Human Papillomavirus and Related Diseases Report

MALAWI

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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 Malawi on cervical cancer, other anogenital cancers and head and neck cancers, HPV-related statistics, factors contributing to cervical cancer, cervical cancer screening practices, HPV vaccine introduction, and other relevant immunization indicators. The report is intended to strengthen the guidance for health policy implementation of primary and secondary cervical cancer prevention strategies in the country.

Malawi has a population of 4.45 million women aged 15 years and older who are at risk of developing cervical cancer. Current estimates indicate that every year 3684 women are diagnosed with cervical cancer and 2314 die from the disease. Cervical cancer in Malawi ranks as the 1^{st} most frequent cancer among women and the 1^{st} most frequent cancer among women between 15 and 44 years of age. Based on Eastern Africa studies performing HPV detection tests in cervical samples, about 20.3% of women in the general population are estimated to harbour cervical HPV-16 infection at a given time, and 68.3% of invasive cervical cancers are attributed to HPVs 16 or 18.

Table 1: Key Statistics on Malawi

Population			
Women at risk for cervical cancer (Female population aged >=15 yrs)			4.76 millions
Burden of cervical cancer and other HPV-related cancers			
Annual number of cervical cancer cases			3,684
Annual number of cervical cancer deaths			2,314
Crude incidence rates per 100,000 population and year ‡:		Male	Female
	Cervical cancer	-	46.5
	Anal cancer	0.1	0.2
	Vulvar cancer	-	0.7
	Vaginal cancer	-	0.7
	Penile cancer	1.4	-
	Pharynx cancer (excluding nasopharynx)	0.1	0.0
Burden of cervical HPV infection			
Prevalence (%) of HPV 16 and/or HPV 18 among women with:			
	Normal cytology		4.7†
	Low-grade cervical lesions (LSIL/CIN-1)		26.5†
	High-grade cervical lesions (HSIL/CIN-2/CIN-3/CIS)		43.9†
	Cervical cancer		68.3†
Other factors contributing to cervical cancer			
Smoking prevalence (%), women			6.4
Total fertility rate (live births per women)			5.7
Oral contraceptive use (%) among women			2.5
HIV prevalence (%), adults (15-49 years)			10.0 [9.3 - 10.8]
Sexual behaviour			
Percentage of 15-year-old who have had sexual intercourse (men/women)			14 / 15
Range of median age at first sexual intercourse (men/women)			19.0-18.0 / 17.8-17.0
Cervical screening practices and recommendations			
Cervical cancer screening coverage, % (age and screening interval, reference)	2.6% (All women aged 25-64 screened every 3y, WHS 2003 Malawi)		
Screening ages (years)			30-50
Screening interval (years) or frequency of screens			3-5 years
HPV vaccine			
HPV vaccine introduction			
	HPV vaccination program		Pilot program
	Date of the HPV vaccination routine immunization programme start		2013
	HPV vaccination target age for routine immunization		9-13
	Full course HPV vaccination coverage for routine immunization: % (calendar year)		-

‡Range of crude incidence rates of the following registries: Blantyre.
† The data is the subregion Eastern Africa

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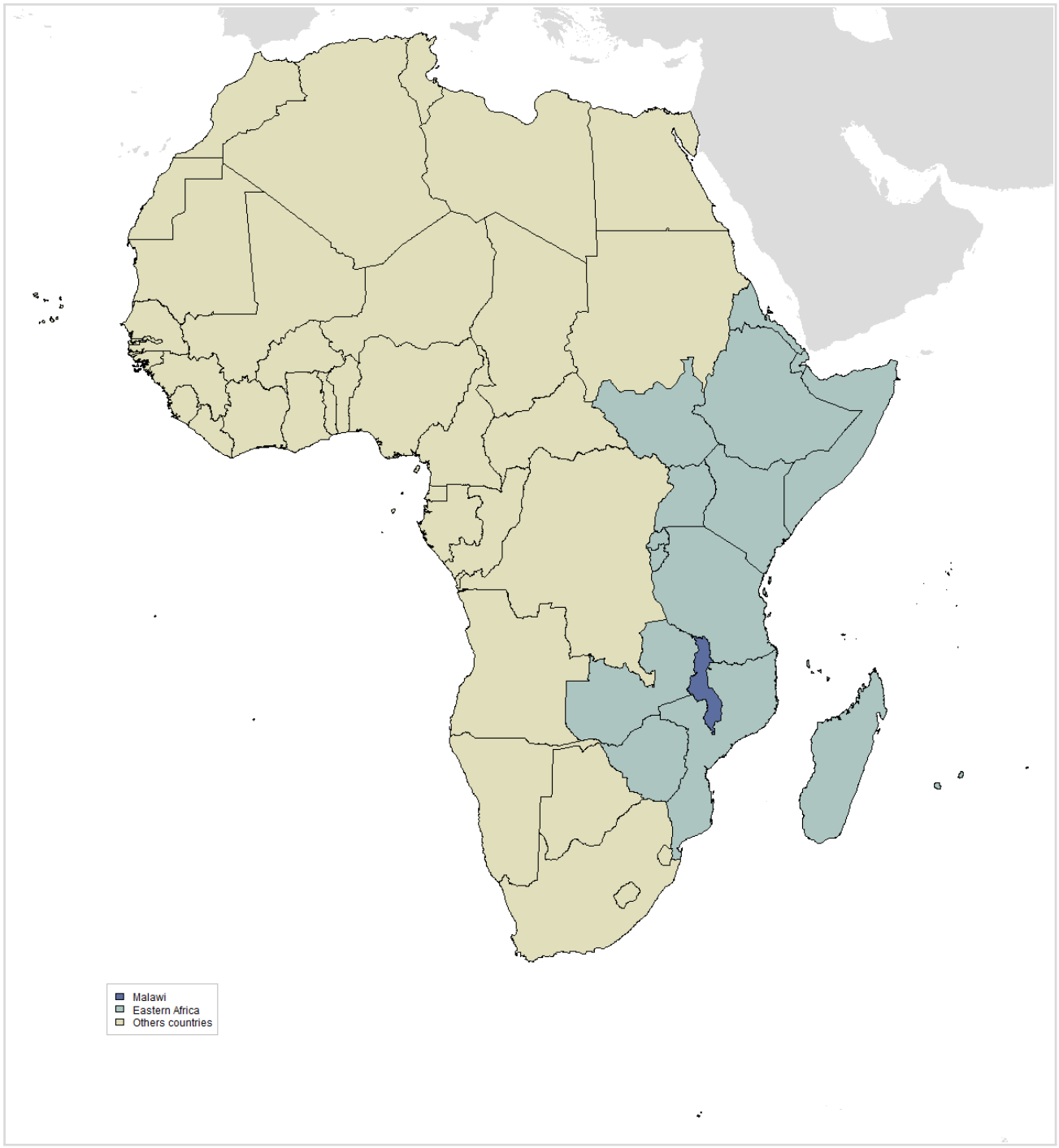
1 Introduction

