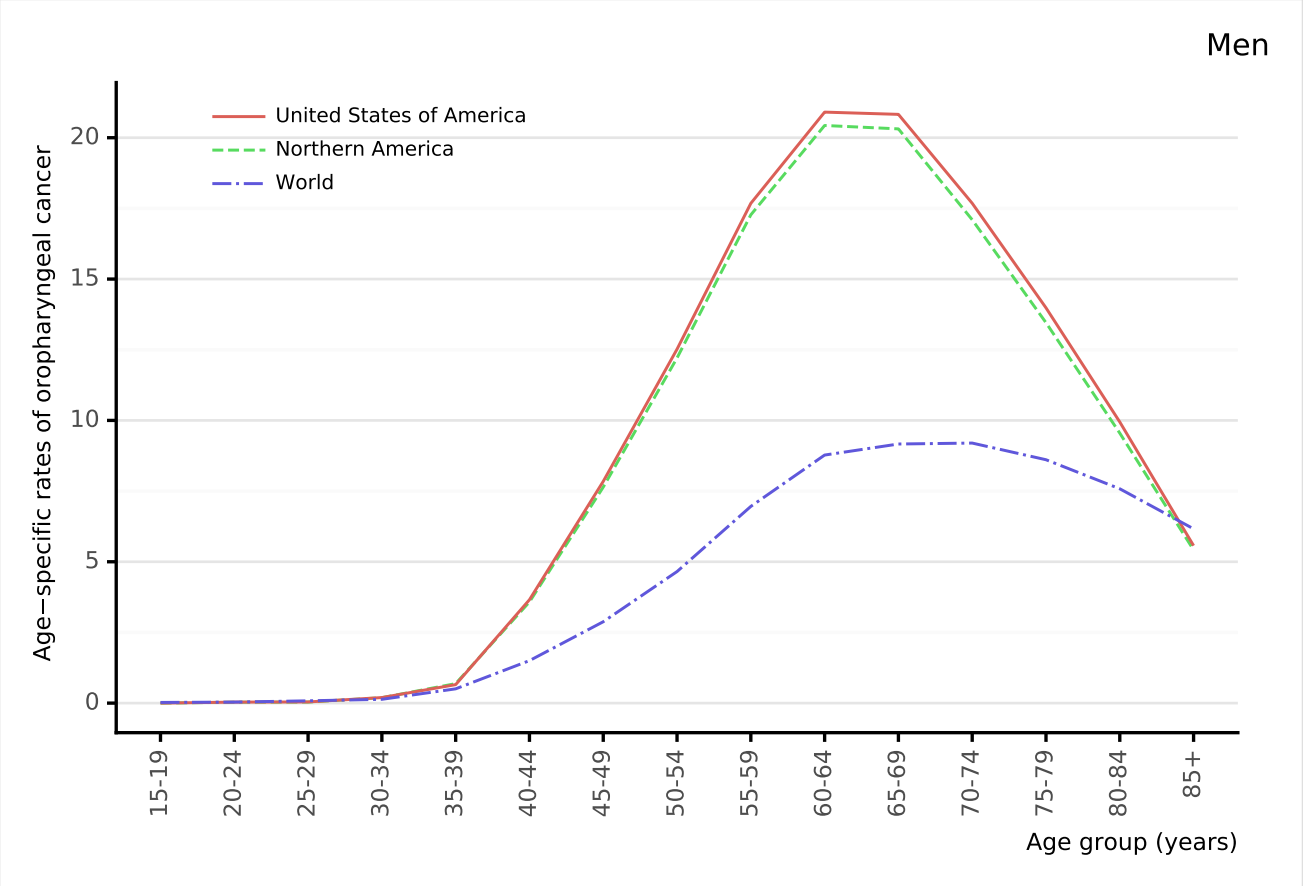
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

[a] 1 cases for United States of America and 1 cases for Northern America in the 15-19 age group. 1 cases for United States of America and 1 cases for Northern America in the 20-24 age group. 3 cases for United States of America and 3 cases for Northern America in the 25-29 age group. 9 cases for United States of America and 9 cases for Northern America in the 30-34 age group. 16 cases for United States of America and 18 cases for Northern America in the 35-39 age group.

Data Sources:

Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 93: Comparison of age-specific oropharyngeal cancer incidence rates among men by age in United States of America, within the region, and the rest of world



Data accessed on 27 Jan 2021

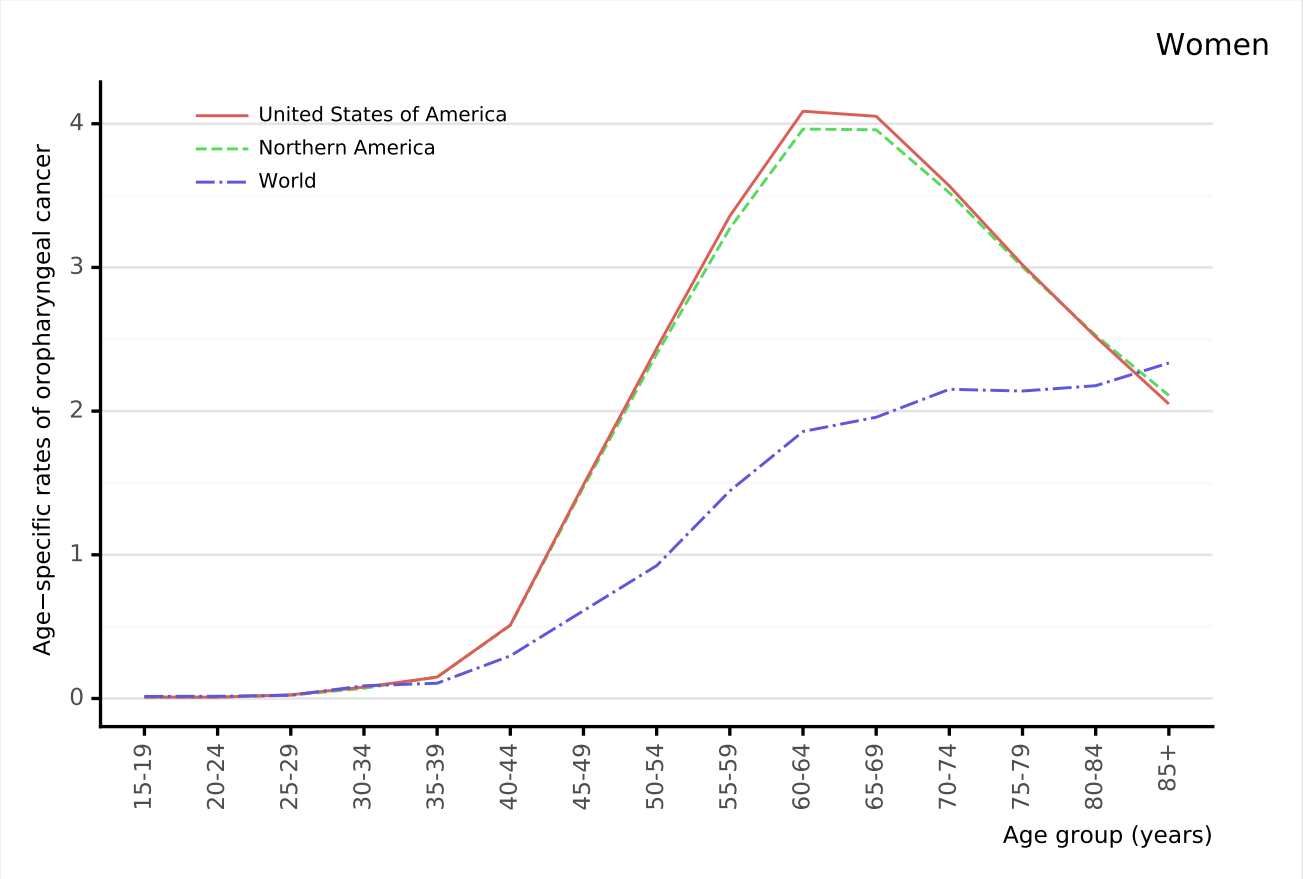
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

[a] Rates per 100,000 men per year.

Data Sources:

Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 94: Comparison of age-specific oropharyngeal cancer incidence rates among women by age in United States of America, within the region, and the rest of world



Data accessed on 27 Jan 2021

For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

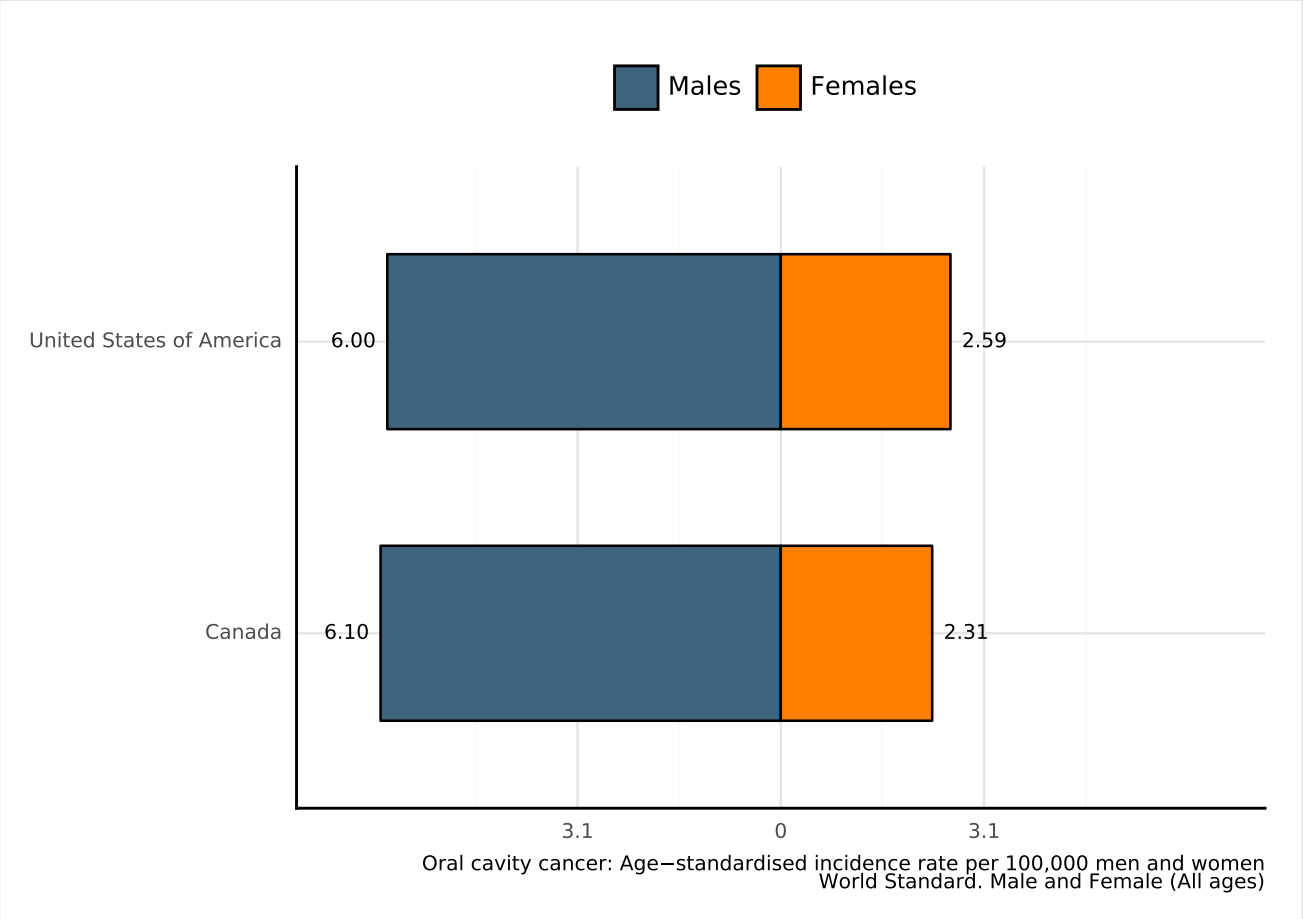
[a] Rates per 100,000 women per year.

Data Sources:

Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

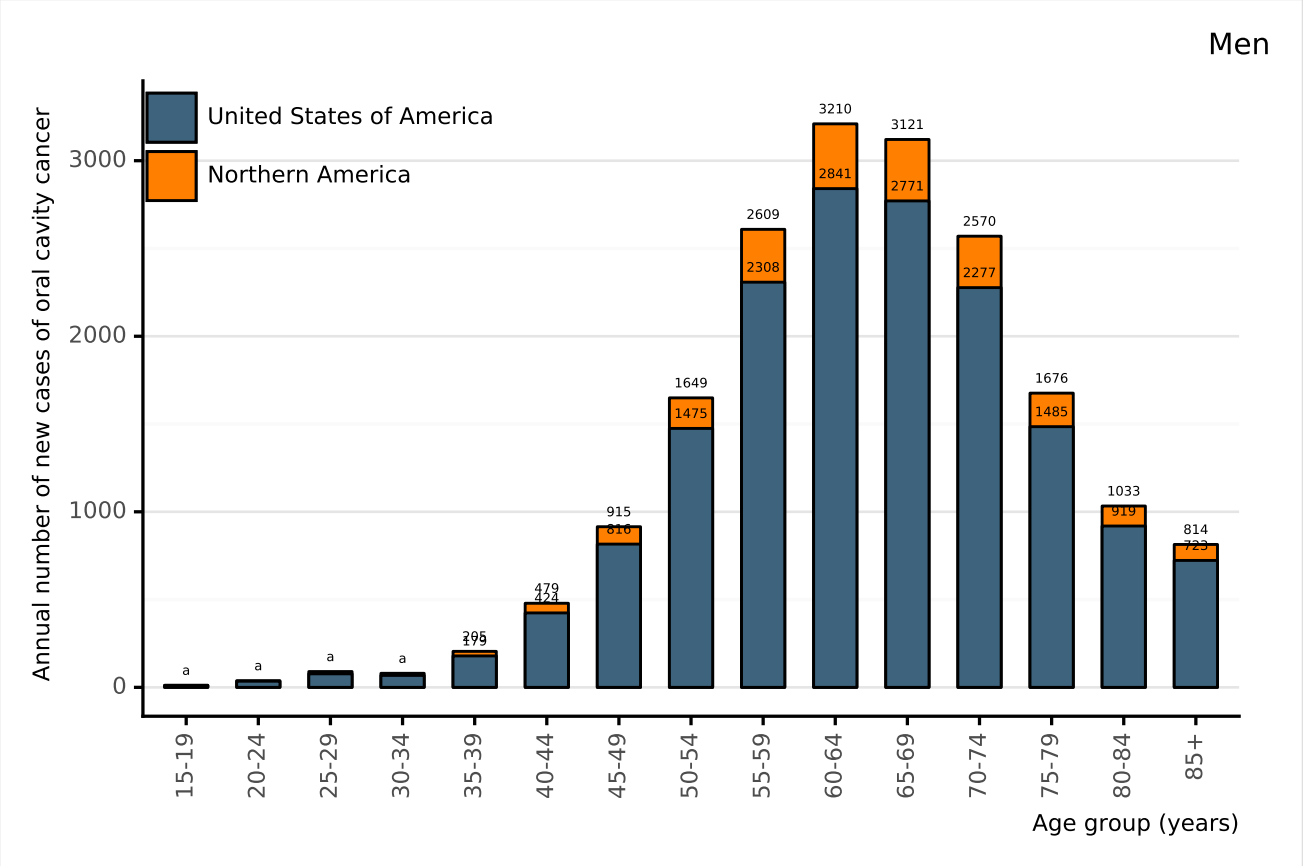
9.1.7 Oral cavity cancer incidence in United States of America across Northern America

Figure 95: Age-standardised incidence rates of oral cavity cancer of United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Rates per 100,000 men per year.
[b] Rates per 100,000 women per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 96: Annual number of new cases of oral cavity cancer among men by age group in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021

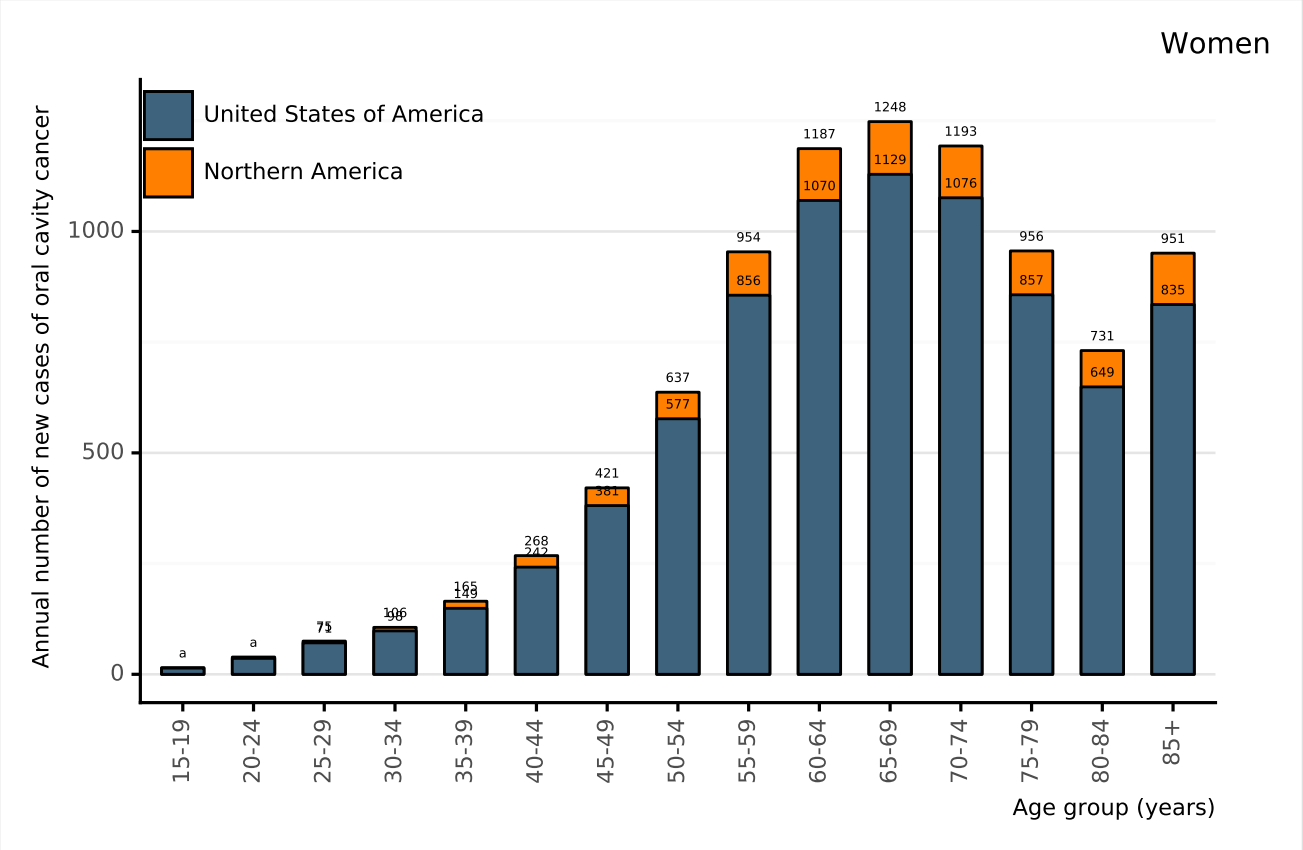
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

[a] 11 cases for United States of America and 12 cases for Northern America in the 15-19 age group. 35 cases for United States of America and 38 cases for Northern America in the 20-24 age group. 77 cases for United States of America and 90 cases for Northern America in the 25-29 age group. 68 cases for United States of America and 80 cases for Northern America in the 30-34 age group.

Data Sources:

Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 97: Annual number of new cases of oral cavity cancer among women by age group in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021

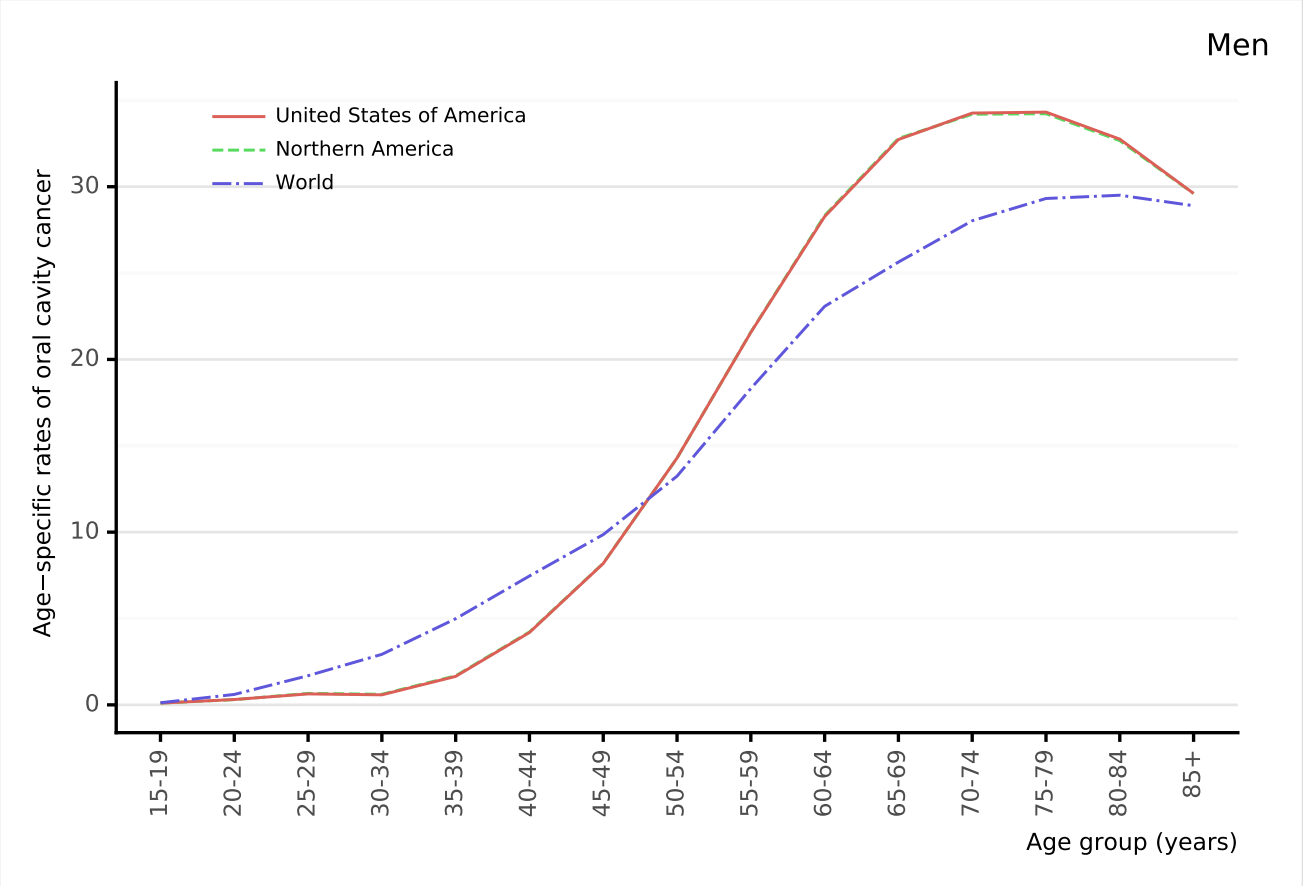
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

[a] 14 cases for United States of America and 15 cases for Northern America in the 15-19 age group. 36 cases for United States of America and 39 cases for Northern America in the 20-24 age group.