Figure 1: Malawi in Eastern Africa



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

Section 2, Demographic and socioeconomic factors. This section summarizes the socio-demo-

graphic profile of country. For analytical purposes, Malawi is classified in the geographical region of Eastern Africa (Figure 1, lighter blue), which is composed of the following countries: Burundi, Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Mozambique, Mauritius, Malawi, Mayotte, Reunion, Rwanda, Somalia, South Sudan, Seychelles, Tanzania, Uganda, Zambia, Zimbabwe. Throughout the report, Malawi 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 Malawi and the Eastern Africa region with estimates of prevalence, incidence and mortality rates.

Section 4, HPV related statistics. This section reports on prevalence of HPV and HPV type-specific distribution in Malawi, 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) and men is 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 the use of 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.

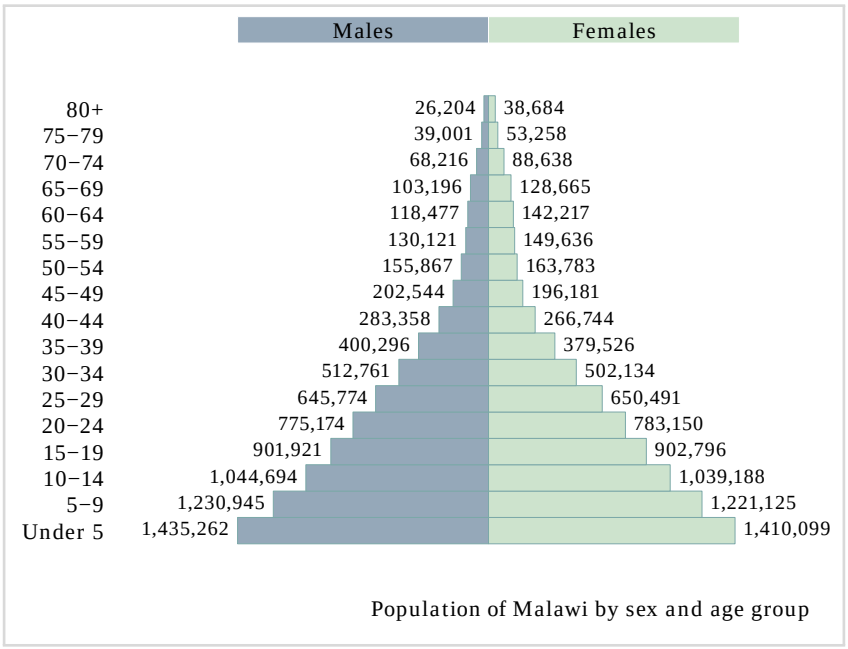
Section 7, HPV preventive strategies. This section presents preventive strategies that include basic characteristics and performance of cervical cancer screening status, status of HPV vaccine licensure introduction, and recommendations in national immunization programs.

Section 8, Protective factors for cervical cancer. This section presents the prevalence of male circumcision and condom use that have shown a protective effect against HPV transmission..

Section 9, Indicators related to immunization practices other than HPV vaccines. This section presents data on immunization coverage and practices for selected vaccines. This information will be relevant for assessing the country's capacity to introduce and implement the new HPV vaccines. The data are periodically updated and posted on the WHO immunization surveillance, assessment and monitoring website. (http://www.who.int/immunization_monitoring/en/).

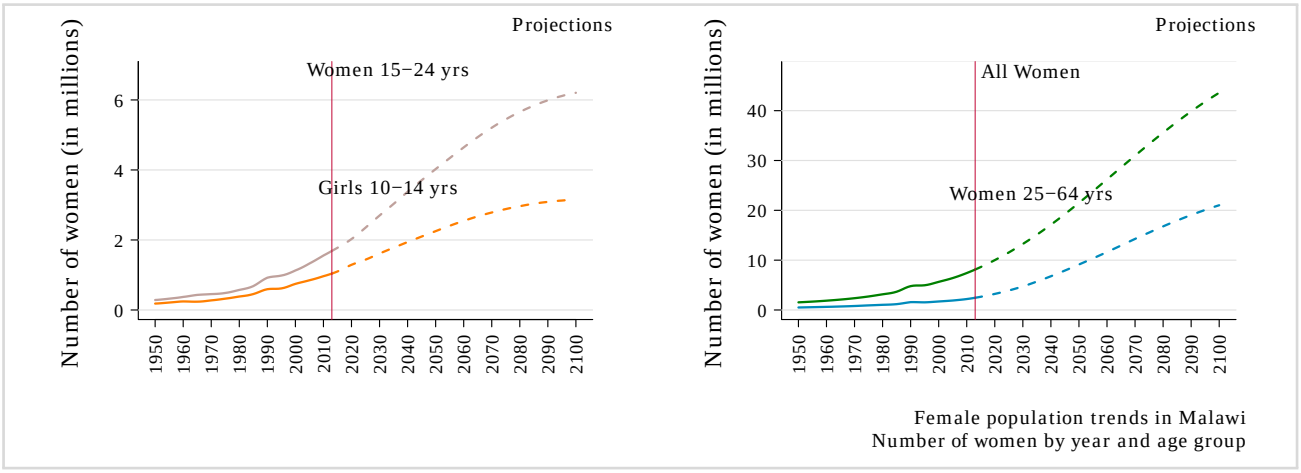
2 Demographic and socioeconomic factors

Figure 2: Population pyramid of Malawi 2015



Data accessed at 26 ago. 2015.
Estimated population in a country, area or region as of 1 July of the year indicated.
Data sources:
United Nations, Department of Economic and Social Affairs, Population Division (2015). World Population Prospects: The 2015 Revision. Available at: http://esa.un.org/unpd/wpp/ [Accessed: August 2015]

Figure 3: Population trends of four selected age groups in Malawi



Data accessed at 26 ago. 2015.
Estimated population in a country, area or region as of 1 July of the year indicated.
Data sources:
United Nations, Department of Economic and Social Affairs, Population Division (2015). World Population Prospects: The 2015 Revision. Available at: http://esa.un.org/unpd/wpp/ [Accessed: August 2015]

Table 2: Sociodemographic indicators in Malawi

Indicator	Male	Female	Total
Population in 1,000s[1,a]	8,073.8	8,116.3	16,190.1
Population growth rate (%)[a,±]	-	-	3
Median age of the population (years)[a,∓]	-	-	16.9
Population living in urban areas (%)[2,a,∓]	-	-	15.5
Crude birth rate (births per 1,000 population)[a,±]	-	-	41.8
Crude death rate (deaths per 1,000 population)[a,±]	-	-	13.5
Life expectancy at birth (years)[3,*]	58.1	61.1	59.6
Adult mortality rate (probability of dying between 15 and 60 years per 1,000 population)[3,*]	325.7	290.0	59.6
Under-five mortality rate (per 1,000 live births)[3,*]	-	67.9	59.6
Density of physicians (per 10,000 population)[4,b,c,⋆]	-	-	0.2
Gross national income per capita (PPP int $)[5,°]	-	-	780
Adult (15 years and over) literacy rate (%)[6,•]	73.0	58.6	65.8
Youth (15-24 years) literacy rate (%)[6,•]	74.9	75.2	75.1
Net primary school enrollment ratio[6]	89.6[△]	96.0[△]	96.9[⋆]
Net secondary school enrollment ratio[6,*]	31.9	30.5	31.2

Data accessed between 09 jul. 2013 to 26 ago. 2015.

[a] Estimated population in a country, area or region as of 1 July of the year indicated.

[b] Density (per 10,000 population) and number of physicians.

[c] Includes generalist medical practitioners and specialist medical practitioners.

Year of estimation: [±] 2005-2010; [∓] 2010; [*] 2013; [⋆] 2009; [°] 2014; [•] 2015; [△] 2007;

[a] For methods of estimation, please refer to original source.

Data sources:

[1] United Nations, Department of Economic and Social Affairs, Population Division (2015). World Population Prospects: The 2015 Revision. Available at: http://esa.un.org/unpd/wpp/ [Accessed: August 2015]

[2] United Nations, Department of Economic and Social Affairs, Population Division (2012). World Urbanization Prospects : The 2011 Revision. CD-ROM Edition - Data in digital form (POP/DB/WUP/Rev.2011).

[3] World Health Statistics 2015. Geneva, World Health Organization, 2013. Available at: http://www.who.int/gho/publications/world_health_statistics/2015/en/ [Accessed on July 2015].

[4] WHO Global Health Workforce Statistics [online database]. Geneva, World Health Organization, 2014. Available at: http://www.who.int/hrh/statistics/hwfstats/[Accessed on July 2015]

[5] World Development Indicators Database, 2015. Washington, DC, World Bank. Available at: http://databank.worldbank.org/data/reports.aspx?source=world-development-indicators [Accessed on July 2015]

[6] UNESCO Institute for Statistics Data Centre [online database]. Montreal, UNESCO Institute for Statistics, 2015. Available at: http://stats.uis.unesco.org [Accessed on July 2015]

3 Burden of HPV related cancers

3.1 Cervical cancer

Cancer of the cervix uteri is the 4th most common cancer among women worldwide, with an estimated 527,624 new cases and 265,672 deaths in 2012. Worldwide, mortality rates of cervical cancer are substantially lower than incidence with a ratio of mortality to incidence to 50.3% (GLOBOCAN 2012). 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 Malawi and in comparison to geographic region, including estimates of the annual number of new cases , deaths, and incidence and mortality rates.

3.1.1 Cervical cancer incidence in Malawi

KEY STATS.

About **3,684 new cervical cancer cases** are diagnosed **annually** in **Malawi** (estimations for 2012).

Cervical cancer **ranks as the 1^{st} cause** of female cancer in **Malawi**.

Cervical cancer is the **1^{th} most common** female cancer in **women aged 15 to 44 years in Malawi**.