Data Sources:

Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 98: Comparison of age-specific oral cavity cancer incidence rates among men by age in United States of America, within the region, and the rest of world



Data accessed on 27 Jan 2021

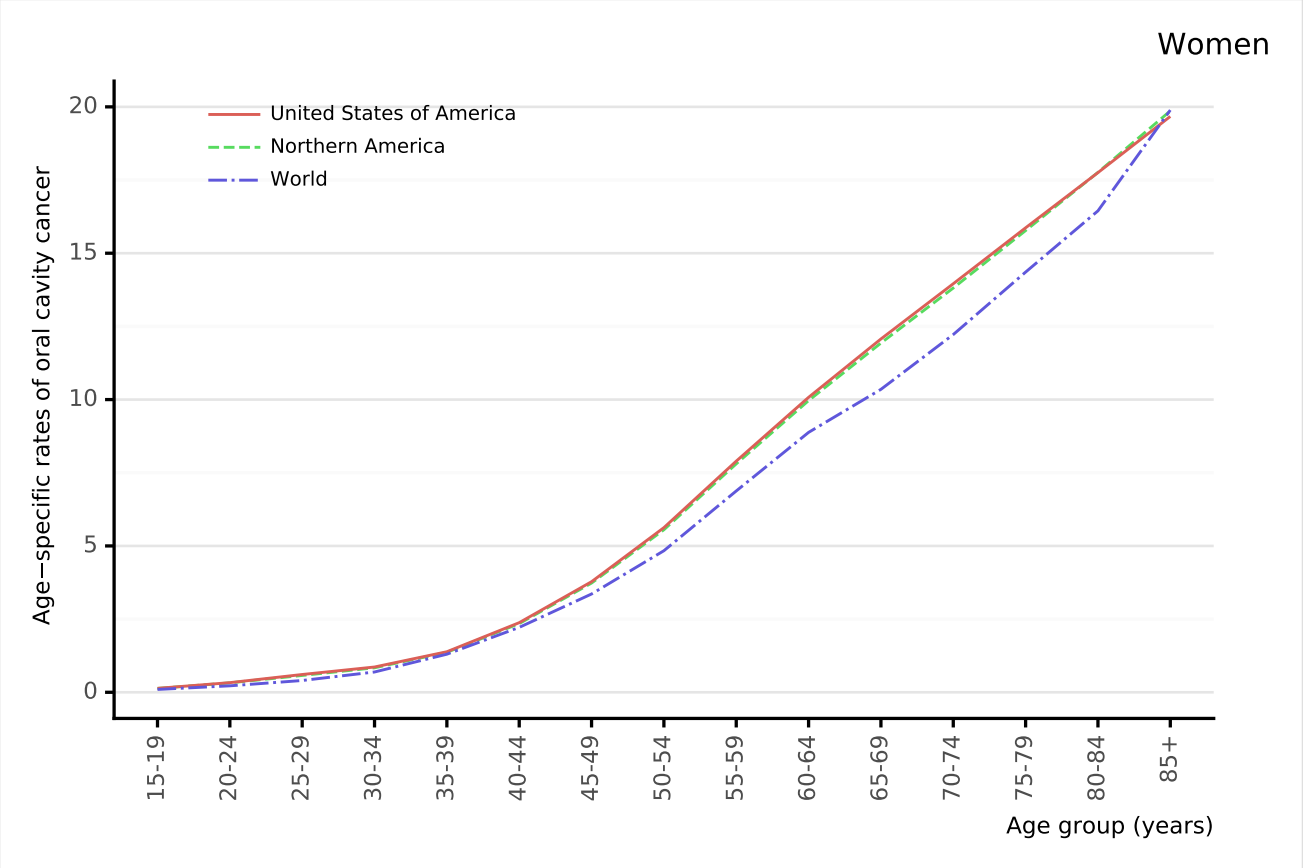
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

[a] Rates per 100,000 men per year.

Data Sources:

Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 99: Comparison of age-specific oral cavity cancer incidence rates among women by age in United States of America, within the region, and the rest of world



Data accessed on 27 Jan 2021

For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

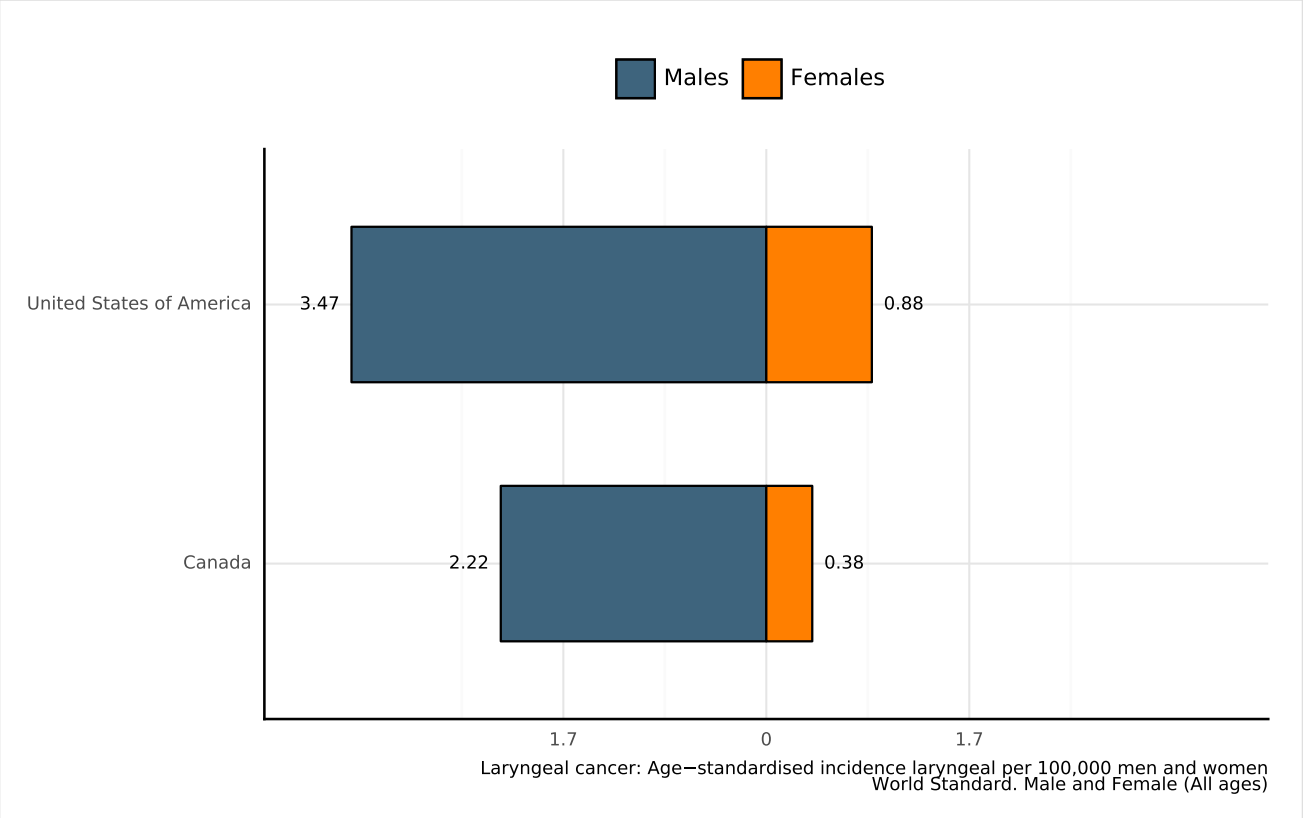
[a] Rates per 100,000 women per year.

Data Sources:

Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

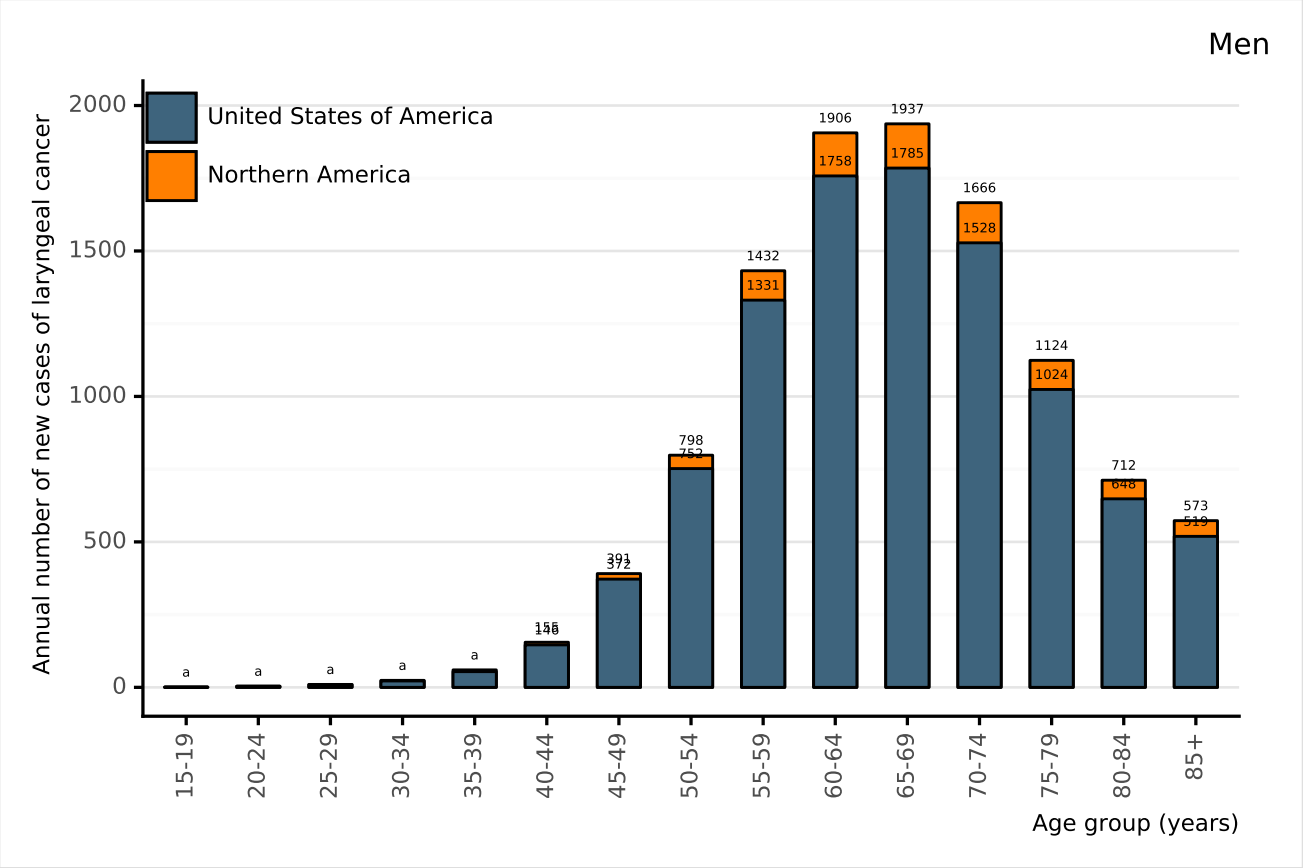
9.1.8 Laryngeal cancer incidence in United States of America across Northern America

Figure 100: Age-standardised incidence rates of laryngeal cancer of United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Rates per 100,000 men per year.
[b] Rates per 100,000 women per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 101: Annual number of new cases of laryngeal cancer among men by age group in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021

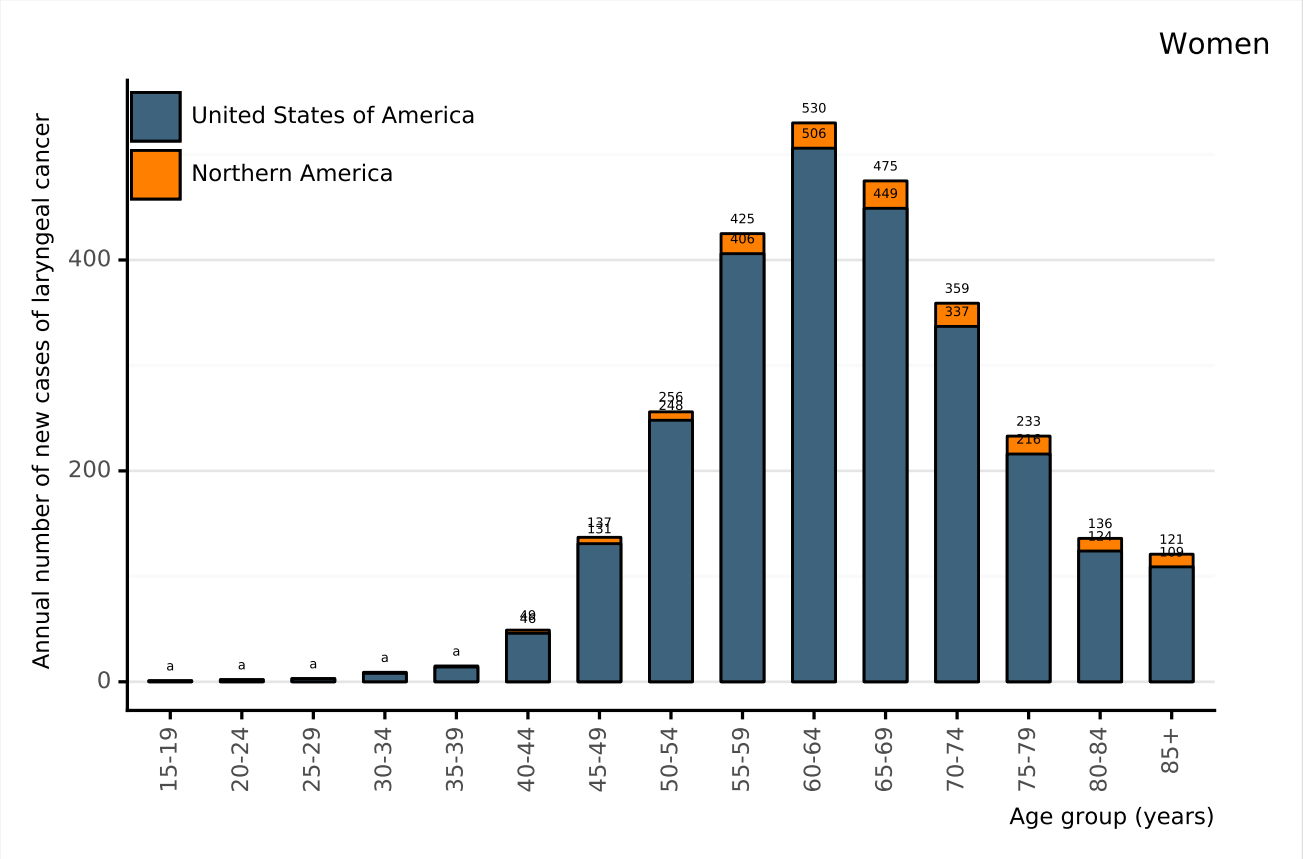
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

[a] 1 cases for United States of America and 1 cases for Northern America in the 15-19 age group. 4 cases for United States of America and 4 cases for Northern America in the 20-24 age group. 9 cases for United States of America and 10 cases for Northern America in the 25-29 age group. 22 cases for United States of America and 24 cases for Northern America in the 30-34 age group. 54 cases for United States of America and 60 cases for Northern America in the 35-39 age group.

Data Sources:

Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 102: Annual number of new cases of laryngeal cancer among women by age group in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021

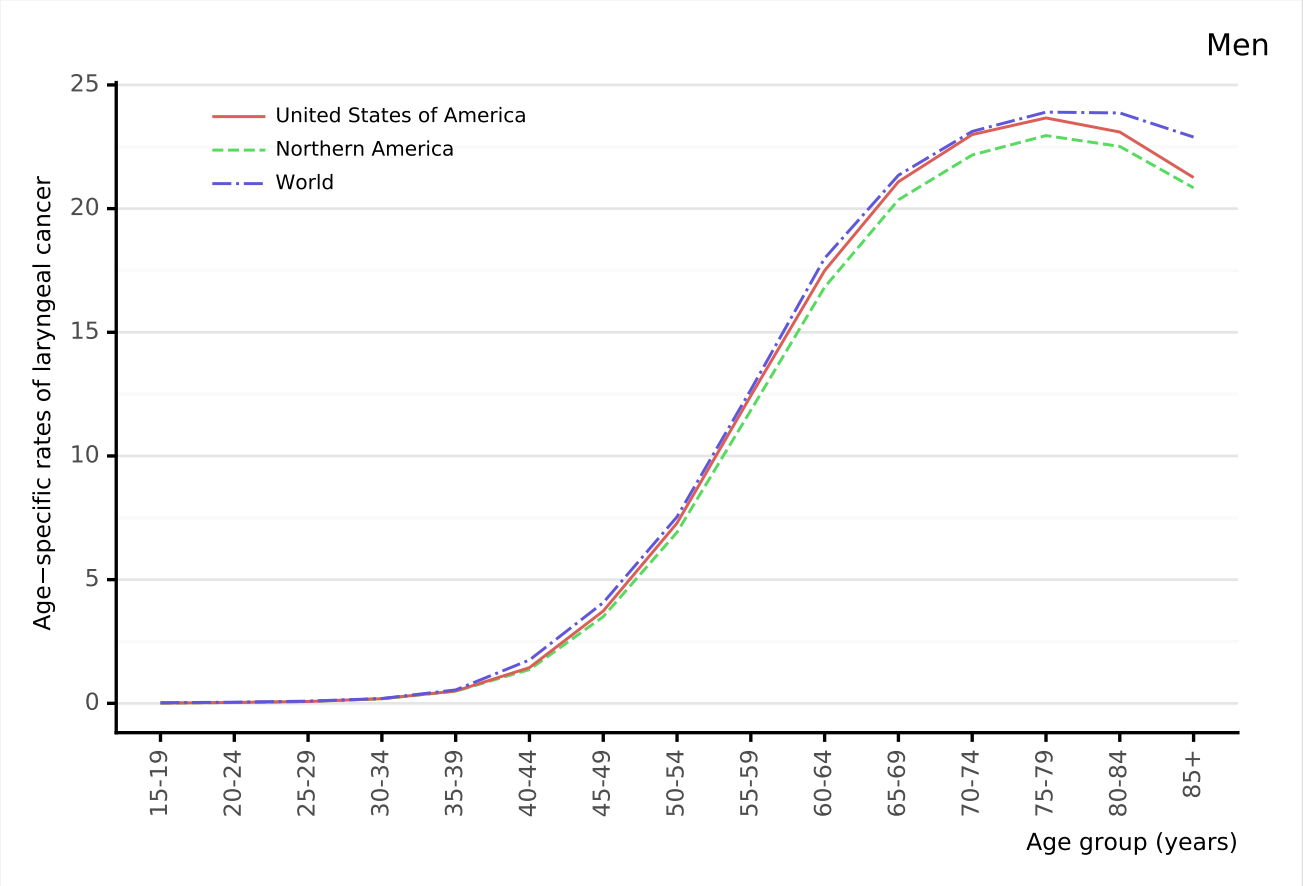
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

[a] 1 cases for United States of America and 1 cases for Northern America in the 15-19 age group. 2 cases for United States of America and 2 cases for Northern America in the 20-24 age group. 3 cases for United States of America and 3 cases for Northern America in the 25-29 age group. 8 cases for United States of America and 9 cases for Northern America in the 30-34 age group. 14 cases for United States of America and 15 cases for Northern America in the 35-39 age group.