Table 3: Cervical cancer incidence in Malawi (estimations for 2012)

Indicator	Malawi	Eastern Africa	World
Annual number of new cancer cases	3,684	45,707	527,624
Crude incidence rate[a]	46.5	25.8	15.1
Age-standardized incidence rate[a]	75.9	42.7	14.0
Cumulative risk (%) at 75 years old[b]	7.4	4.6	1.4

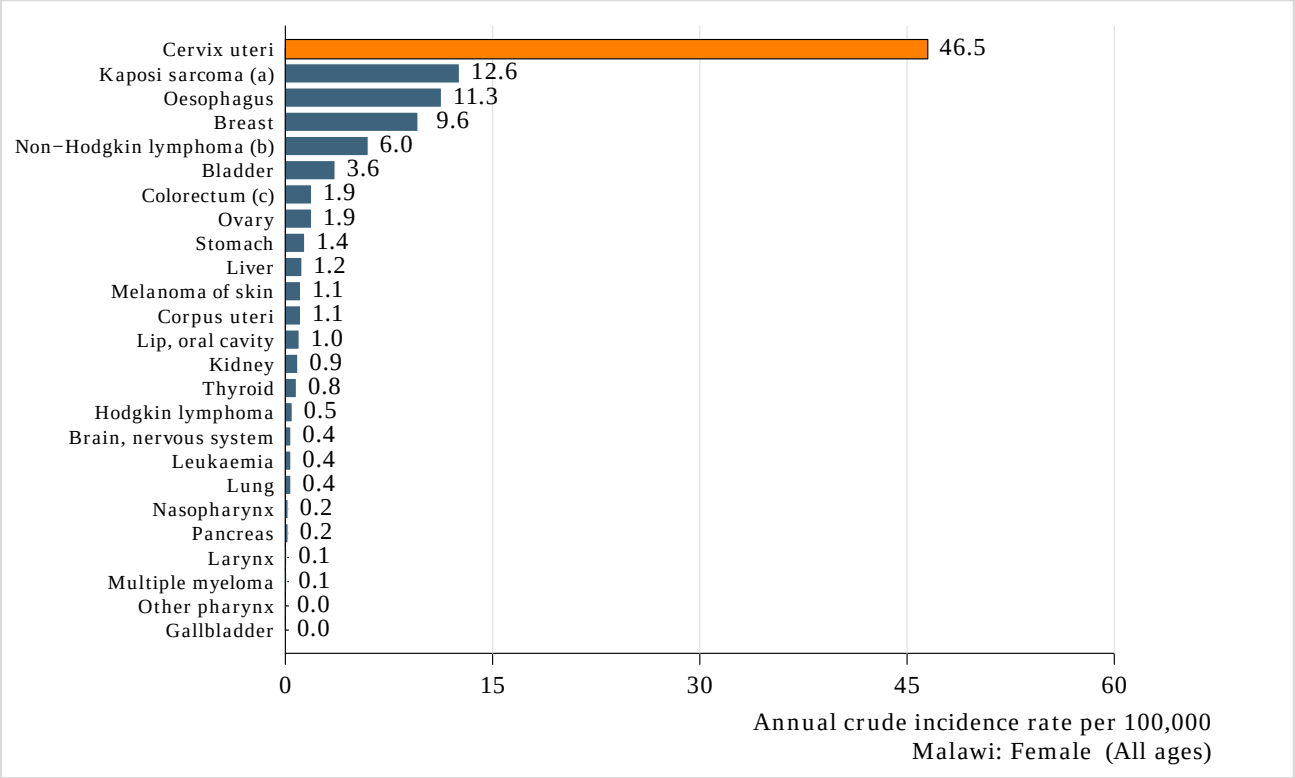
Data accessed at 15 nov. 2015.
Incidence data is available from high quality regional (coverage lower than 10%). Data is included in Cancer incidence in Five Continents (CI5) volume IX and/or X. Incidence rates were estimated using one cancer registry covering part of a country as representative of the country profile. For more detailed methods of estimation please refer to http://globocan.iarc.fr/old/method/method.asp?country=454
[a] Rates per 100,000 women per year.
[b] 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.
Data sources:
Ferlay J, Soerjomataram I, Ervik M, Dikshit R, Eser S, Mathers C, Rebelo M, Parkin DM, Forman D, Bray F. GLOBOCAN 2012 v1.2, Cancer Incidence and Mortality Worldwide: IARC CancerBase No. 11 [Internet]. Lyon, France: International Agency for Research on Cancer; 2013. Available from: http://globocan.iarc.fr.

Table 4: Cervical cancer incidence by cancer registry in Malawi (observed cases during the specified period)

Cancer registry[1]	Period	N cases[a]	Crude rate[b]	ASR[b]
Blantyre	2003-2007	904	38.7	76.3

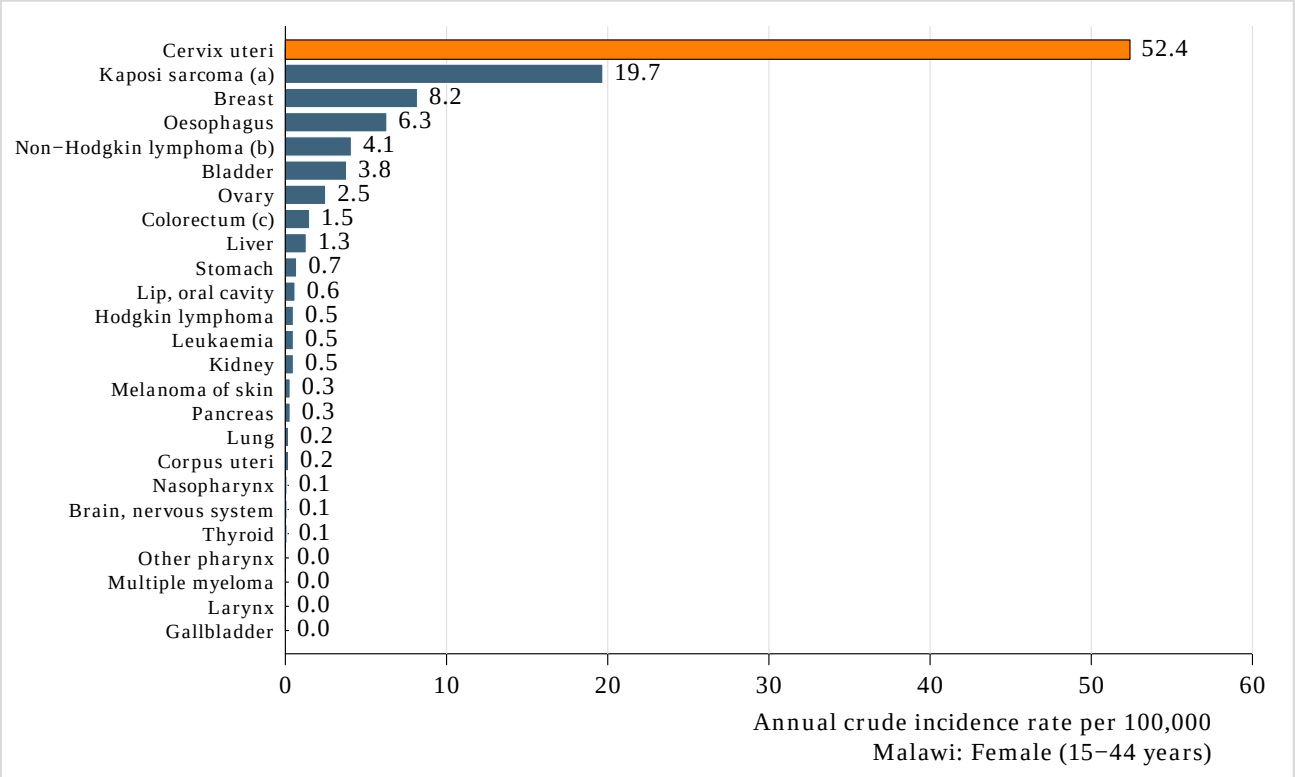
Data accessed at 05 may. 2015.
ASR: Age-standardized rate, Standardized rates have been estimated using the direct method and the World population as the reference;
Please refer to original source (available at http://ci5.iarc.fr/CI5i-ix/ci5i-ix.htm)
[a] Accumulated number of cases during the period 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