Data Sources:

Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 103: Comparison of age-specific laryngeal cancer incidence rates among men by age in United States of America, within the region, and the rest of world



Data accessed on 27 Jan 2021

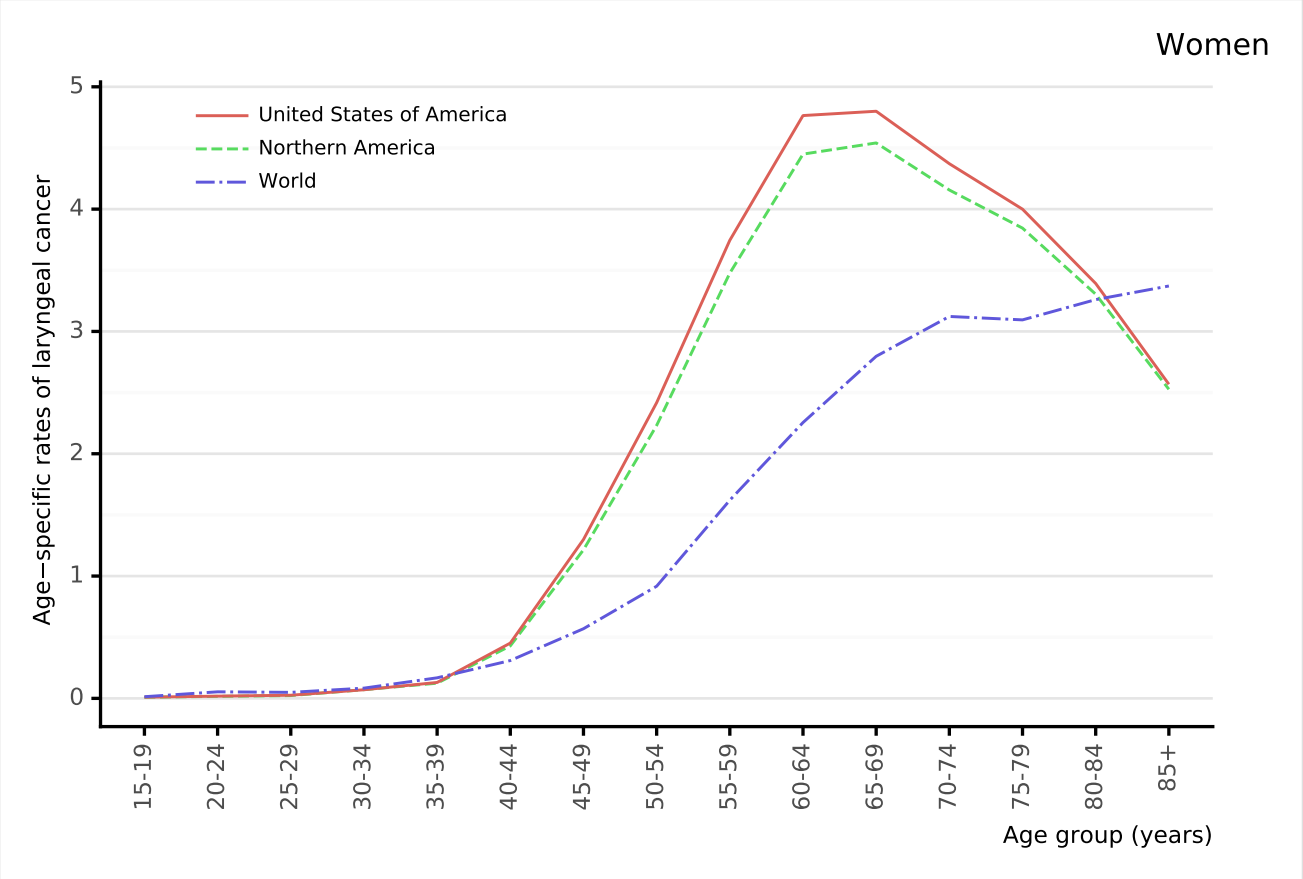
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

[a] Rates per 100,000 men per year.

Data Sources:

Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 104: Comparison of age-specific laryngeal cancer incidence rates among women by age in United States of America, within the region, and the rest of world



Data accessed on 27 Jan 2021

For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

[a] Rates per 100,000 women per year.

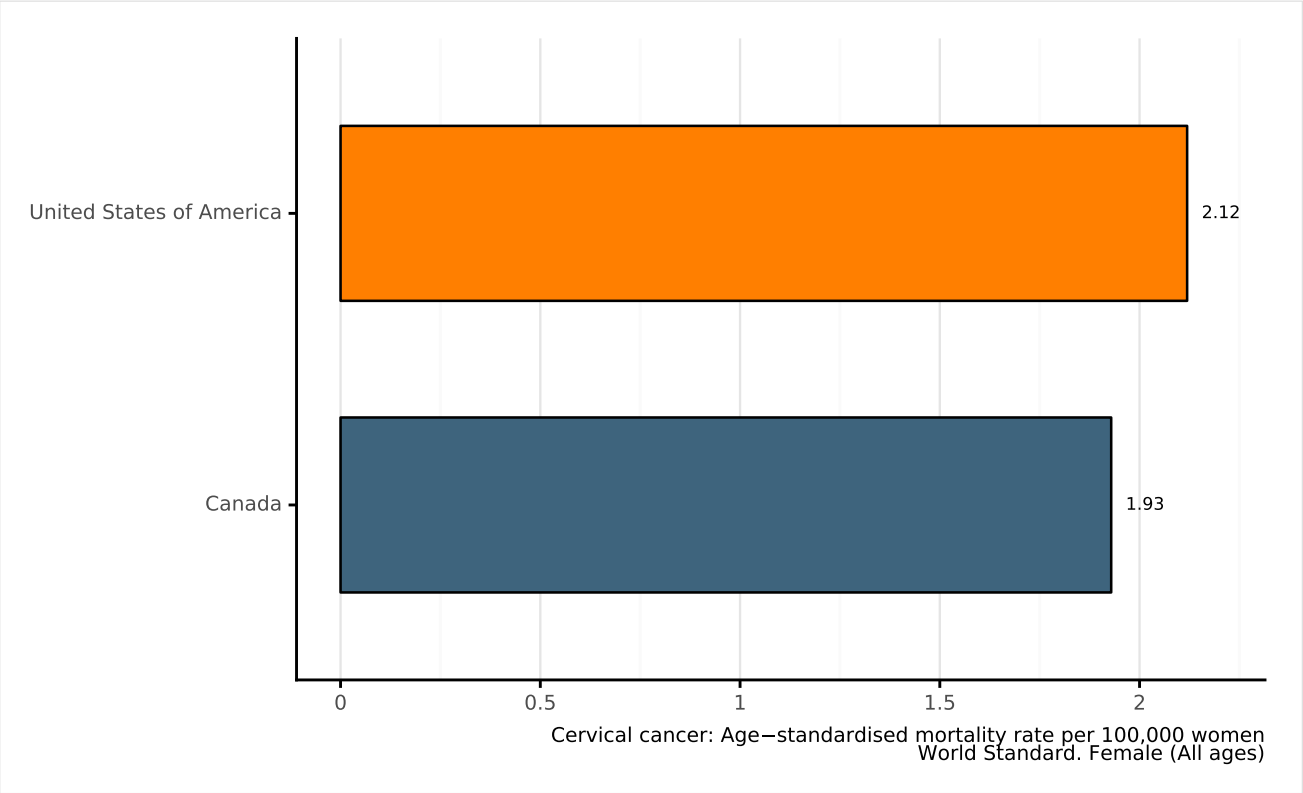
Data Sources:

Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

9.2 Mortality

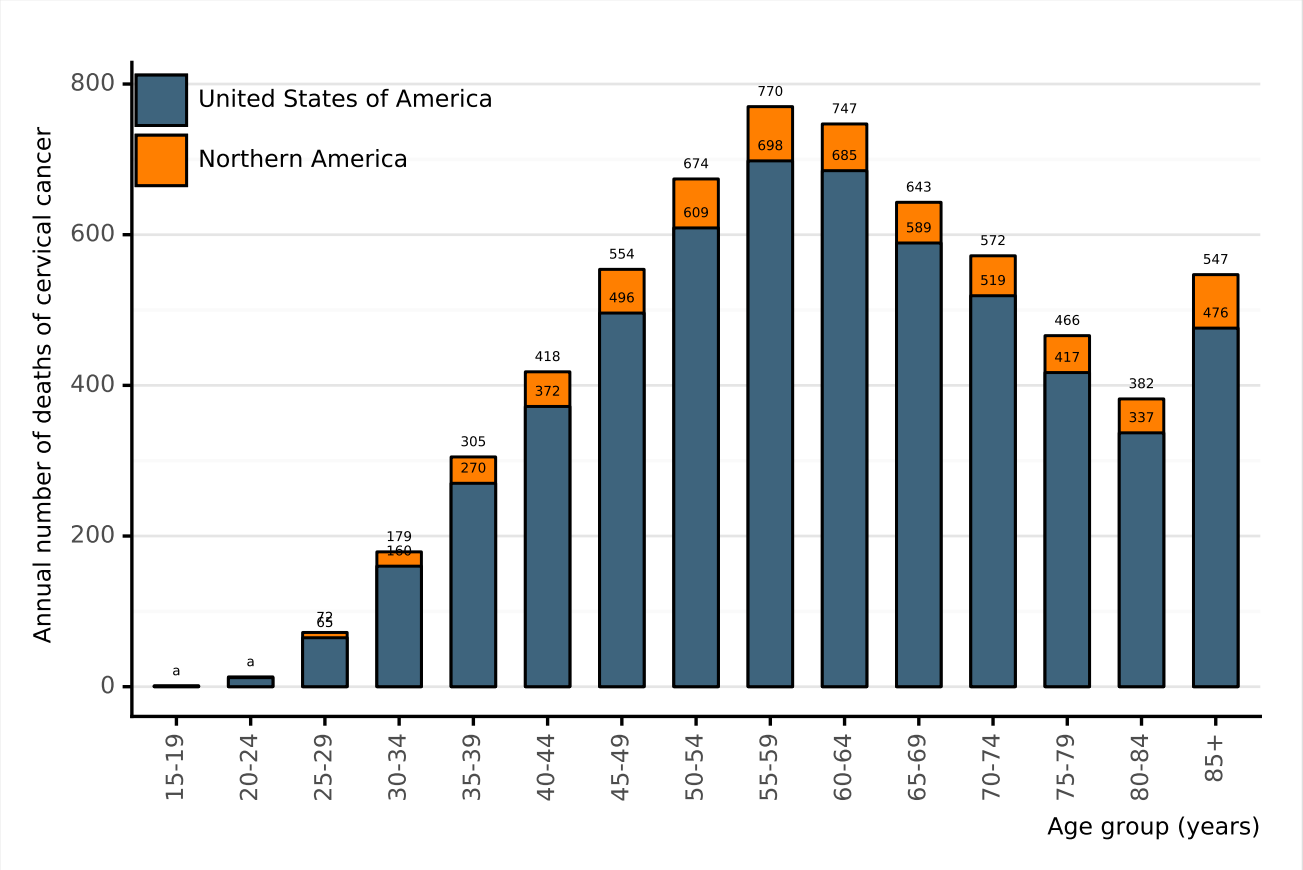
9.2.1 Cervical cancer mortality in United States of America across Northern America

Figure 105: Age-standardised mortality rates of cervical cancer of United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Rates per 100,000 women per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 106: Annual number of deaths of cervical cancer by age group in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021

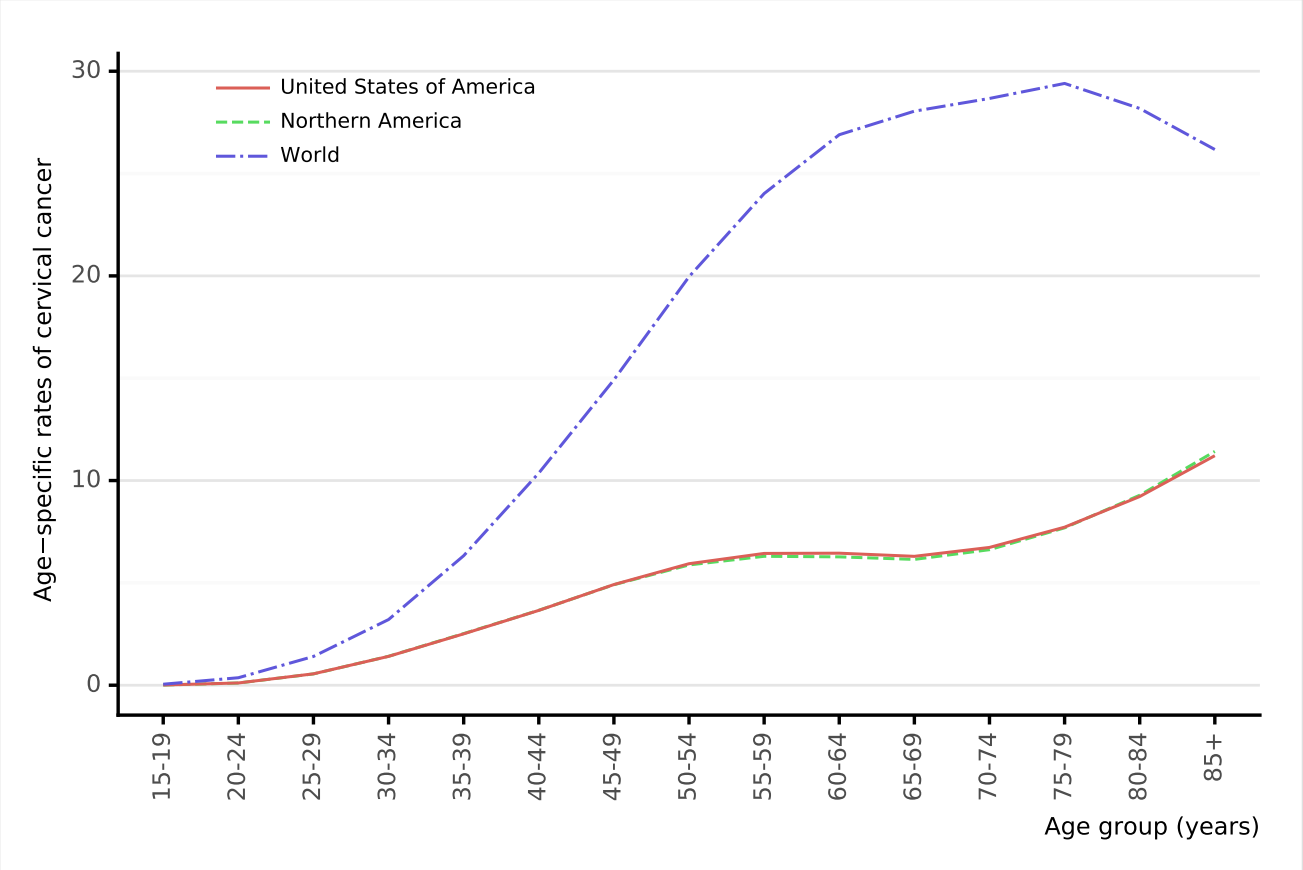
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

[a] 1 cases for United States of America and 1 cases for Northern America in the 15-19 age group. 12 cases for United States of America and 13 cases for Northern America in the 20-24 age group.

Data Sources:

Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 107: Comparison of age-specific cervical cancer mortality rates in United States of America, within the region, and the rest of world



Data accessed on 27 Jan 2021

For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

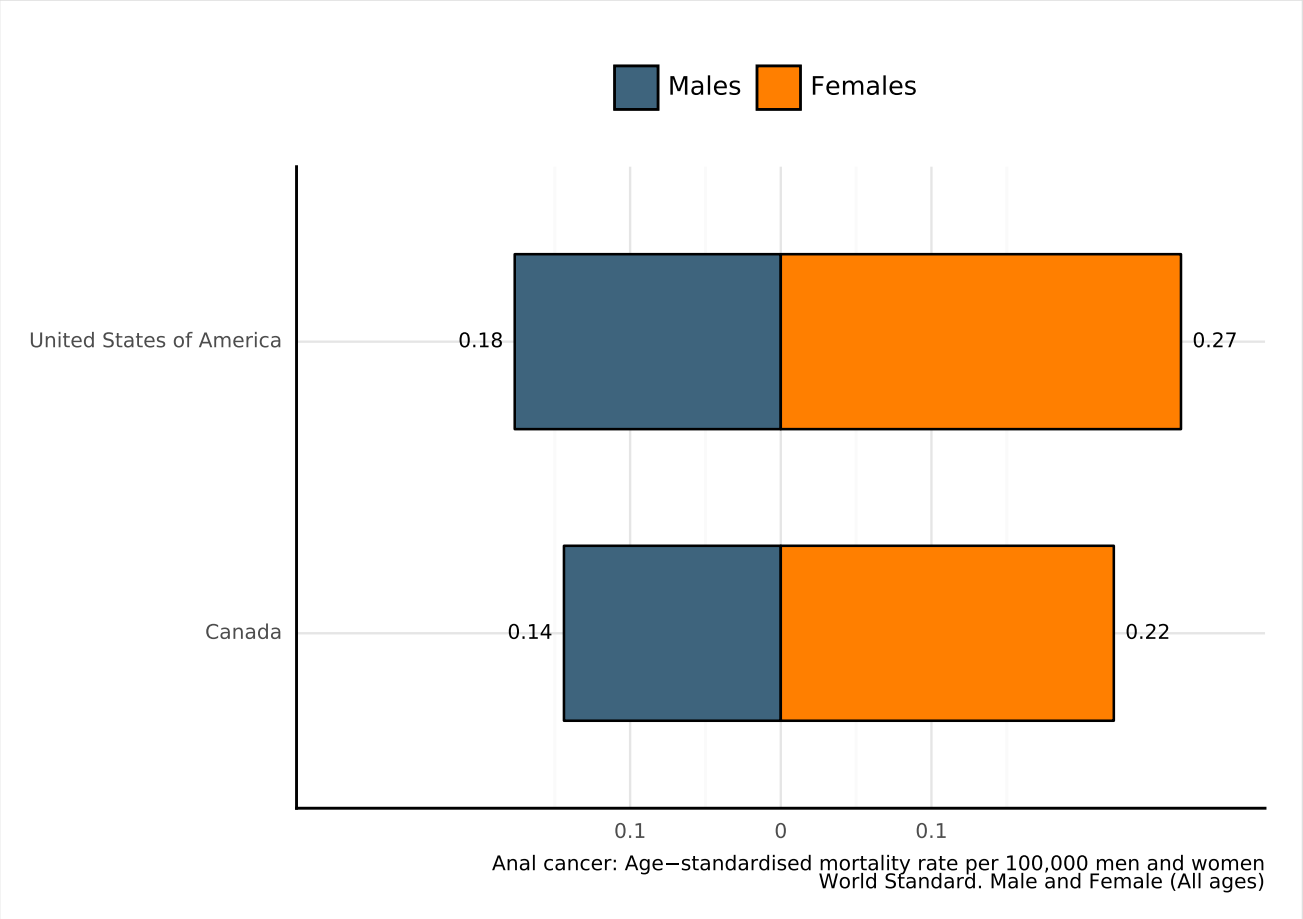
[a] Rates per 100,000 women per year.

Data Sources:

Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

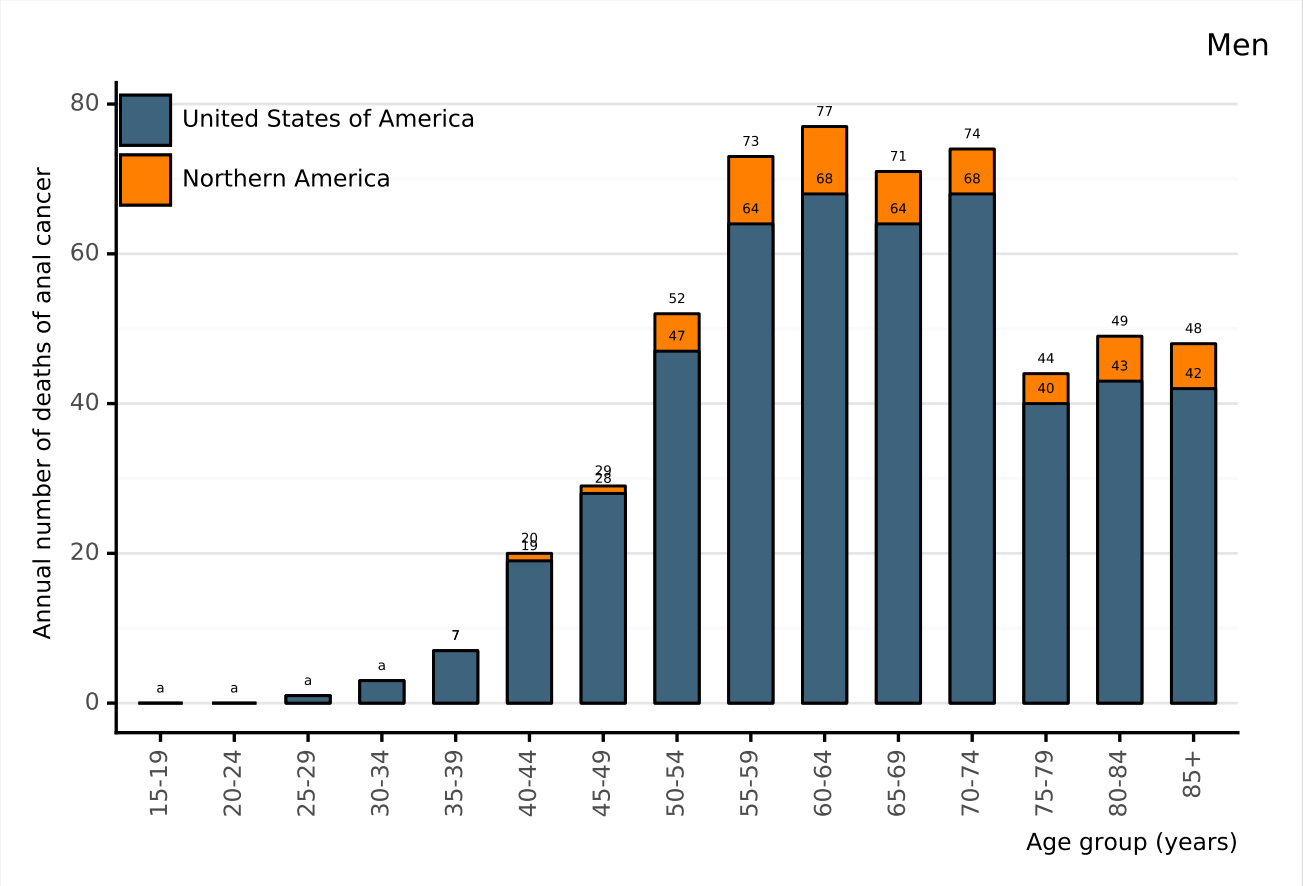
9.2.2 Anal cancer mortality in United States of America across Northern America

Figure 108: Age-standardised mortality rates of anal cancer of United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Rates per 100,000 men per year.
[b] Rates per 100,000 women per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 109: Annual number of deaths of anal cancer among men by age group in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021

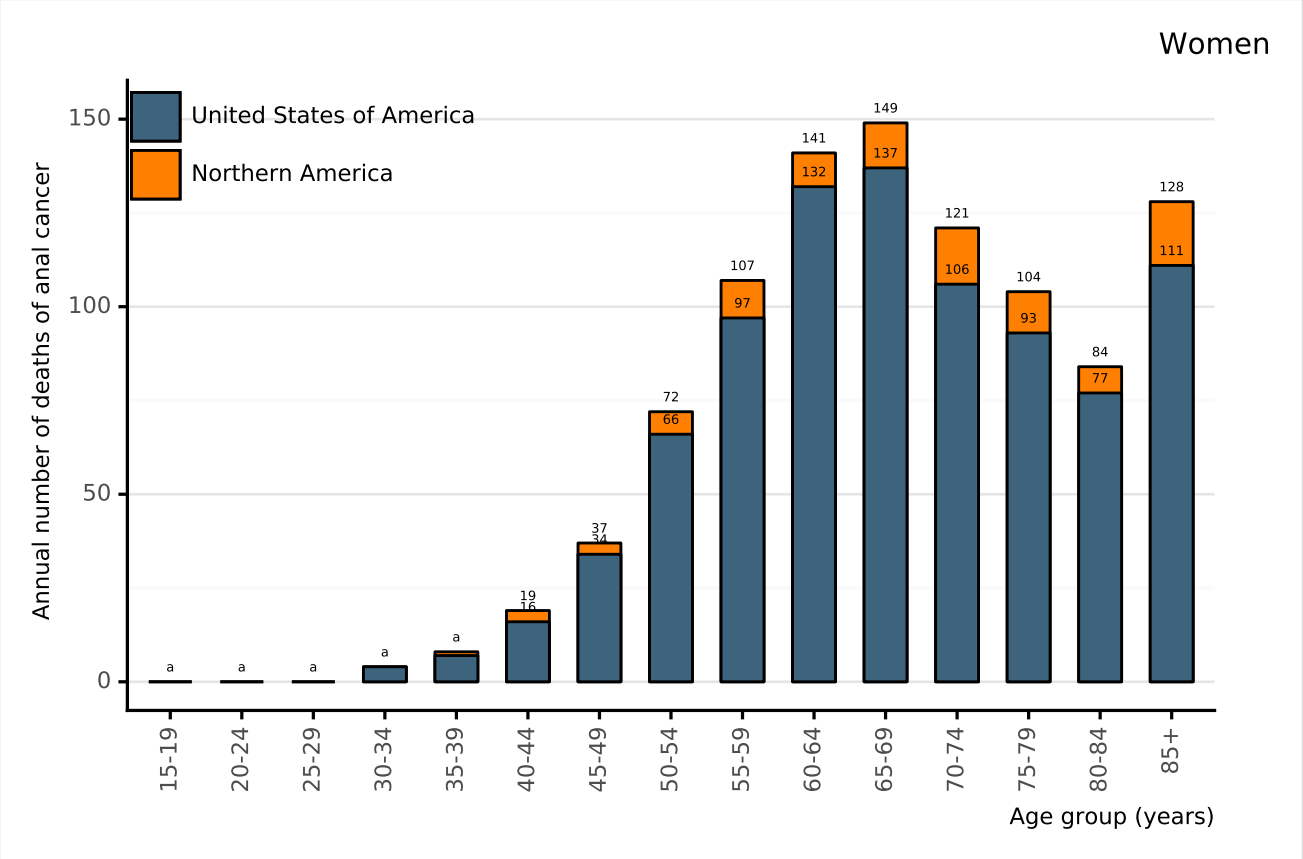
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

[a] 0 cases for United States of America and 0 cases for Northern America in the 15-19 age group. 0 cases for United States of America and 0 cases for Northern America in the 20-24 age group. 1 cases for United States of America and 1 cases for Northern America in the 25-29 age group. 3 cases for United States of America and 3 cases for Northern America in the 30-34 age group.