Figure 4: Incidence of cervical cancer compared to other cancers in women of all ages in Malawi (estimations for 2012)



Data accessed at 15 nov. 2015.
[a] Includes B21.0 (HIV disease resulting in Kaposi sarcoma).
[b] Includes HIV disease resulting in malignant neoplasms (B21).
[c] Includes anal cancer (C21).
Data sources:
Ferlay J, Soerjomataram I, Ervik M, Dikshit R, Eser S, Mathers C, Rebelo M, Parkin DM, Forman D, Bray F. GLOBOCAN 2012 v1.2, Cancer Incidence and Mortality Worldwide: IARC CancerBase No. 11 [Internet]. Lyon, France: International Agency for Research on Cancer; 2013. Available from: http://globocan.iarc.fr.

Figure 5: Age-specific cervical cancer incidence compared to age-specific incidence of other cancers among women 15-44 years of age in Malawi (estimations for 2012)



Data accessed at 15 nov. 2015.

[a] Includes B21.0 (HIV disease resulting in Kaposi sarcoma).

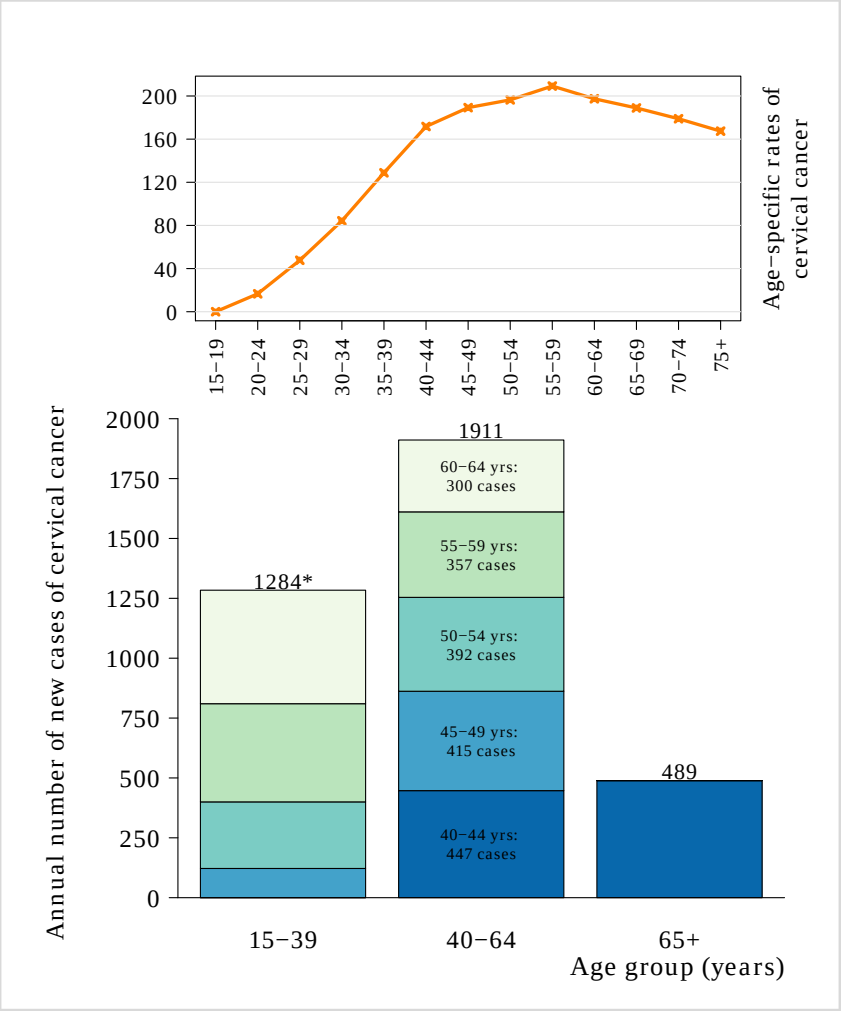
[b] Includes HIV disease resulting in malignant neoplasms (B21).

[c] Includes anal cancer (C21).