Data Sources:

Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 110: Annual number of deaths of anal cancer among women by age group in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021

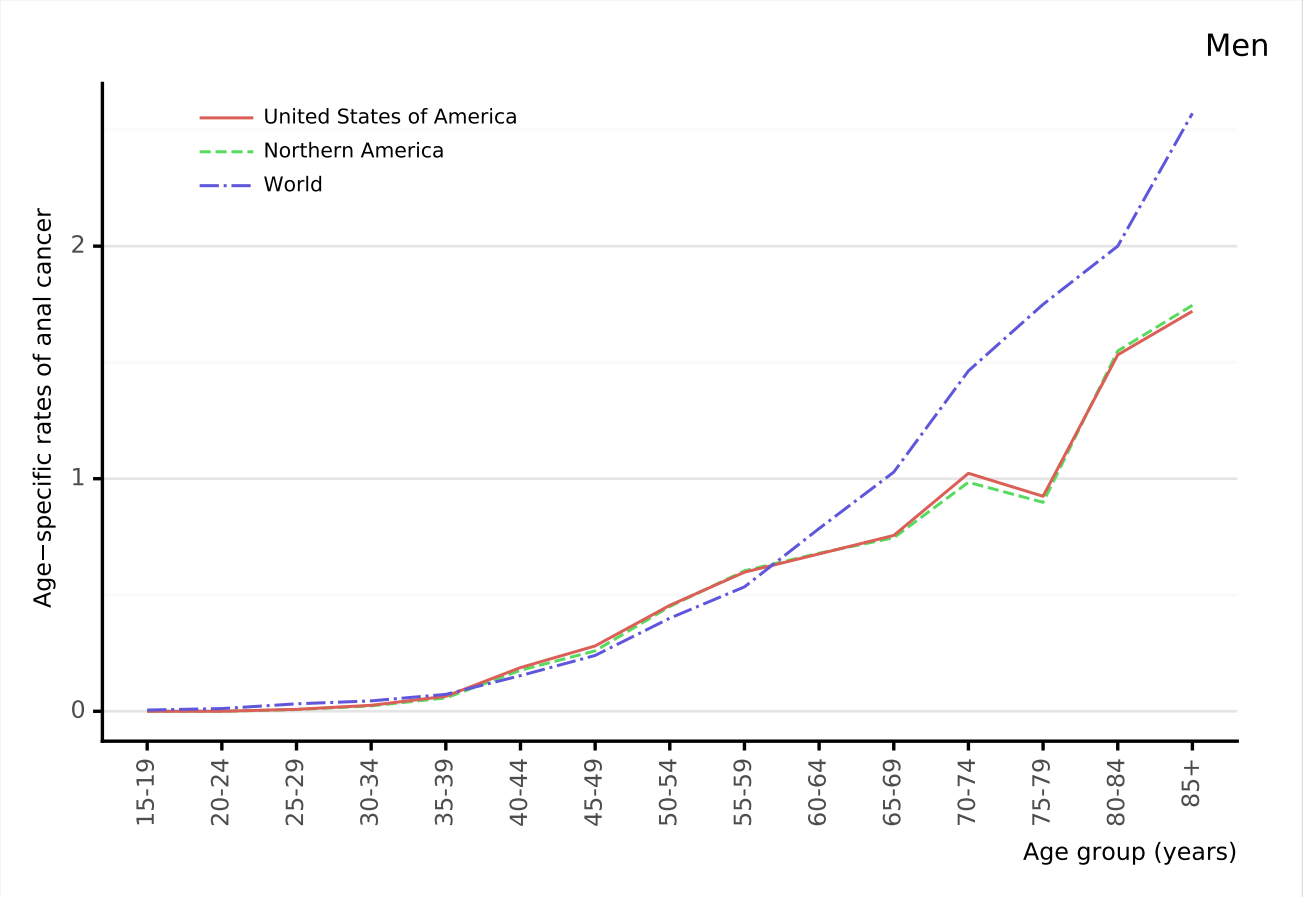
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

[a] 0 cases for United States of America and 0 cases for Northern America in the 15-19 age group. 0 cases for United States of America and 0 cases for Northern America in the 20-24 age group. 0 cases for United States of America and 0 cases for Northern America in the 25-29 age group. 4 cases for United States of America and 4 cases for Northern America in the 30-34 age group. 7 cases for United States of America and 8 cases for Northern America in the 35-39 age group.

Data Sources:

Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 111: Comparison of age-specific anal cancer mortality rates among men by age in United States of America, within the region, and the rest of world



Data accessed on 27 Jan 2021

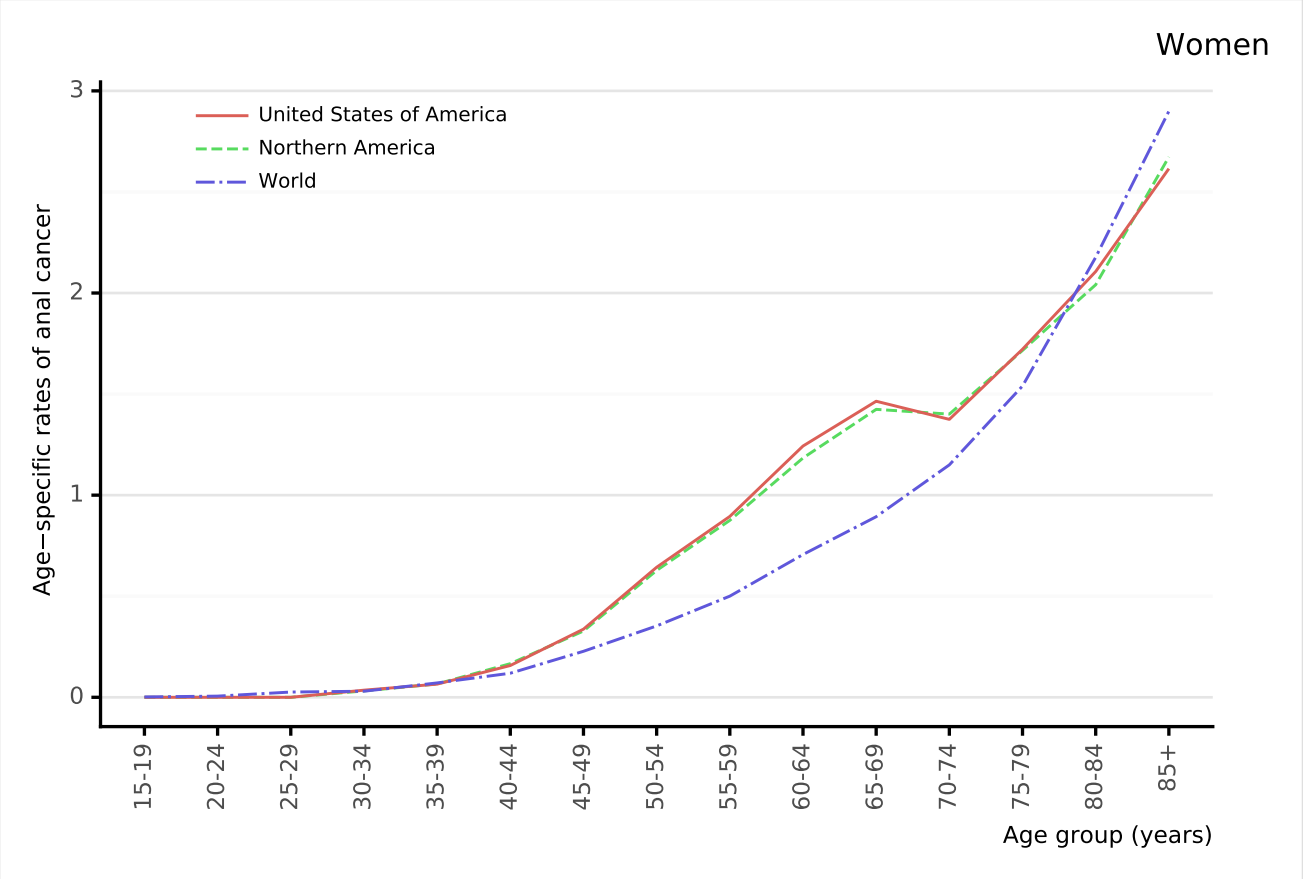
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

[a] Rates per 100,000 men per year.

Data Sources:

Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 112: Comparison of age-specific anal cancer mortality rates among women by age in United States of America, within the region, and the rest of world



Data accessed on 27 Jan 2021

For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

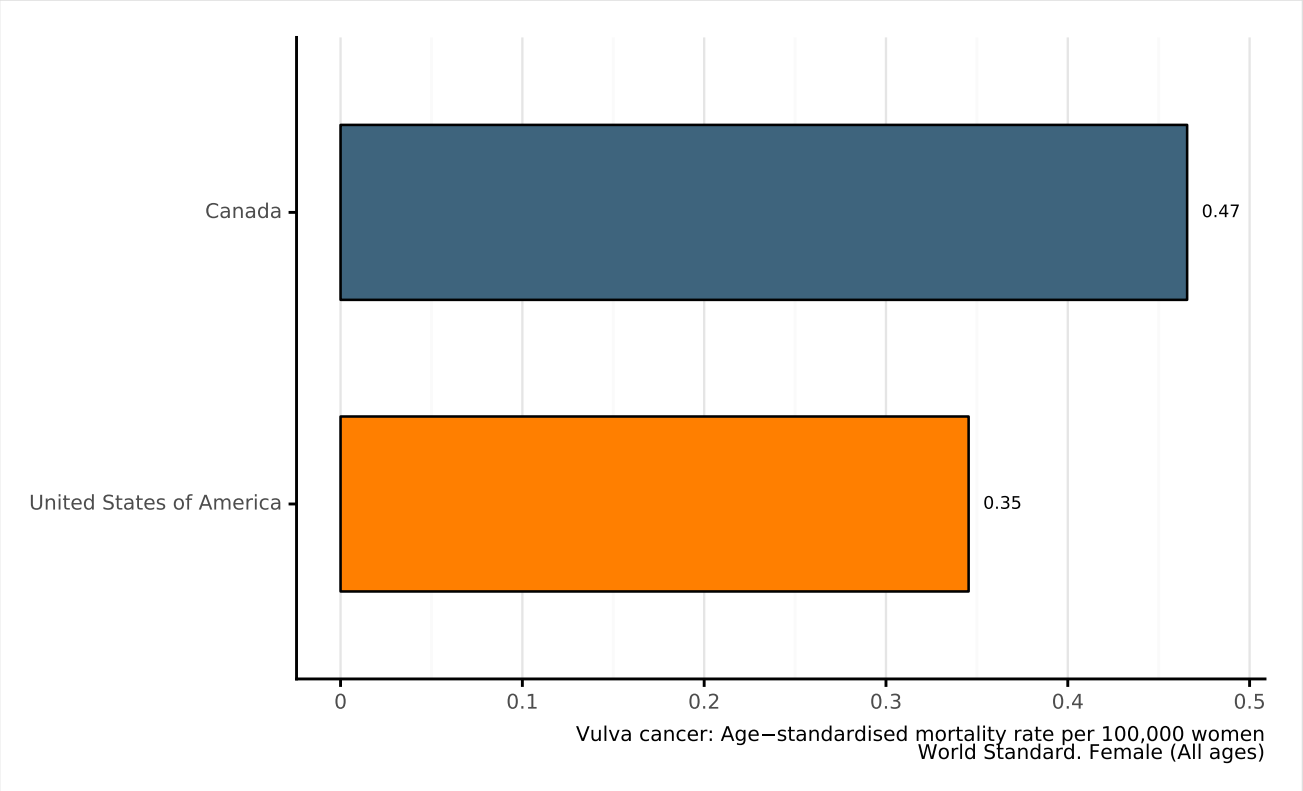
[a] Rates per 100,000 women per year.

Data Sources:

Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

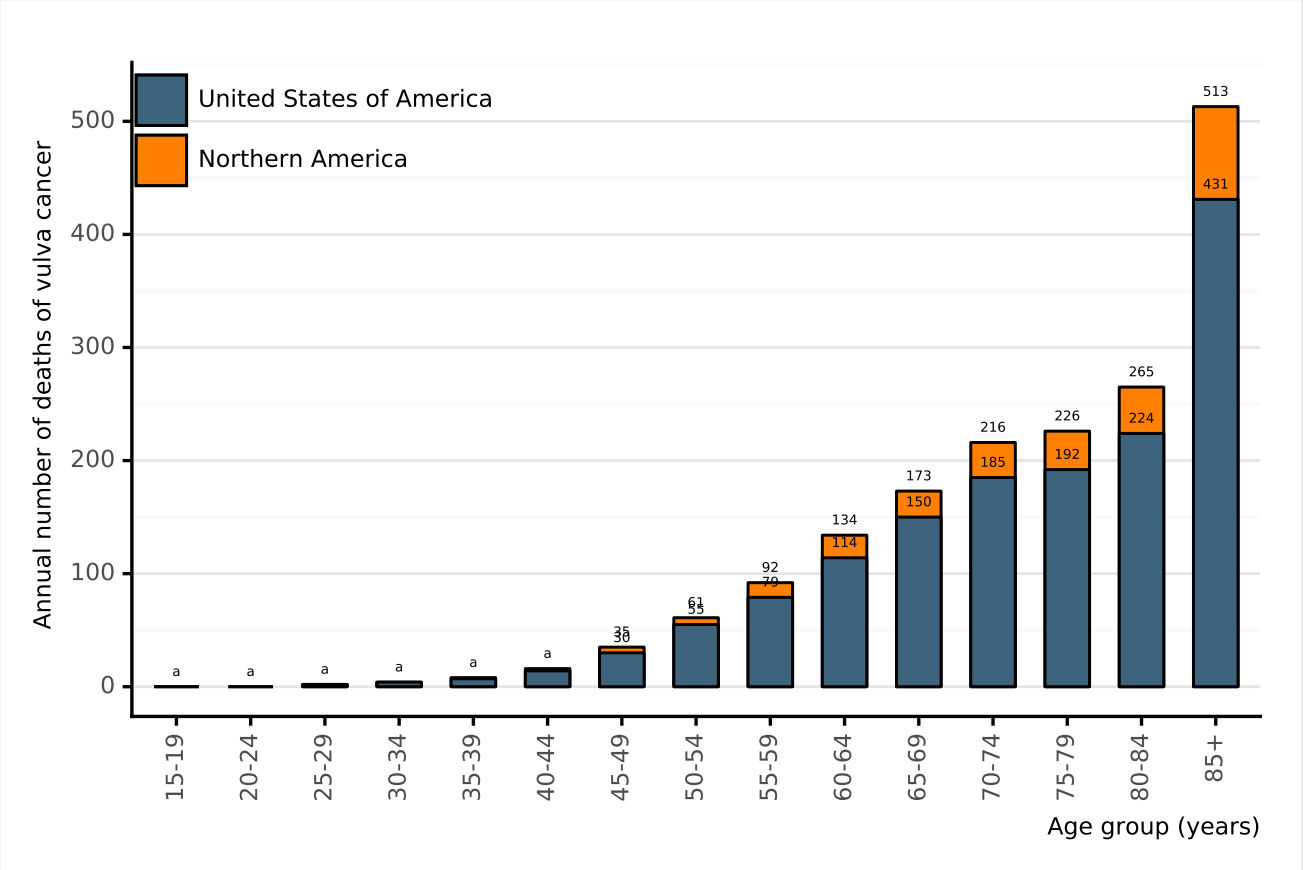
9.2.3 Vulva cancer mortality in United States of America across Northern America

Figure 113: Age-standardised mortality rates of vulva cancer of United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Rates per 100,000 women per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 114: Annual number of deaths of vulva cancer by age group in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021

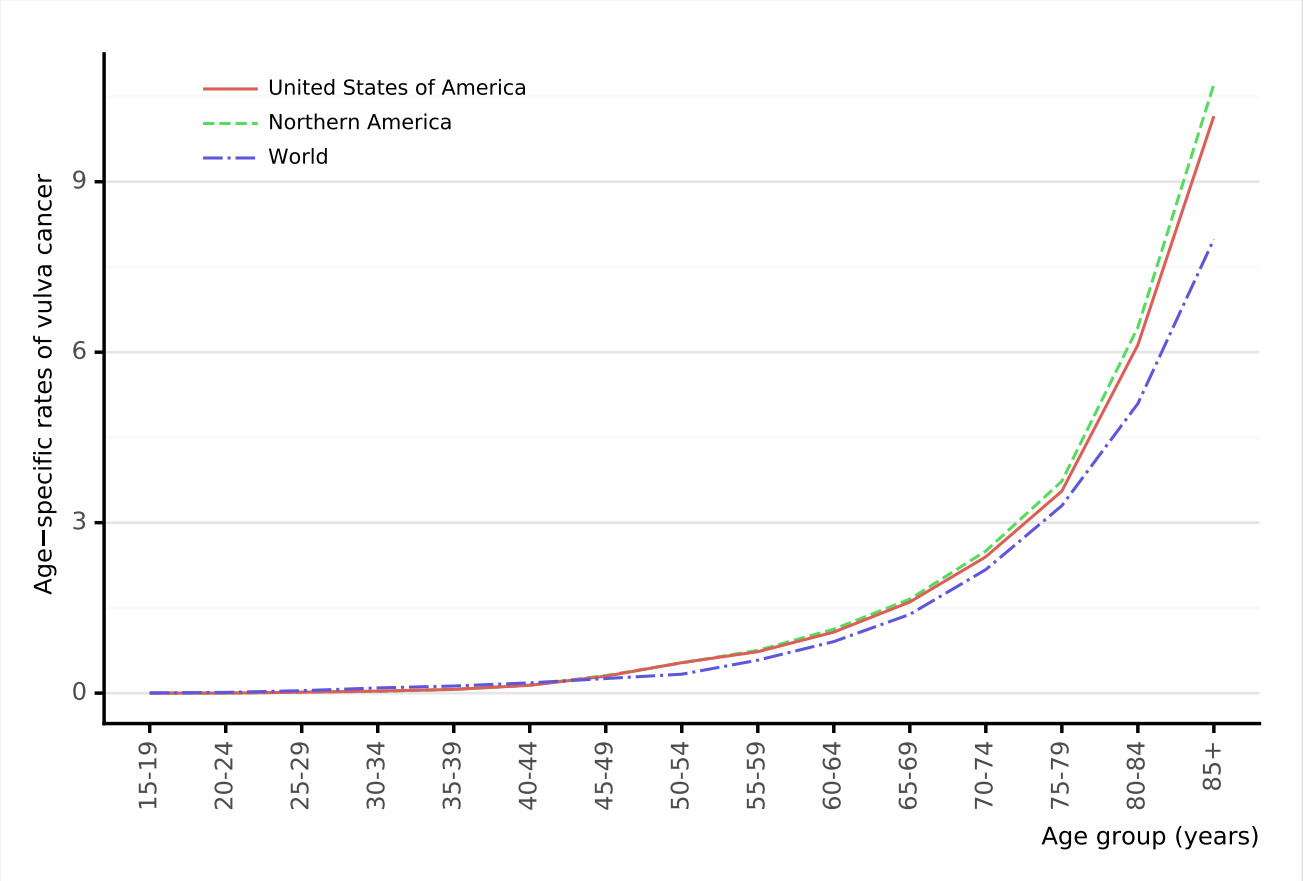
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

[a] 0 cases for United States of America and 0 cases for Northern America in the 15-19 age group. 0 cases for United States of America and 0 cases for Northern America in the 20-24 age group. 2 cases for United States of America and 2 cases for Northern America in the 25-29 age group. 4 cases for United States of America and 4 cases for Northern America in the 30-34 age group. 7 cases for United States of America and 8 cases for Northern America in the 35-39 age group. 14 cases for United States of America and 16 cases for Northern America in the 40-44 age group.