Data sources:

Ferlay J, Soerjomataram I, Ervik M, Dikshit R, Eser S, Mathers C, Rebelo M, Parkin DM, Forman D, Bray F. GLOBOCAN 2012 v1.2, Cancer Incidence and Mortality Worldwide: IARC CancerBase No. 11 [Internet]. Lyon, France: International Agency for Research on Cancer; 2013. Available from: http://globocan.iarc.fr.

Figure 6: Annual number of cases and age-specific incidence rates of cervical cancer in Malawi (estimations for 2012)



*15-19 yrs: 0 cases. 20-24 yrs: 122 cases. 25-29 yrs: 278 cases. 30-34 yrs: 410 cases. 35-39 yrs: 474 cases.

Data accessed at 15 nov. 2015.

Rates per 100,000 women per year.

Data sources:

Ferlay J, Soerjomataram I, Ervik M, Dikshit R, Eser S, Mathers C, Rebelo M, Parkin DM, Forman D, Bray F. GLOBOCAN 2012 v1.2, Cancer Incidence and Mortality Worldwide: IARC CancerBase No. 11 [Internet]. Lyon, France: International Agency for Research on Cancer; 2013. Available from: http://globocan.iarc.fr.

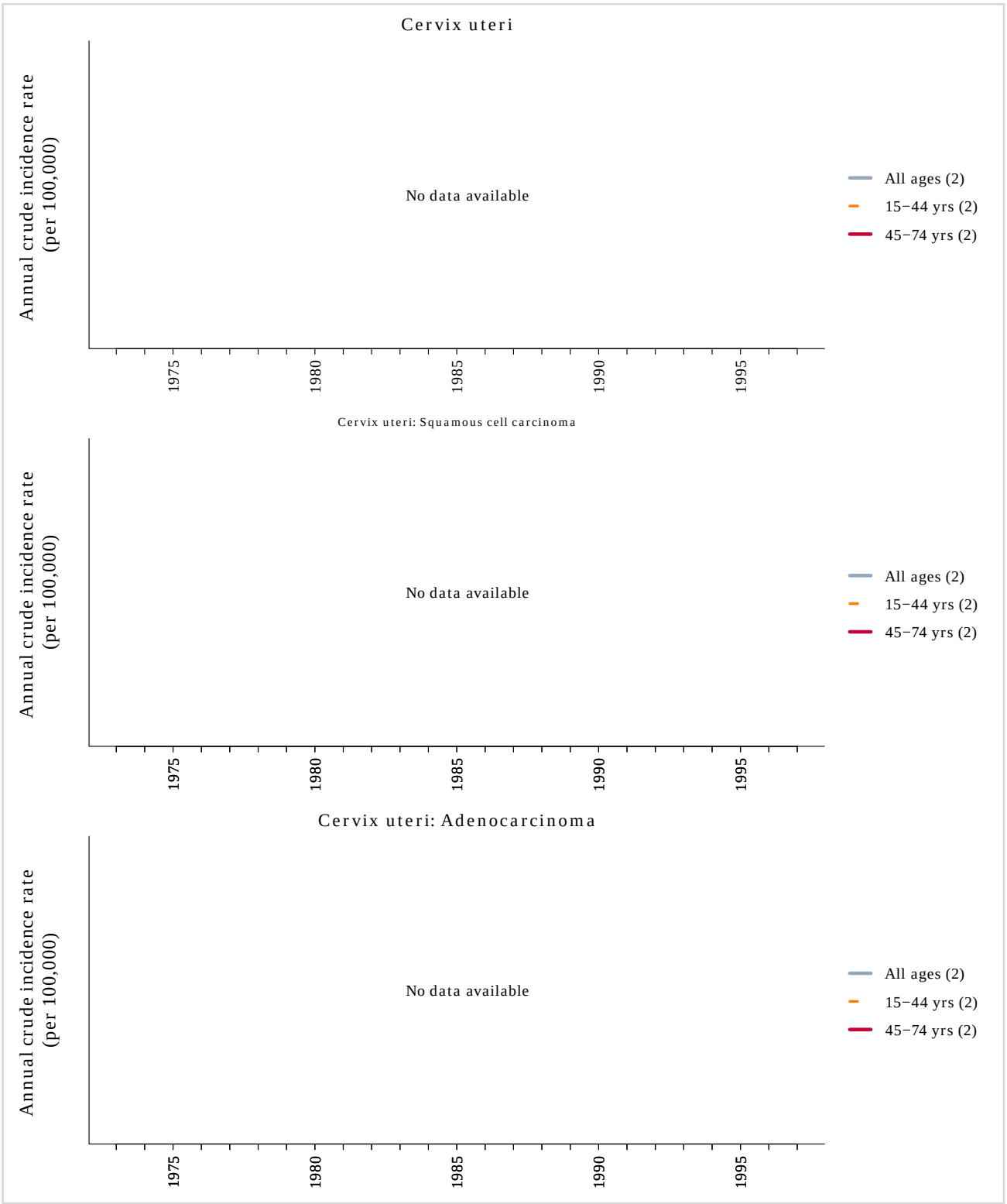
3.1.2 Cervical cancer incidence by histology in Malawi

Table 5: Age-standarized incidence rates of cervical cancer by histological type and cancer registry in Malawi

Cancer registry[a]	Period	Carcinoma			
		Squamous	Adeno	Other	Unspec.
Blantyre	2003-2007	31.5	1.2	-	0.8

Data accessed at 24 jul. 2015.
Adeno: adenocarcinoma; Other: Other carcinoma; Squamous: Squamous cell carcinoma; Unspec: Unspecified carcinoma;
Standarized rates have been estimated using the direct method and the World population as the references. Rates per 100,000 women per year.
Rates per 100,000 women per year. Standarized rates have been estimated using the direct method and the World population as the references.
[a] Care should be taken in interpreting the estimates. Some limitations were present in determining the number of cases or the population at risk that could affect the ability to make direct comparisons with other registry datasets.
Data sources:
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

Figure 7: Time trends in cervical cancer incidence in Malawi (observed cases in the cancer registries)



Data accessed between 22 jul. 2014 to 27 abr. 2015.