Data Sources:

Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

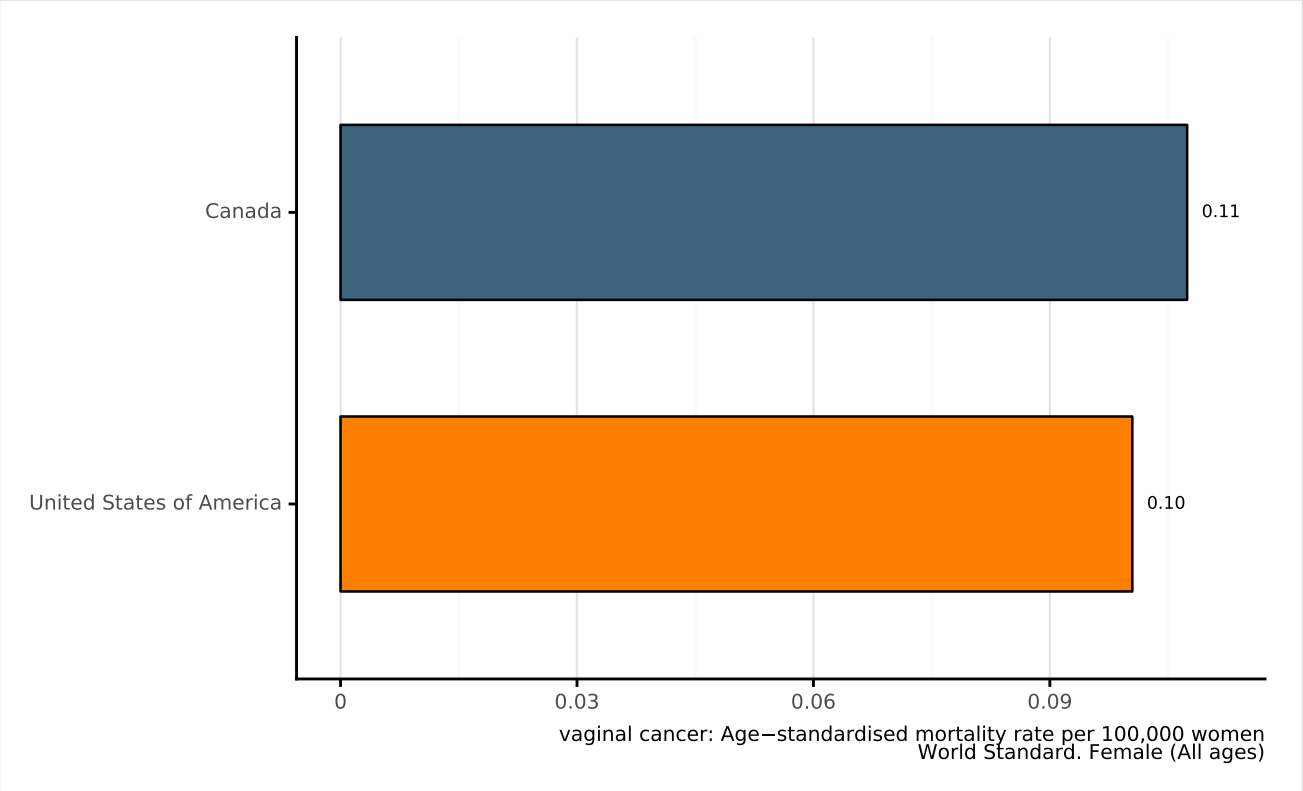
Figure 115: Comparison of age-specific vulva cancer mortality rates in United States of America, within the region, and the rest of world



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Rates per 100,000 women per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

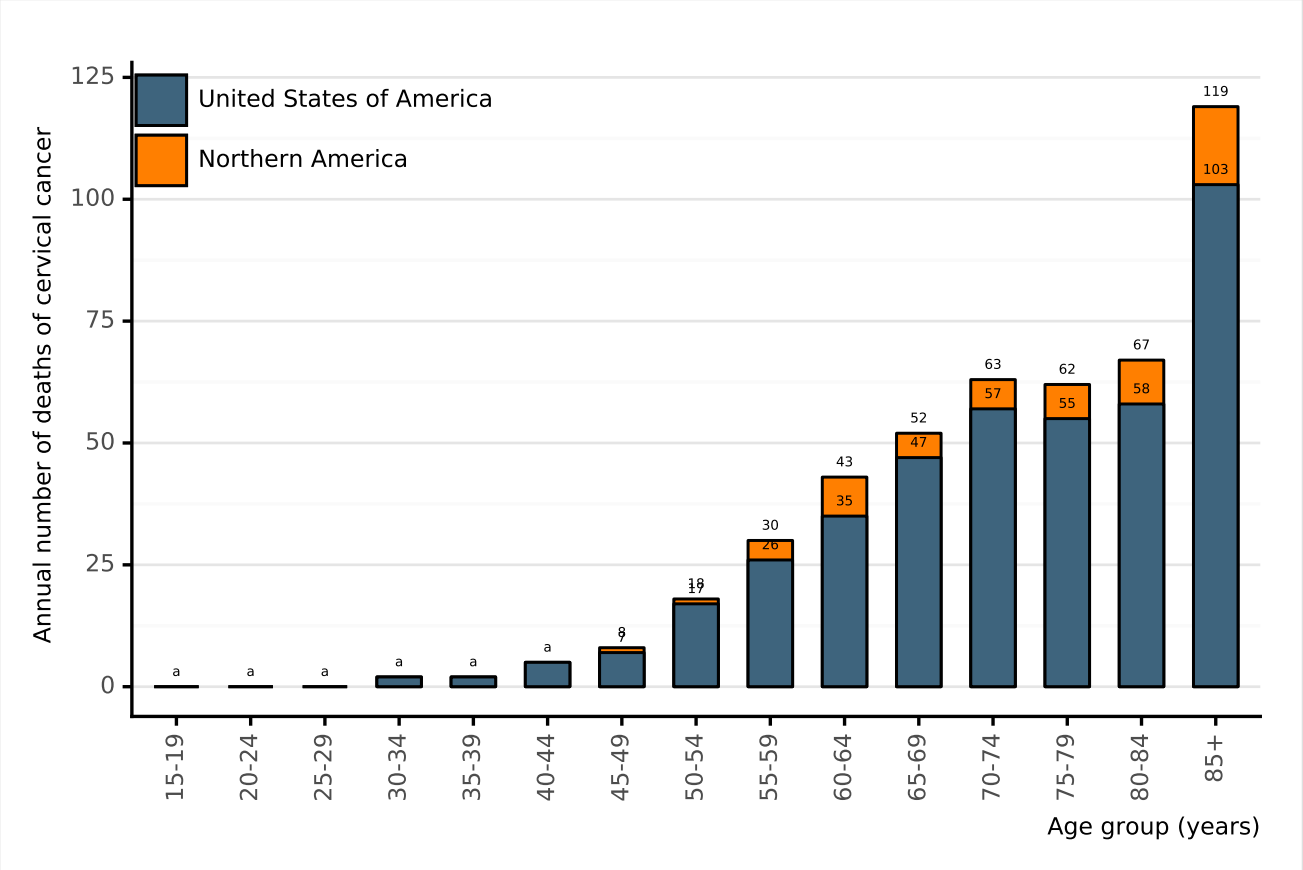
9.2.4 Vaginal cancer mortality in United States of America across Northern America

Figure 116: Age-standardised mortality rates of vaginal cancer of United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Rates per 100,000 women per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 117: Annual number of deaths of cervical cancer by age group in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021

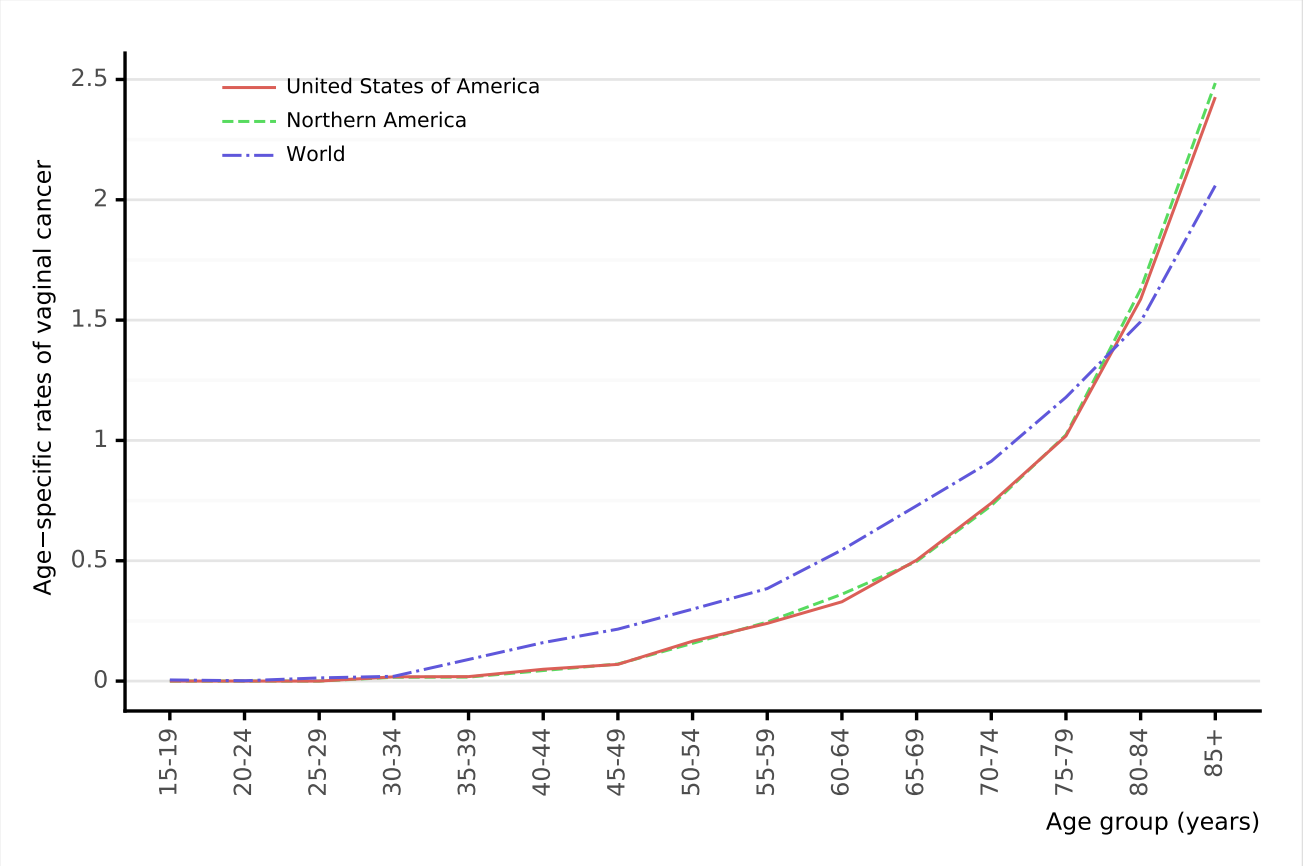
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

[a] 0 cases for United States of America and 0 cases for Northern America in the 15-19 age group. 0 cases for United States of America and 0 cases for Northern America in the 20-24 age group. 0 cases for United States of America and 0 cases for Northern America in the 25-29 age group. 2 cases for United States of America and 2 cases for Northern America in the 30-34 age group. 2 cases for United States of America and 2 cases for Northern America in the 35-39 age group. 5 cases for United States of America and 5 cases for Northern America in the 40-44 age group.

Data Sources:

Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 118: Comparison of age-specific vaginal cancer mortality rates in United States of America, within the region, and the rest of world



Data accessed on 27 Jan 2021

For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

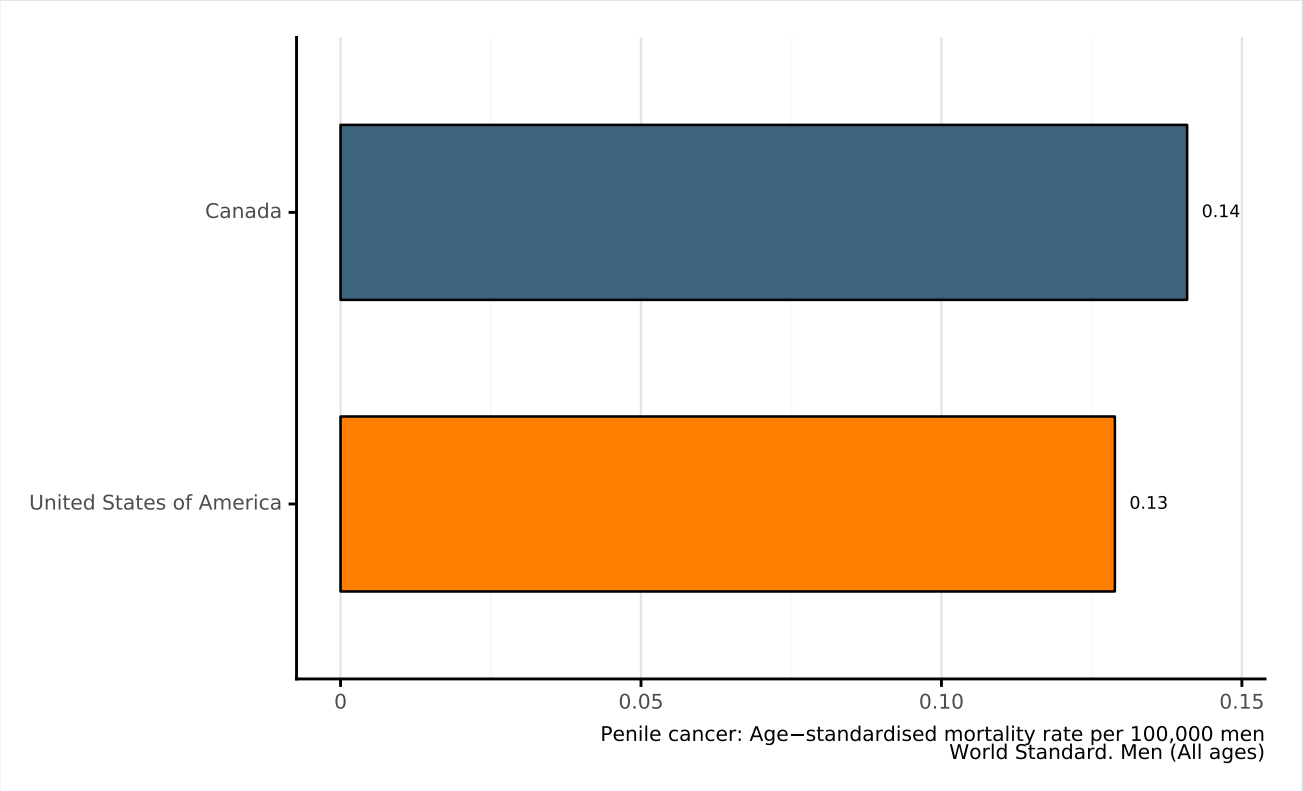
[a] Rates per 100,000 women per year.

Data Sources:

Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

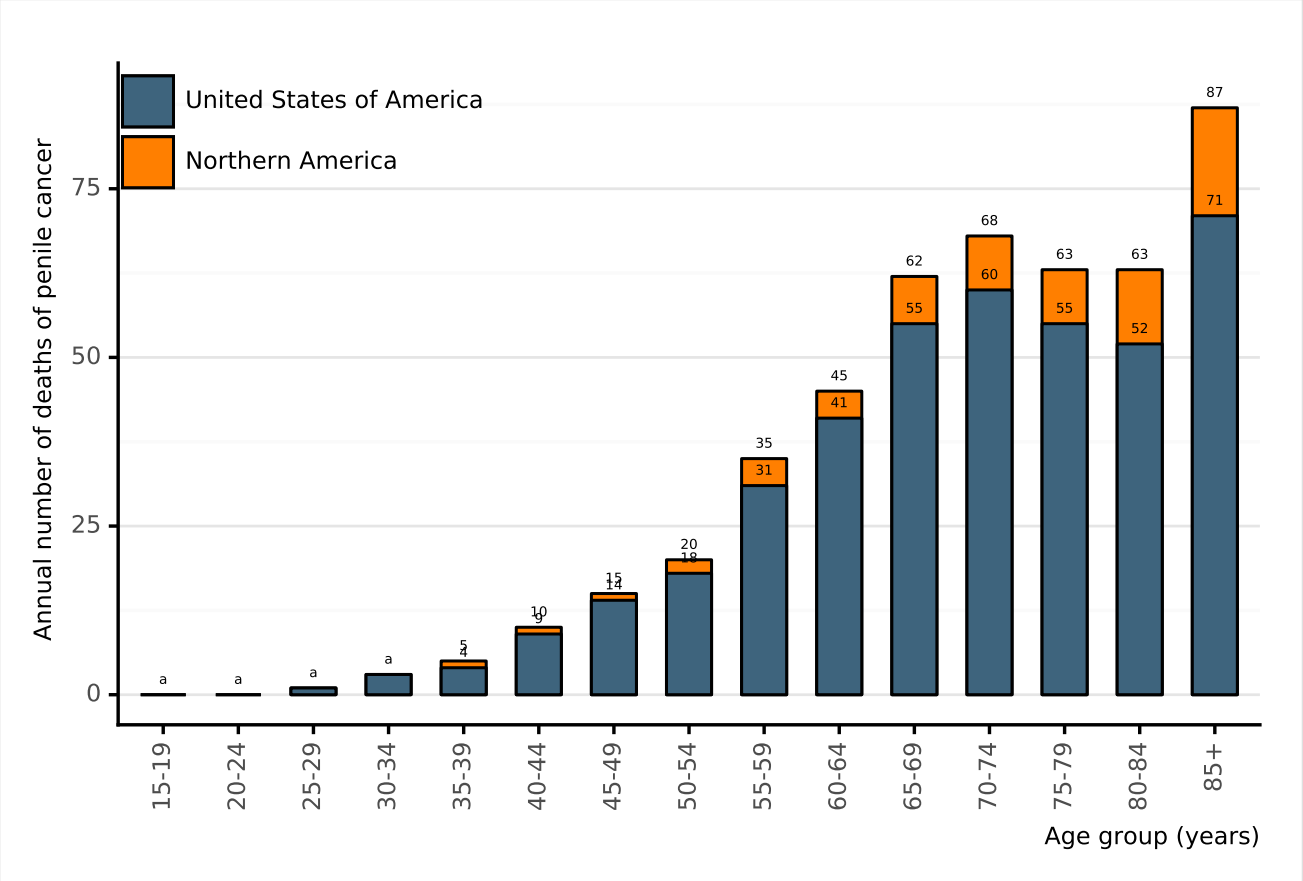
9.2.5 Penile cancer mortality in United States of America across Northern America

Figure 119: Age-standardised mortality rates of penile cancer of United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Rates per 100,000 men per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 120: Annual number of new deaths of penile cancer by age group in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021

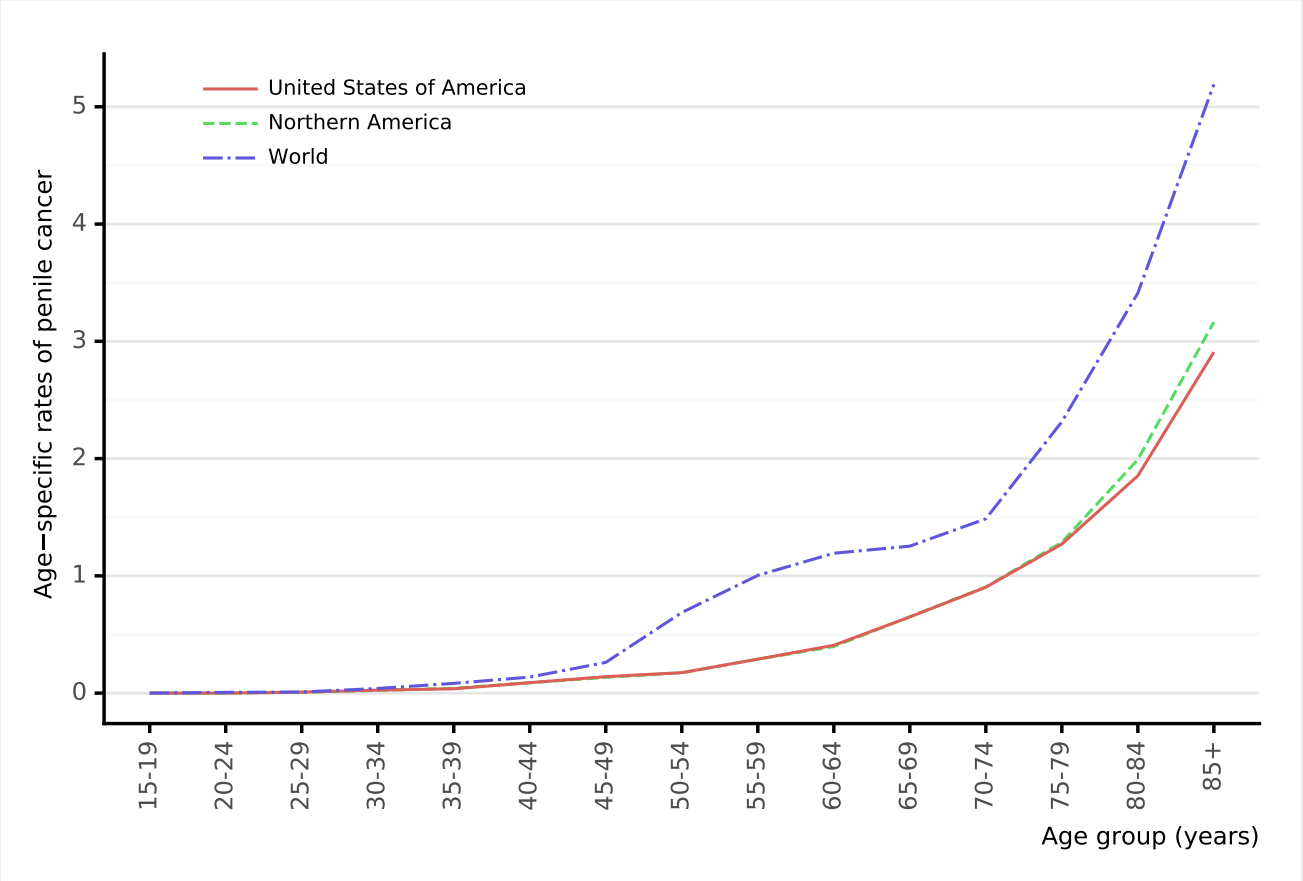
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

[a] 0 cases for United States of America and 0 cases for Northern America in the 15-19 age group. 0 cases for United States of America and 0 cases for Northern America in the 20-24 age group. 1 cases for United States of America and 1 cases for Northern America in the 25-29 age group. 3 cases for United States of America and 3 cases for Northern America in the 30-34 age group.