[a] Estimated annual percentage change based on the trend variable from the net drift for the most recent two 5-year periods.

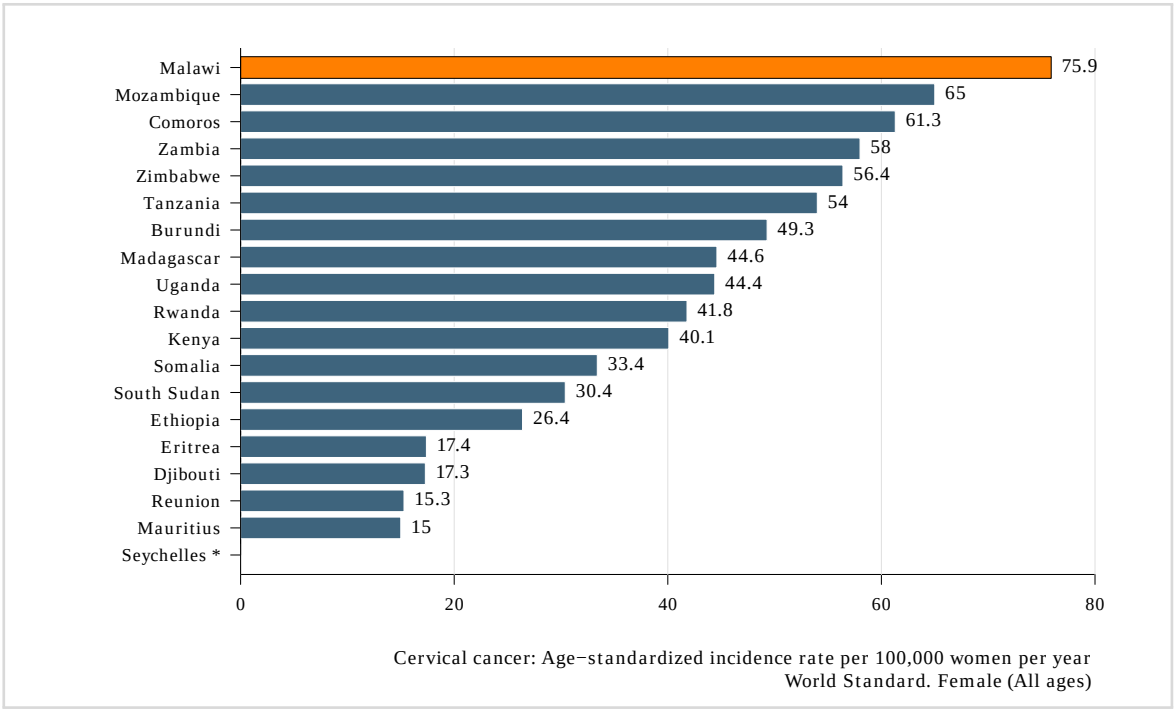
Data sources:

[1] 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.

[2] Ferlay J, Bray F, Steliarova-Foucher E and Forman D. Cancer Incidence in Five Continents, CI5plus: IARC CancerBase No. 9 [Internet]. Lyon, France: International Agency for Research on Cancer; 2014. Available from: http://ci5.iarc.fr

3.1.3 Cervical cancer incidence in Malawi across Eastern Africa

Figure 8: Age-standardized incidence rates of cervical cancer of Malawi (estimations for 2012)



* No rates are available.

Data accessed at 15 nov. 2015.

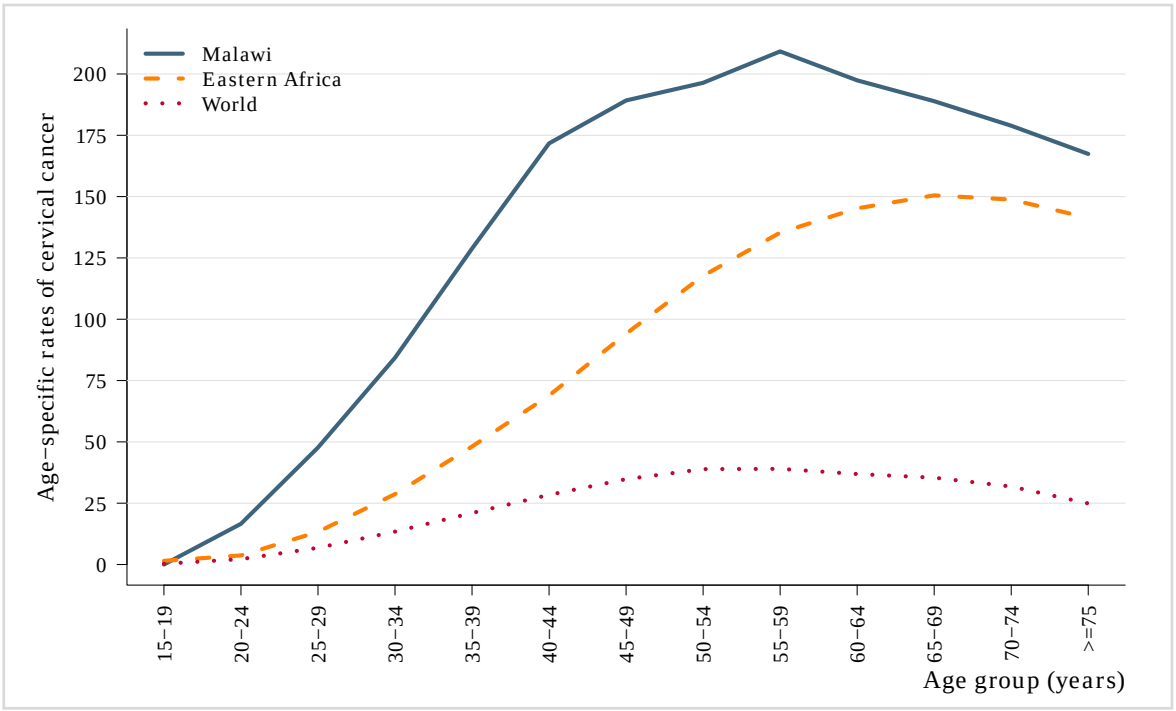
Rates per 100,000 women per year.