Data Sources:

Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

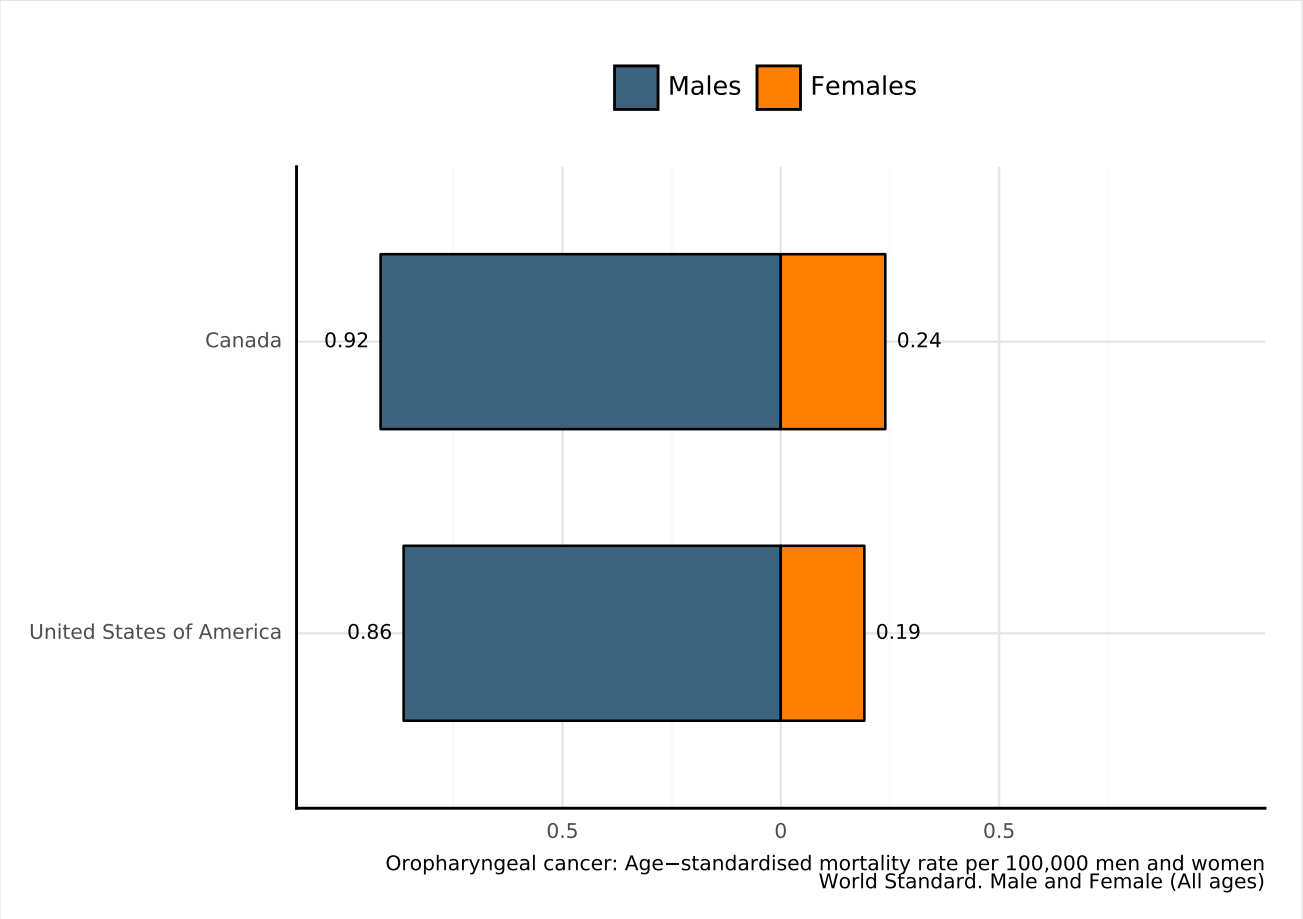
Figure 121: Comparison of age-specific penile cancer mortality rates in United States of America, within the region, and the rest of world



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Rates per 100,000 men per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

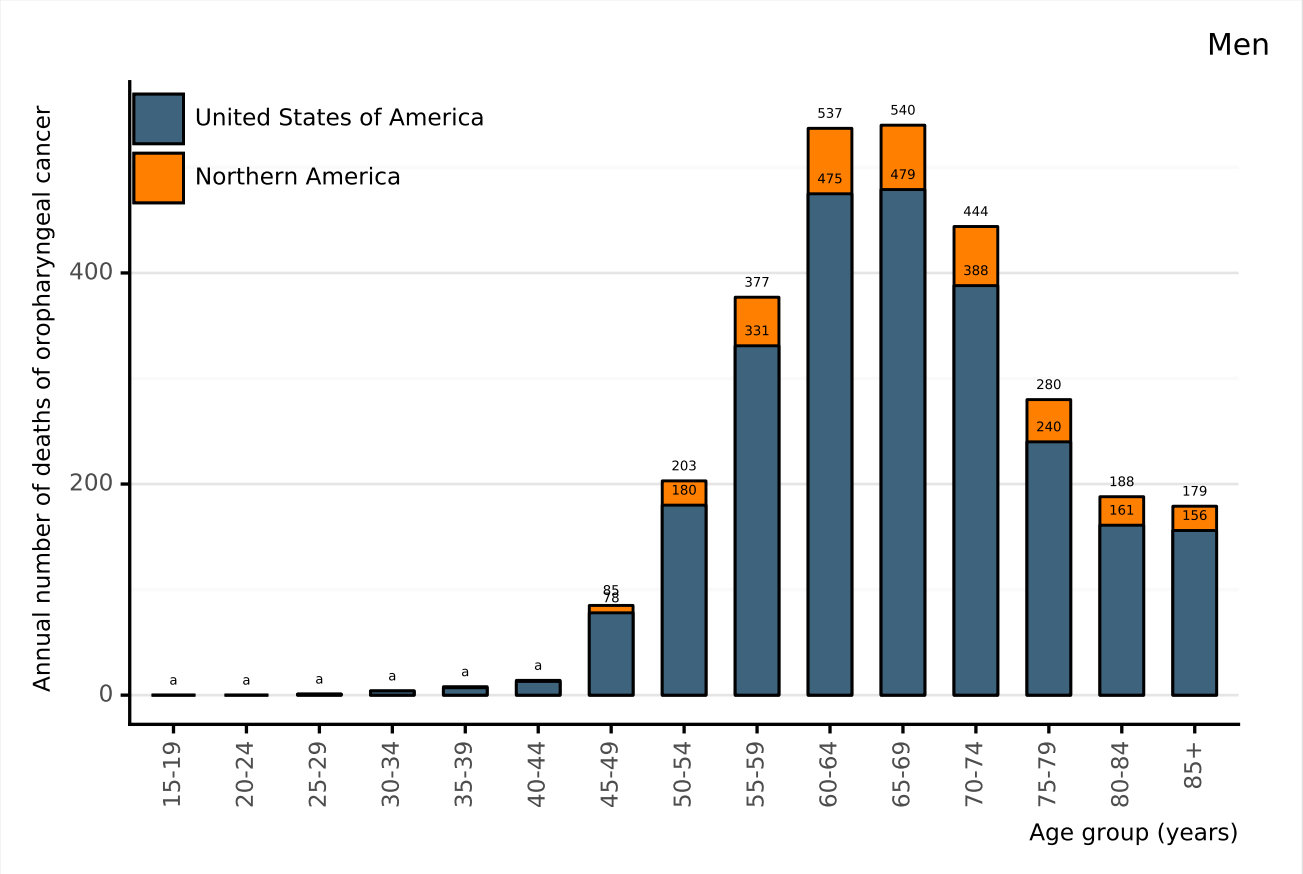
9.2.6 Oropharyngeal cancer mortality in United States of America across Northern America

Figure 122: Age-standardised mortality rates of oropharyngeal cancer of United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Rates per 100,000 men per year.
[b] Rates per 100,000 women per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 123: Annual number of deaths of oropharyngeal cancer among men by age group in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021

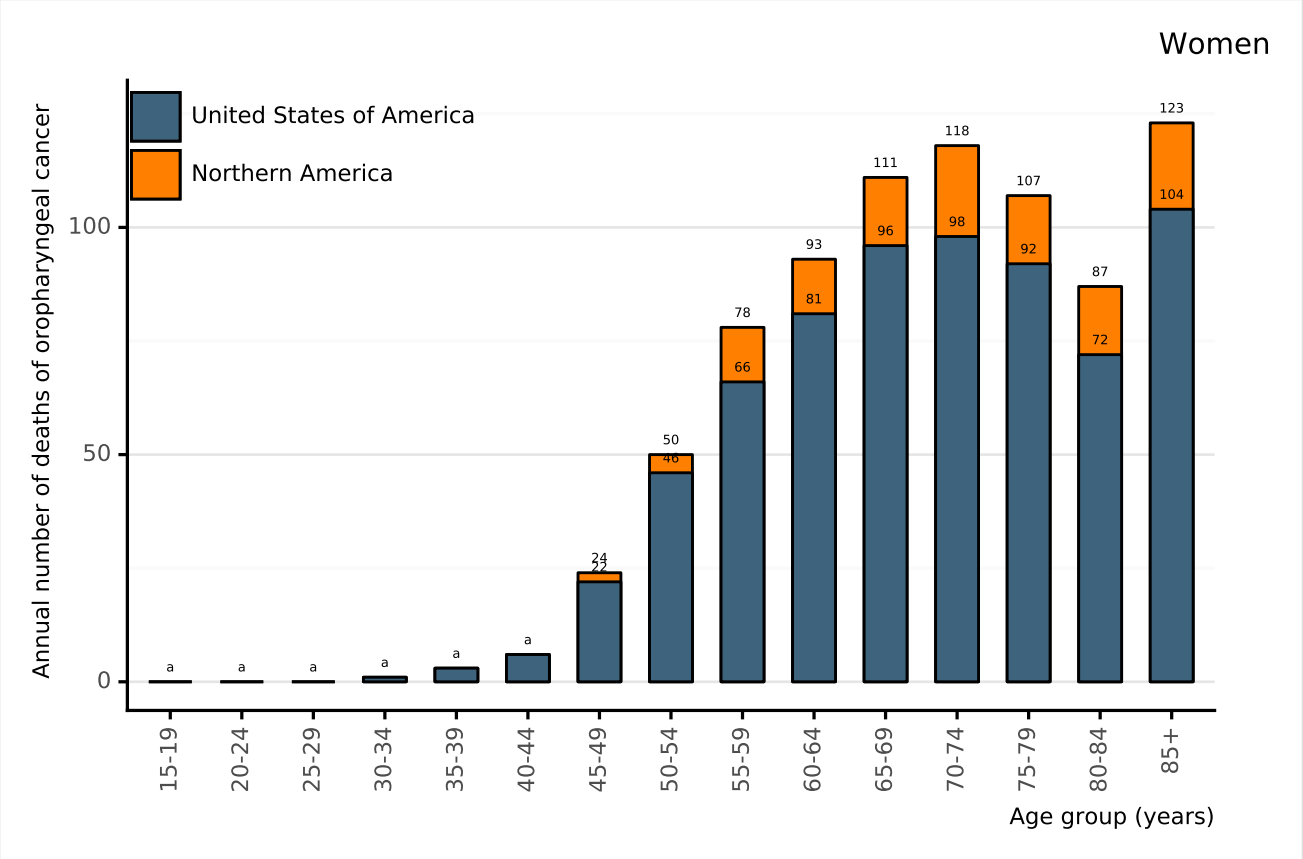
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

[a] 0 cases for United States of America and 0 cases for Northern America in the 15-19 age group. 0 cases for United States of America and 0 cases for Northern America in the 20-24 age group. 1 cases for United States of America and 1 cases for Northern America in the 25-29 age group. 4 cases for United States of America and 4 cases for Northern America in the 30-34 age group. 7 cases for United States of America and 8 cases for Northern America in the 35-39 age group. 13 cases for United States of America and 14 cases for Northern America in the 40-44 age group.

Data Sources:

Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 124: Annual number of deaths of oropharyngeal cancer among women by age group in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021

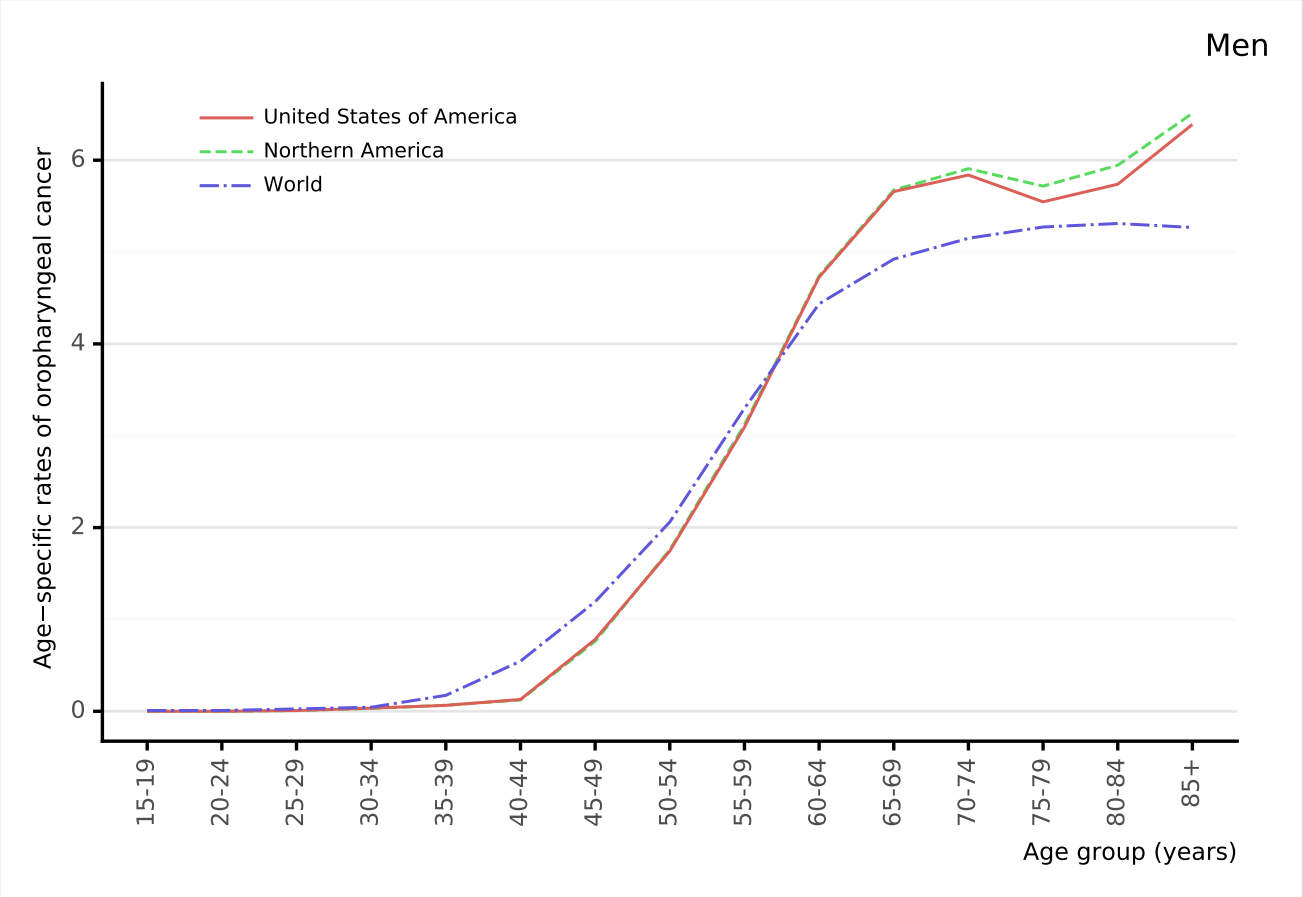
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

[a] 0 cases for United States of America and 0 cases for Northern America in the 15-19 age group. 0 cases for United States of America and 0 cases for Northern America in the 20-24 age group. 0 cases for United States of America and 0 cases for Northern America in the 25-29 age group. 1 cases for United States of America and 1 cases for Northern America in the 30-34 age group. 3 cases for United States of America and 3 cases for Northern America in the 35-39 age group. 6 cases for United States of America and 6 cases for Northern America in the 40-44 age group.

Data Sources:

Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 125: Comparison of age-specific oropharyngeal cancer mortality rates among men by age in United States of America, within the region, and the rest of world



Data accessed on 27 Jan 2021

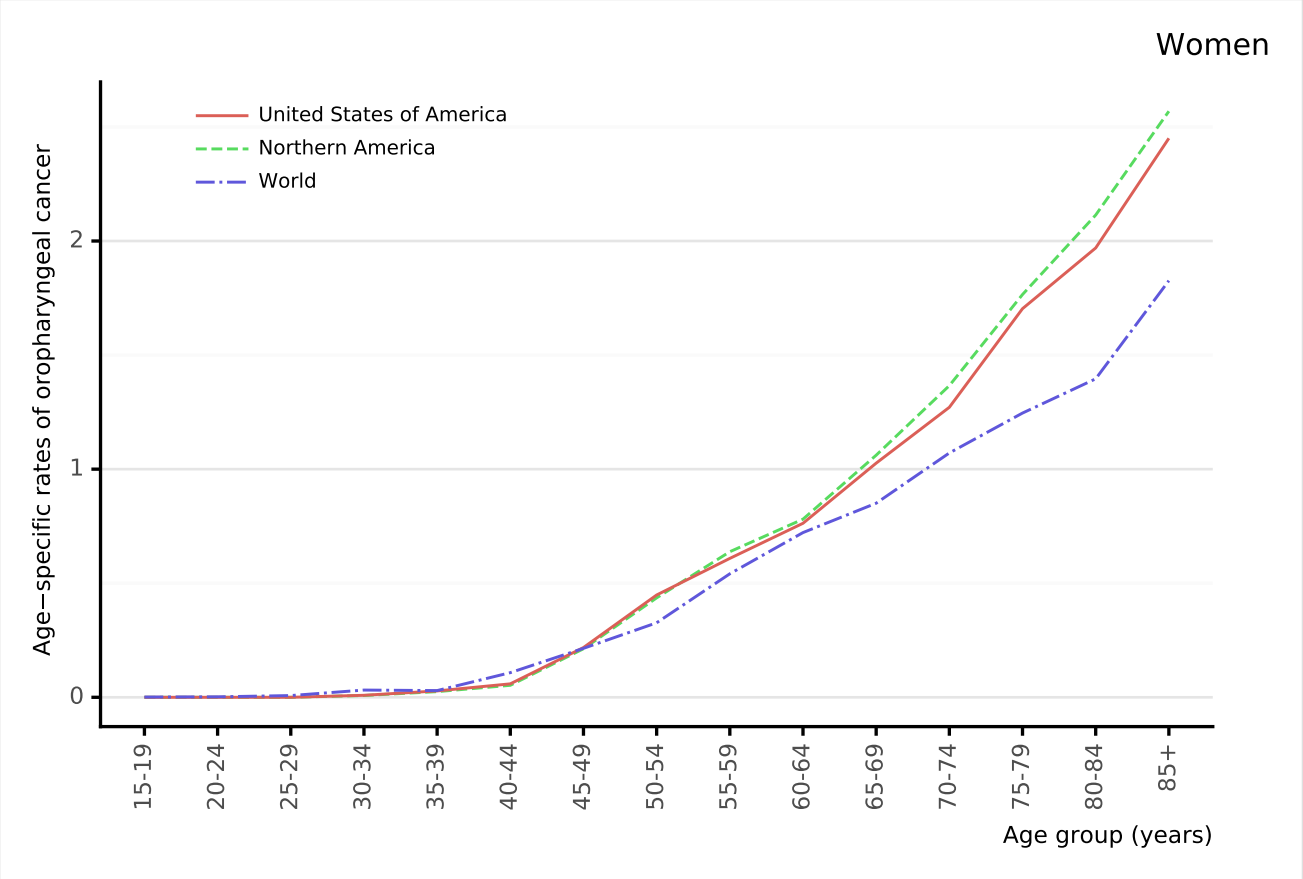
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

[a] Rates per 100,000 men per year.

Data Sources:

Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 126: Comparison of age-specific oropharyngeal cancer mortality rates among women by age in United States of America, within the region, and the rest of world



Data accessed on 27 Jan 2021

For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

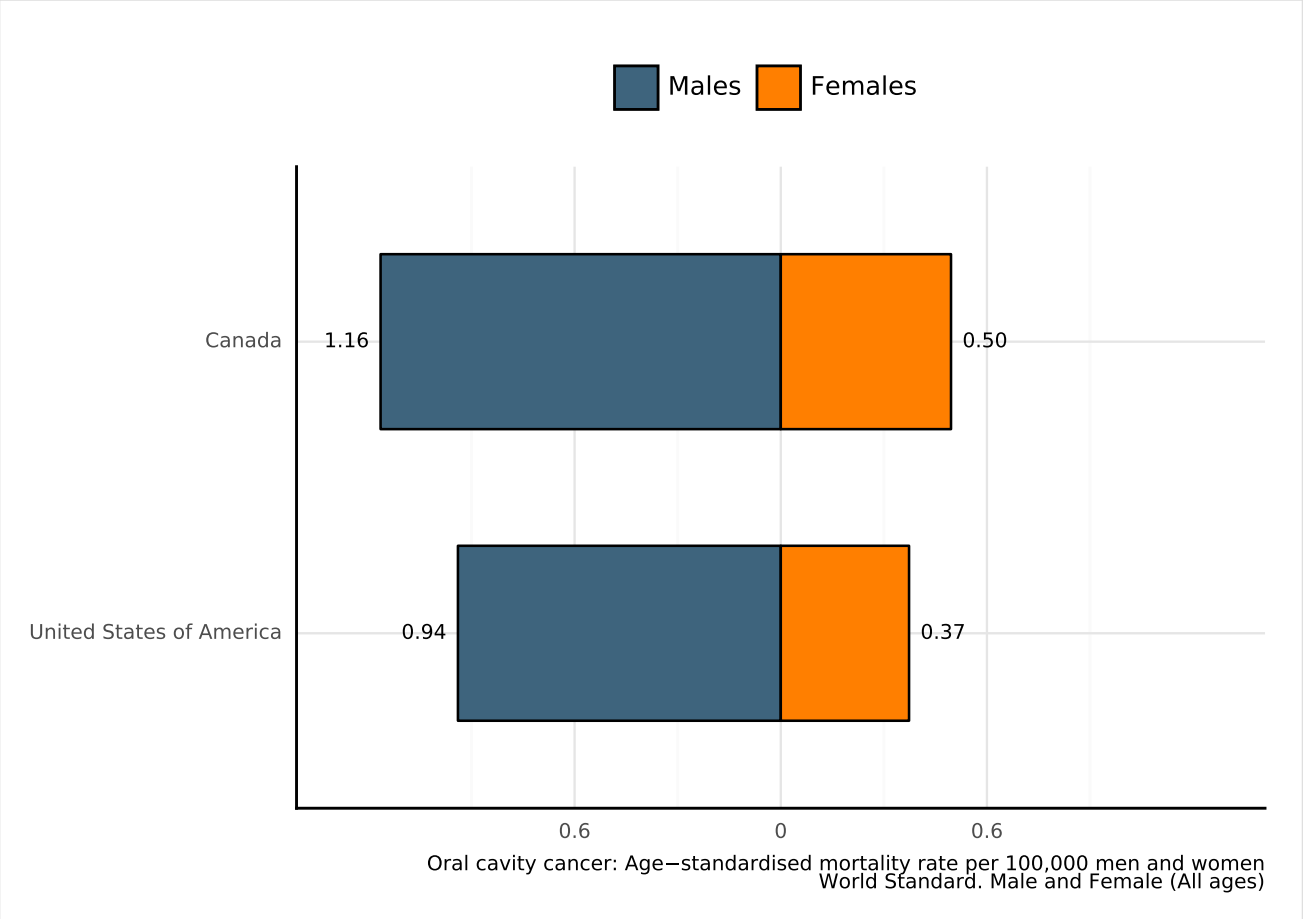
[a] Rates per 100,000 women per year.

Data Sources:

Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

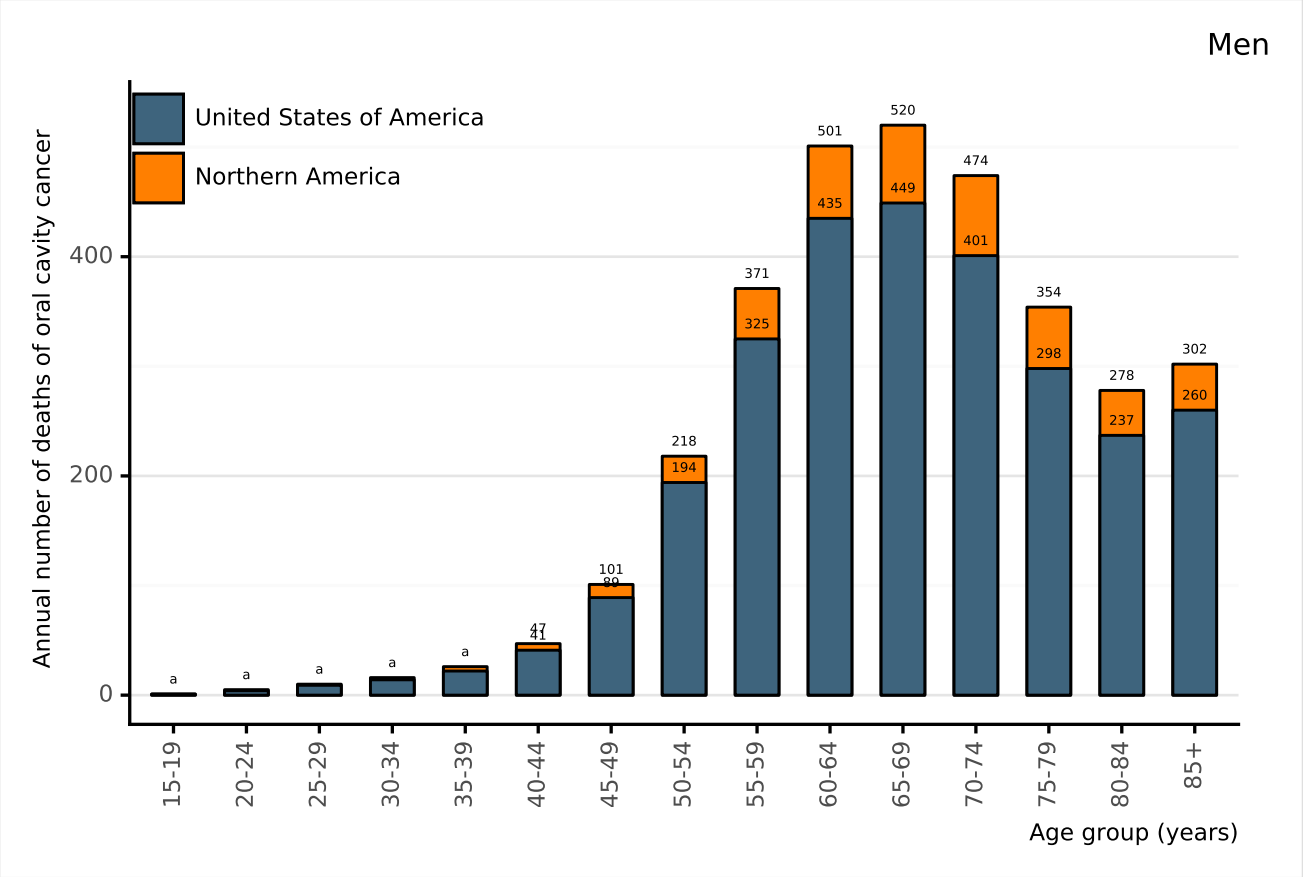
9.2.7 Oral cavity cancer mortality in United States of America across Northern America

Figure 127: Age-standardised mortality rates of oral cavity cancer of United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Rates per 100,000 men per year.
[b] Rates per 100,000 women per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 128: Annual number of deaths of oral cavity cancer among men by age group in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021

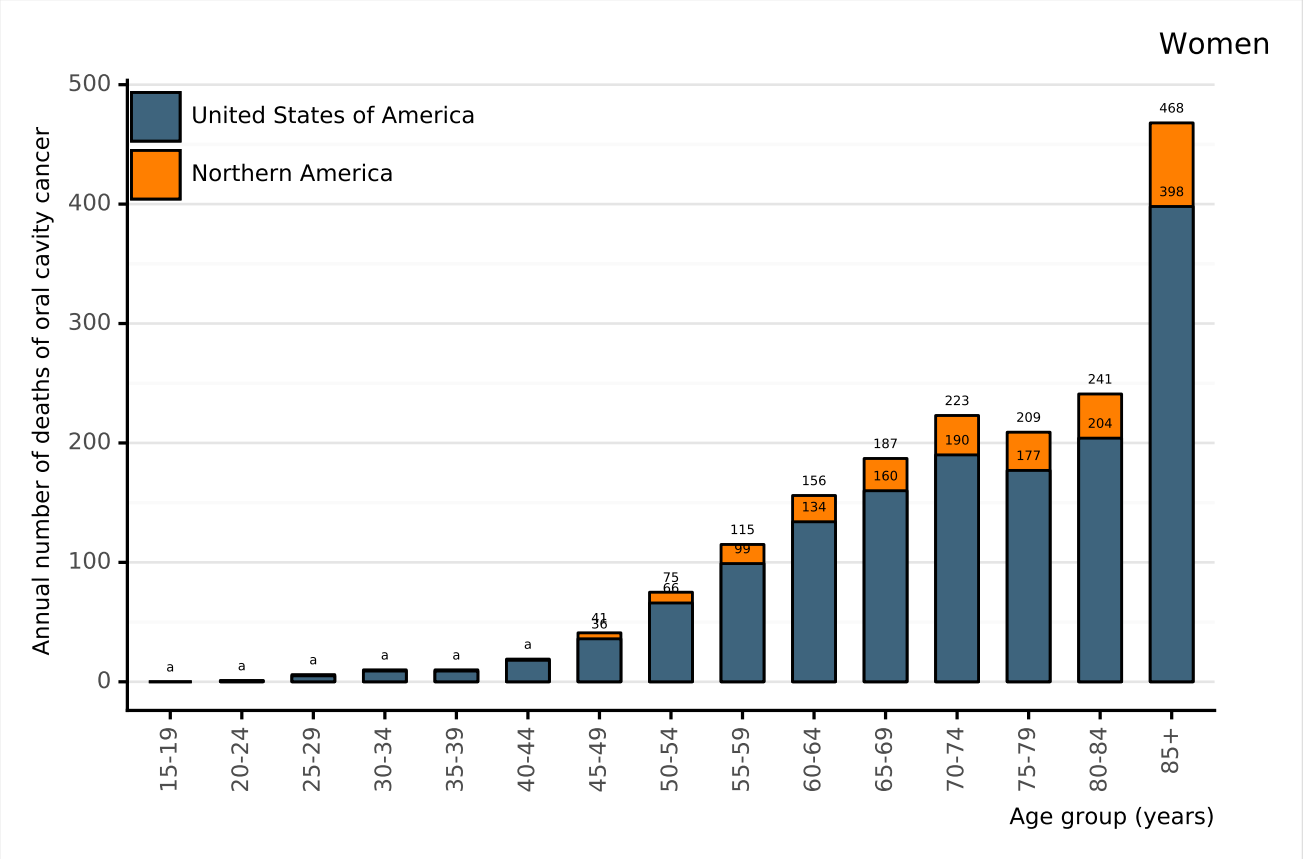
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

[a] 1 cases for United States of America and 1 cases for Northern America in the 15-19 age group. 4 cases for United States of America and 5 cases for Northern America in the 20-24 age group. 9 cases for United States of America and 10 cases for Northern America in the 25-29 age group. 14 cases for United States of America and 16 cases for Northern America in the 30-34 age group. 22 cases for United States of America and 26 cases for Northern America in the 35-39 age group.

Data Sources:

Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 129: Annual number of deaths of oral cavity cancer among women by age group in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021

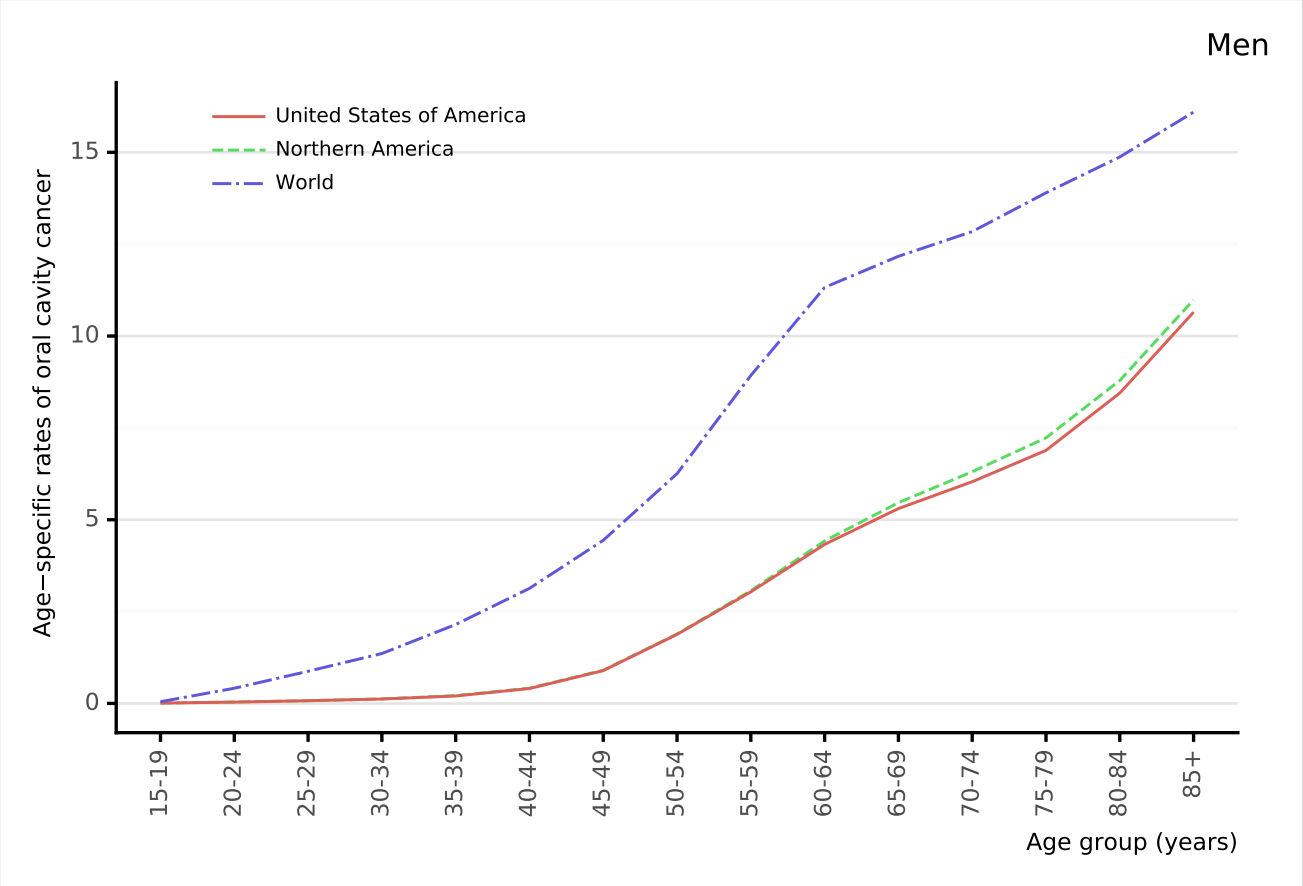
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

[a] 0 cases for United States of America and 0 cases for Northern America in the 15-19 age group. 1 cases for United States of America and 1 cases for Northern America in the 20-24 age group. 5 cases for United States of America and 6 cases for Northern America in the 25-29 age group. 9 cases for United States of America and 10 cases for Northern America in the 30-34 age group. 9 cases for United States of America and 10 cases for Northern America in the 35-39 age group. 18 cases for United States of America and 19 cases for Northern America in the 40-44 age group.

Data Sources:

Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 130: Comparison of age-specific oral cavity cancer mortality rates among men by age in United States of America, within the region, and the rest of world



Data accessed on 27 Jan 2021

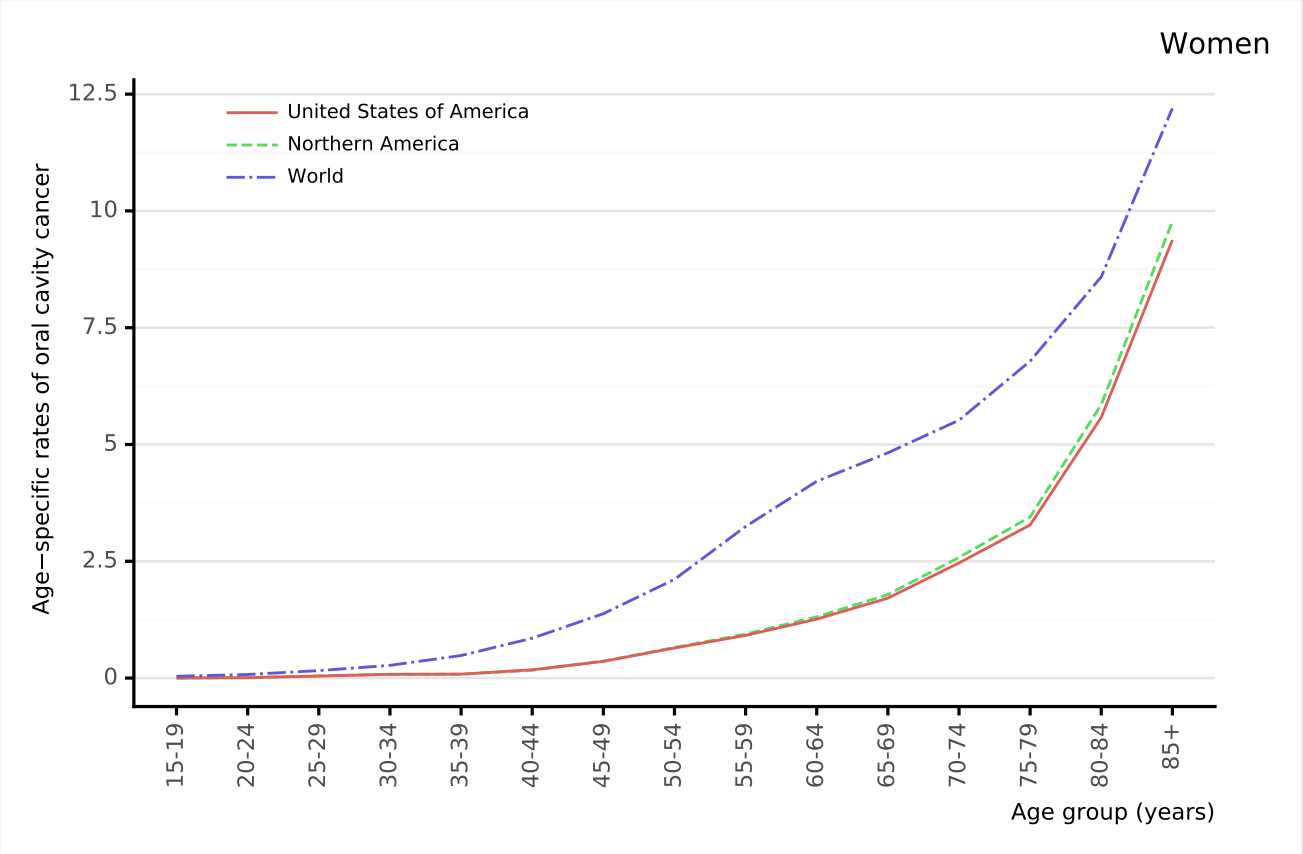
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

[a] Rates per 100,000 men per year.

Data Sources:

Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

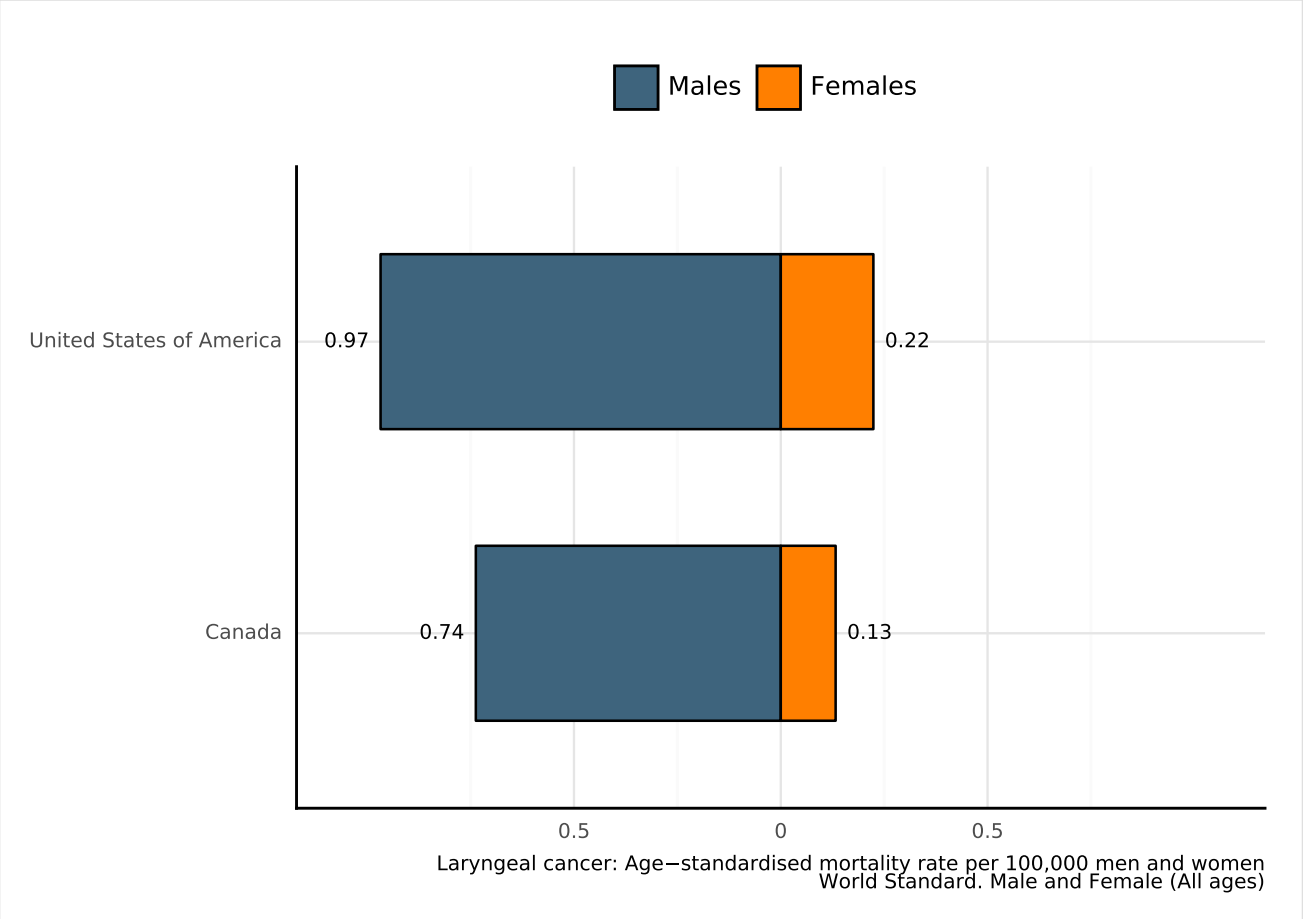
Figure 131: Comparison of age-specific oral cavity cancer mortality rates among women by age in United States of America, within the region, and the rest of world



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Rates per 100,000 women per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

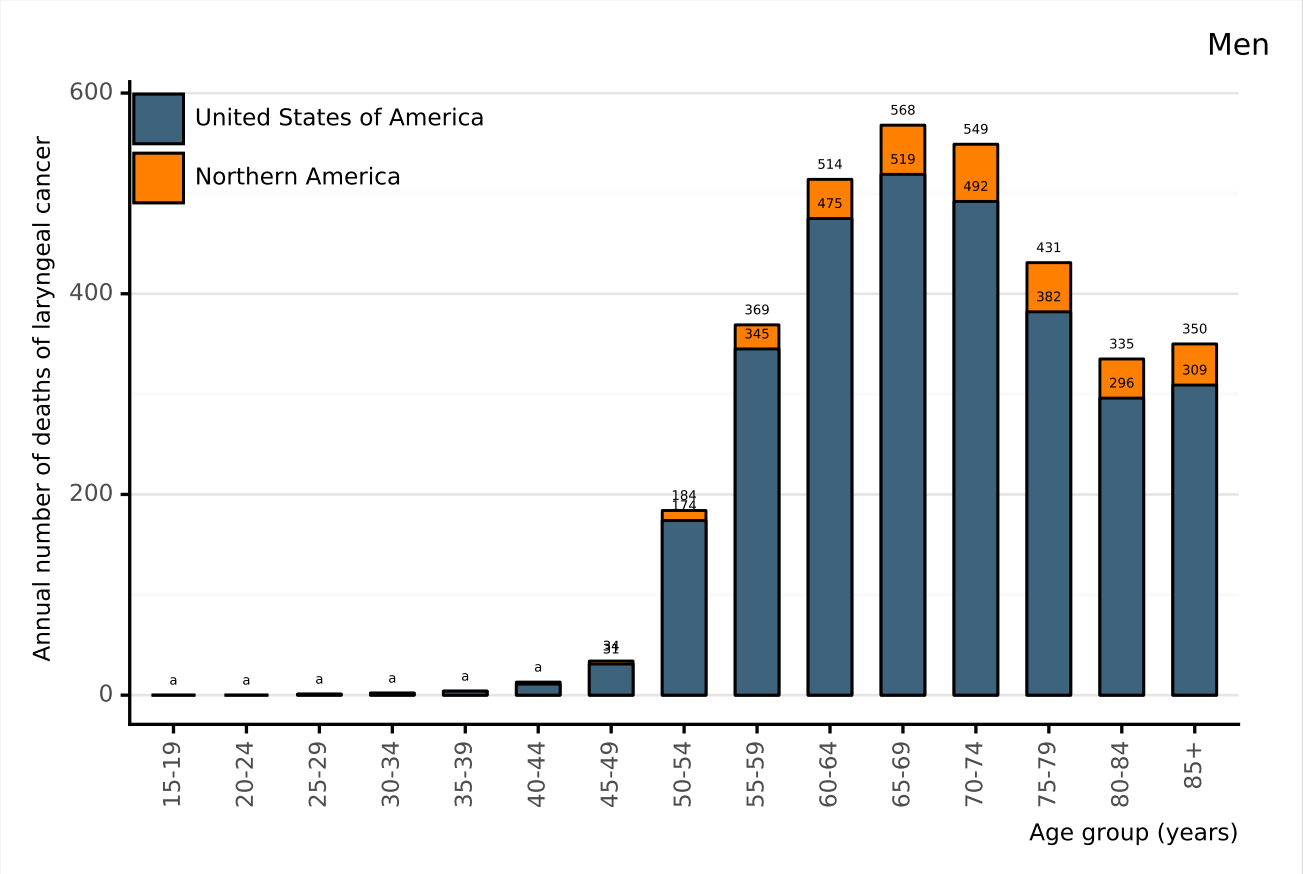
9.2.8 Laryngeal cancer mortality in United States of America across Northern America

Figure 132: Age-standardised mortality rates of laryngeal cancer of United States of America (estimates for 2020)



Data accessed on 27 Jan 2021
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods
[a] Rates per 100,000 men per year.
[b] Rates per 100,000 women per year.
Data Sources:
Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 133: Annual number of deaths of laryngeal cancer among men by age group in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021

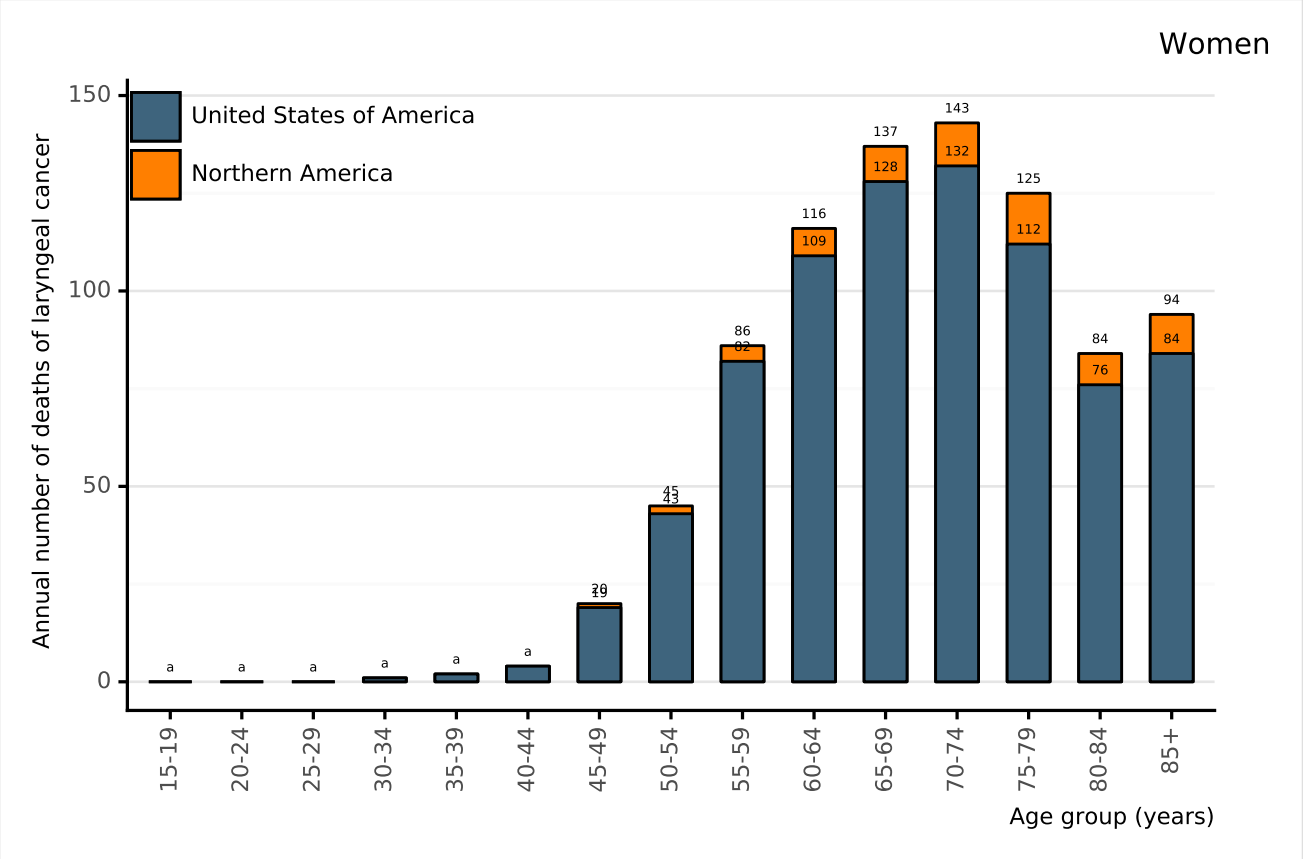
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

[a] 0 cases for United States of America and 0 cases for Northern America in the 15-19 age group. 0 cases for United States of America and 0 cases for Northern America in the 20-24 age group. 1 cases for United States of America and 1 cases for Northern America in the 25-29 age group. 2 cases for United States of America and 2 cases for Northern America in the 30-34 age group. 4 cases for United States of America and 4 cases for Northern America in the 35-39 age group. 11 cases for United States of America and 13 cases for Northern America in the 40-44 age group.

Data Sources:

Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 134: Annual number of deaths of laryngeal cancer among women by age group in United States of America (estimates for 2020)



Data accessed on 27 Jan 2021

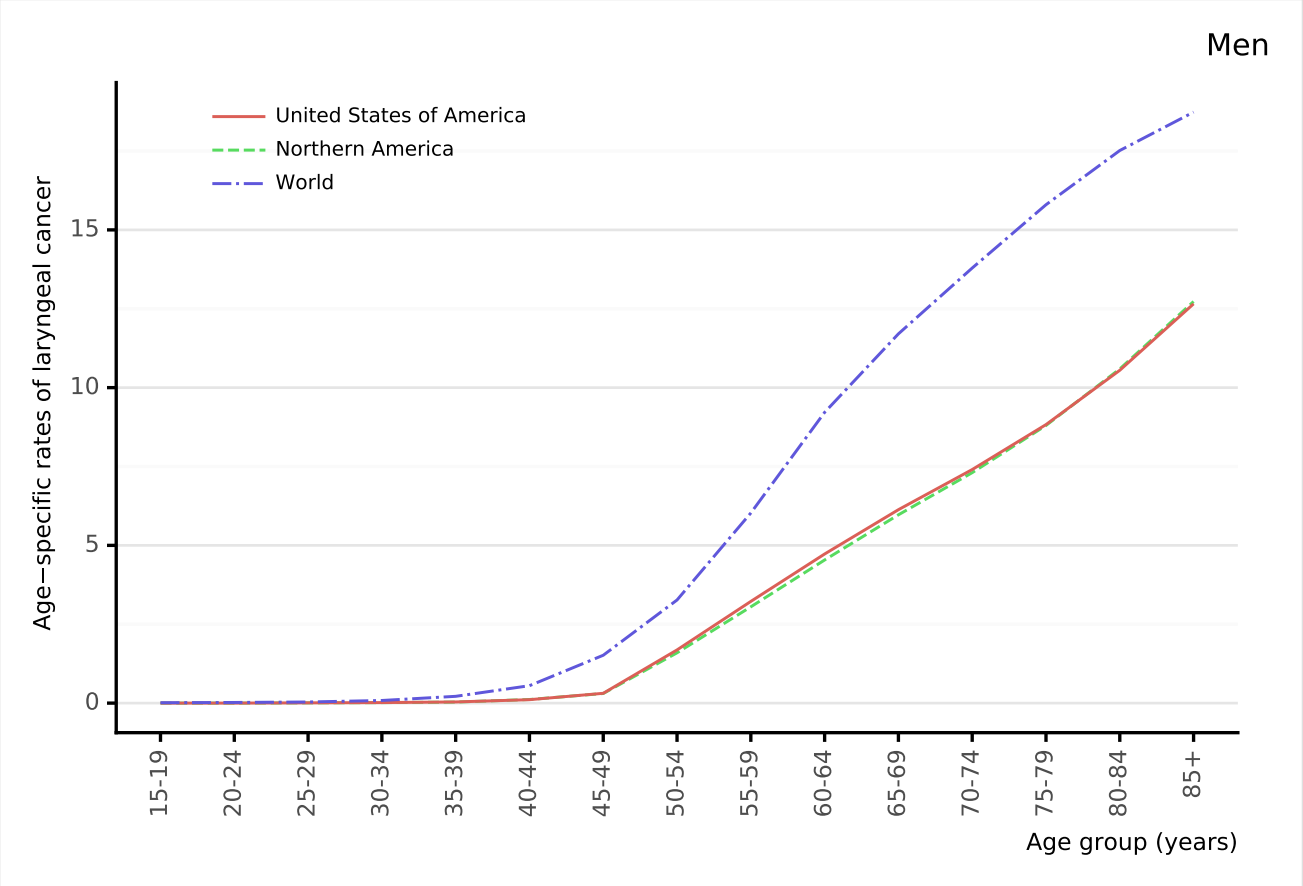
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

[a] 0 cases for United States of America and 0 cases for Northern America in the 15-19 age group. 0 cases for United States of America and 0 cases for Northern America in the 20-24 age group. 0 cases for United States of America and 0 cases for Northern America in the 25-29 age group. 1 cases for United States of America and 1 cases for Northern America in the 30-34 age group. 2 cases for United States of America and 2 cases for Northern America in the 35-39 age group. 4 cases for United States of America and 4 cases for Northern America in the 40-44 age group.

Data Sources:

Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 135: Comparison of age-specific laryngeal cancer mortality rates among men by age in United States of America, within the region, and the rest of world



Data accessed on 27 Jan 2021

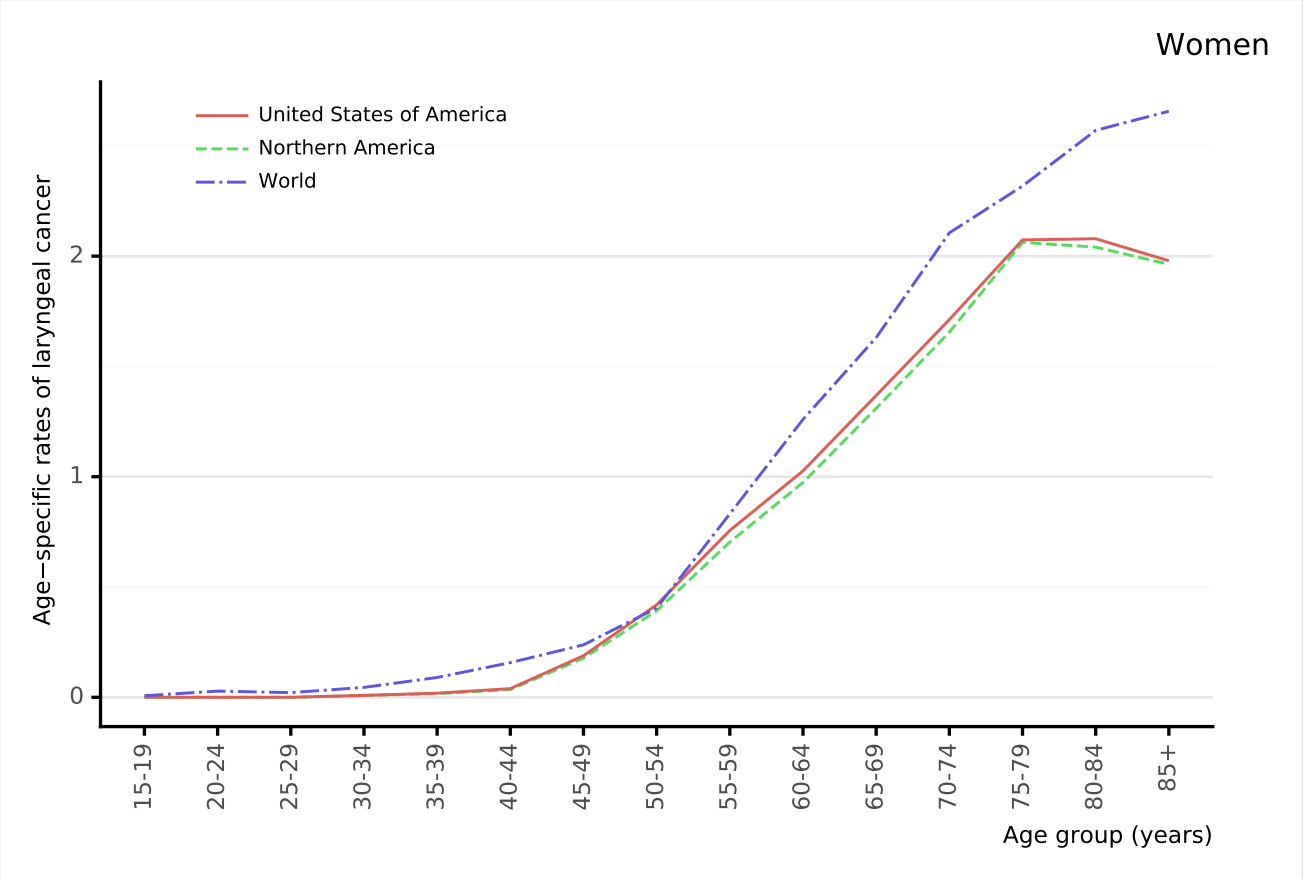
For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

[a] Rates per 100,000 men per year.

Data Sources:

Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

Figure 136: Comparison of age-specific laryngeal cancer mortality rates among women by age in United States of America, within the region, and the rest of world



Data accessed on 27 Jan 2021

For more detailed methods of estimation please refer to http://gco.iarc.fr/today/data-sources-methods

[a] Rates per 100,000 women per year.

Data Sources:

Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, Znaor A, Soerjomataram I, Bray F (2020). Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer. Available from: https://gco.iarc.fr/today, accessed [27 January 2021].

10 Glossary

Table 49: Glossary

Term	Definition
Incidence	Incidence is the number of new cases arising in a given period in a specified population. This information is collected routinely by cancer registries. It can be expressed as an absolute number of cases per year or as a rate per 100,000 persons per year (see Crude rate and ASR below). The rate provides an approximation of the average risk of developing a cancer.
Mortality	Mortality is the number of deaths occurring in a given period in a specified population. It can be expressed as an absolute number of deaths per year or as a rate per 100,000 persons per year.
Prevalence	The prevalence of a particular cancer can be defined as the number of persons in a defined population who have been diagnosed with that type of cancer, and who are still alive at the end of a given year, the survivors. Complete prevalence represents the number of persons alive at certain point in time who previously had a diagnosis of the disease, regardless of how long ago the diagnosis was, or if the patient is still under treatment or is considered cured. Partial prevalence , which limits the number of patients to those diagnosed during a fixed time in the past, is a particularly useful measure of cancer burden. Prevalence of cancers based on cases diagnosed within one, three and five are presented as they are likely to be of relevance to the different stages of cancer therapy, namely, initial treatment (one year), clinical follow-up (three years) and cure (five years). Patients who are still alive five years after diagnosis are usually considered cured since the death rates of such patients are similar to those in the general population. There are exceptions, particularly breast cancer. Prevalence is presented for the adult population only (ages 15 and over), and is available both as numbers and as proportions per 100,000 persons.
Crude rate	Data on incidence or mortality are often presented as rates. For a specific tumour and population, a crude rate is calculated simply by dividing the number of new cancers or cancer deaths observed during a given time period by the corresponding number of person years in the population at risk. For cancer, the result is usually expressed as an annual rate per 100,000 persons at risk.
ASR (age-standardised rate)	An age-standardised rate (ASR) is a summary measure of the rate that a population would have if it had a standard age structure. Standardization is necessary when comparing several populations that differ with respect to age because age has a powerful influence on the risk of cancer. The ASR is a weighted mean of the age-specific rates; the weights are taken from population distribution of the standard population. The most frequently used standard population is the World Standard Population. The calculated incidence or mortality rate is then called age-standardised incidence or mortality rate (world). It is also expressed per 100,000. The world standard population used in GLOBOCAN is as proposed by Segi [1] and modified by Doll and al. [2]. The age-standardised rate is calculated using 10 age-groups. The result may be slightly different from that computed using the same data categorised using the traditional 5 year age bands.

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Term	Definition
Cumulative risk	Cumulative incidence/mortality is the probability or risk of individuals getting/dying from the disease during a specified period. For cancer, it is expressed as the number of new born children (out of 100, or 1000) who would be expected to develop/die from a particular cancer before the age of 75 if they had the rates of cancer observed in the period in the absence of competing causes.
Cytologically normal women	No abnormal cells are observed on the surface of their cervix upon cytology.
Cervical Intraepithelial Neoplasia (CIN) / Squamous Intraepithelial Lesions (SIL)	SIL and CIN are two commonly used terms to describe precancerous lesions or the abnormal growth of squamous cells observed in the cervix. SIL is an abnormal result derived from cervical cytological screening or Pap smear testing. CIN is a histological diagnosis made upon analysis of cervical tissue obtained by biopsy or surgical excision. The condition is graded as CIN 1, 2 or 3, according to the thickness of the abnormal epithelium (1/3, 2/3 or the entire thickness).
Low-grade cervical lesions (LSIL/CIN-1)	Low-grade cervical lesions are defined by early changes in size, shape, and number of ab-normal cells formed on the surface of the cervix and may be referred to as mild dysplasia, LSIL, or CIN-1.
High-grade cervical lesions (HSIL / CIN-2 / CIN-3 / CIS)	High-grade cervical lesions are defined by a large number of precancerous cells on the sur-face of the cervix that are distinctly different from normal cells. They have the potential to become cancerous cells and invade deeper tissues of the cervix. These lesions may be referred to as moderate or severe dysplasia, HSIL, CIN-2, CIN-3 or cervical carcinoma in situ (CIS).
Carcinoma in situ (CIS)	Preinvasive malignancy limited to the epithelium without invasion of the basement membrane. CIN 3 encompasses the squamous carcinoma in situ.
Invasive cervical cancer (ICC) / Cervical cancer	If the high-grade precancerous cells invade the basement membrane is called ICC. ICC stages range from stage I (cancer is in the cervix or uterus only) to stage IV (the cancer has spread to distant organs, such as the liver).
Adenocarcinoma	Invasive tumour with glandular and squamous elements intermingled

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Cancer Epidemiology Research Program, Catalan Institute of Oncology (ICO), Institut d'Investigació Biomèdica de Bellvitge (IDIBELL), in alphabetic order
Albero G, Amarilla S, Bosch FX, Bruni L, Collado JJ, de Sanjosé S, Gómez D, Mena M, Muñoz J, Ruiz FJ, Serrano B.
International Agency for Research on Cancer (IARC)

Note to the reader

Anyone who is aware of relevant published data that may not have been included in the present report is encouraged to contact the HPV Information Centre for potential contributions.
Although efforts have been made by the HPV Information Centre to prepare and include as accurately as possible the data presented, mistakes may occur. Readers are requested to communicate any errors to the HPV Information Centre, so that corrections can be made in future volumes.

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Contact information:
ICO/IARC HPV Information Centre
Institut Català d'Oncologia
Avda. Gran Via de l'Hospitalet, 199-203
08908 L'Hospitalet de Llobregat (Barcelona, Spain)
e-mail: info@hpvcentre.net
internet address: www.hpvcentre.net