[a] Estimate for Sudan and South Sudan

Data sources:

Ferlay J, Soerjomataram I, Ervik M, Dikshit R, Eser S, Mathers C, Rebelo M, Parkin DM, Forman D, Bray F. GLOBOCAN 2012 v1.2, Cancer Incidence and Mortality Worldwide: IARC CancerBase No. 11 [Internet]. Lyon, France: International Agency for Research on Cancer; 2013. Available from: http://globocan.iarc.fr.

Figure 9: Age-specific incidence rates of cervical cancer in Malawi compared to its region and the world



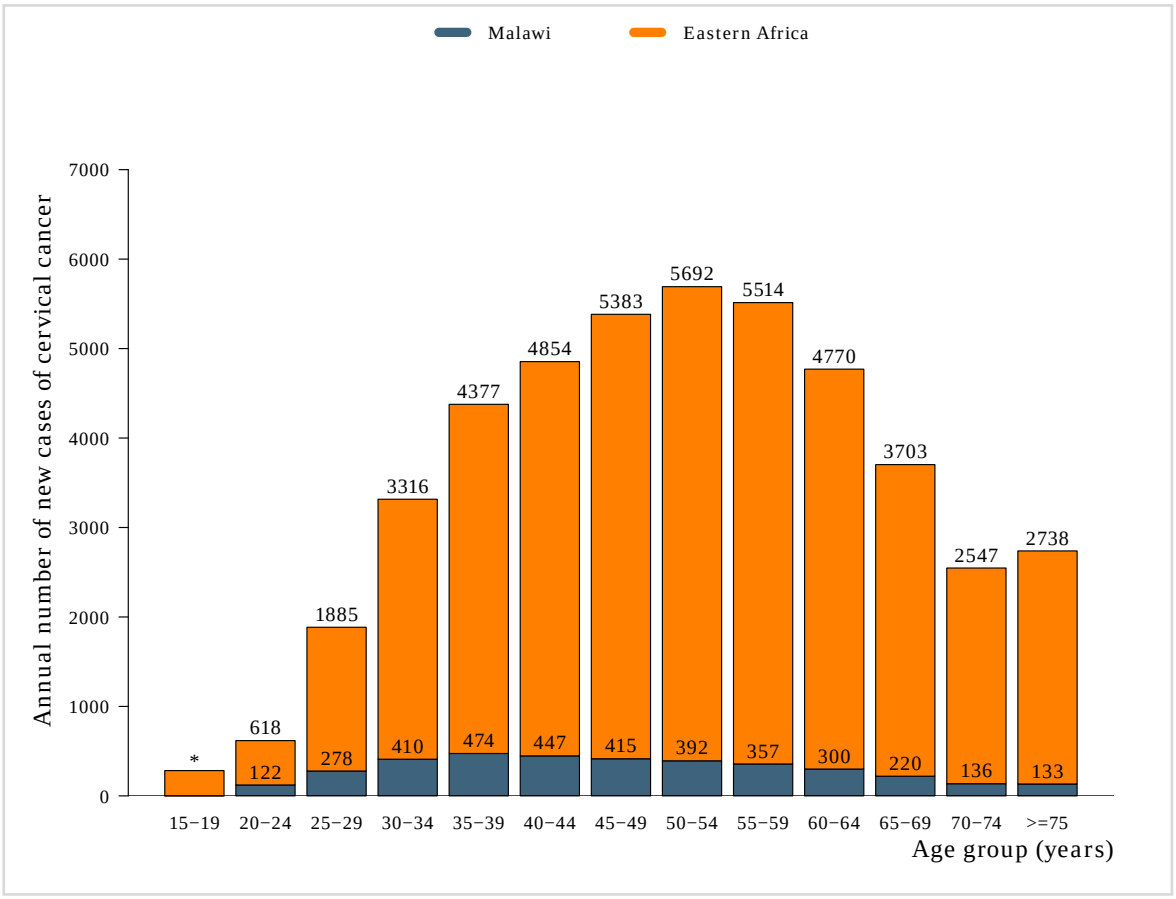
Data accessed at 15 nov. 2015.

Rates per 100,000 women per year.

Data sources:

Ferlay J, Soerjomataram I, Ervik M, Dikshit R, Eser S, Mathers C, Rebelo M, Parkin DM, Forman D, Bray F. GLOBOCAN 2012 v1.2, Cancer Incidence and Mortality Worldwide: IARC CancerBase No. 11 [Internet]. Lyon, France: International Agency for Research on Cancer; 2013. Available from: http://globocan.iarc.fr.

Figure 10: Annual number of new cases of cervical cancer by age group in Malawi (estimations for 2012)



*0 cases for Malawi and 283 cases for Eastern Africa in the 15-19 age group.

Data accessed at 15 nov. 2015.

Data sources:

Ferlay J, Soerjomataram I, Ervik M, Dikshit R, Eser S, Mathers C, Rebelo M, Parkin DM, Forman D, Bray F. GLOBOCAN 2012 v1.2, Cancer Incidence and Mortality Worldwide: IARC CancerBase No. 11 [Internet]. Lyon, France: International Agency for Research on Cancer; 2013. Available from: http://globocan.iarc.fr.

3.1.4 Cervical cancer mortality in Malawi

KEY STATS.

About **2,314 cervical cancer deaths occur annually in Malawi** (estimations for 2012).

Cervical cancer **ranks as the 1st cause** of female cancer deaths in **Malawi**.

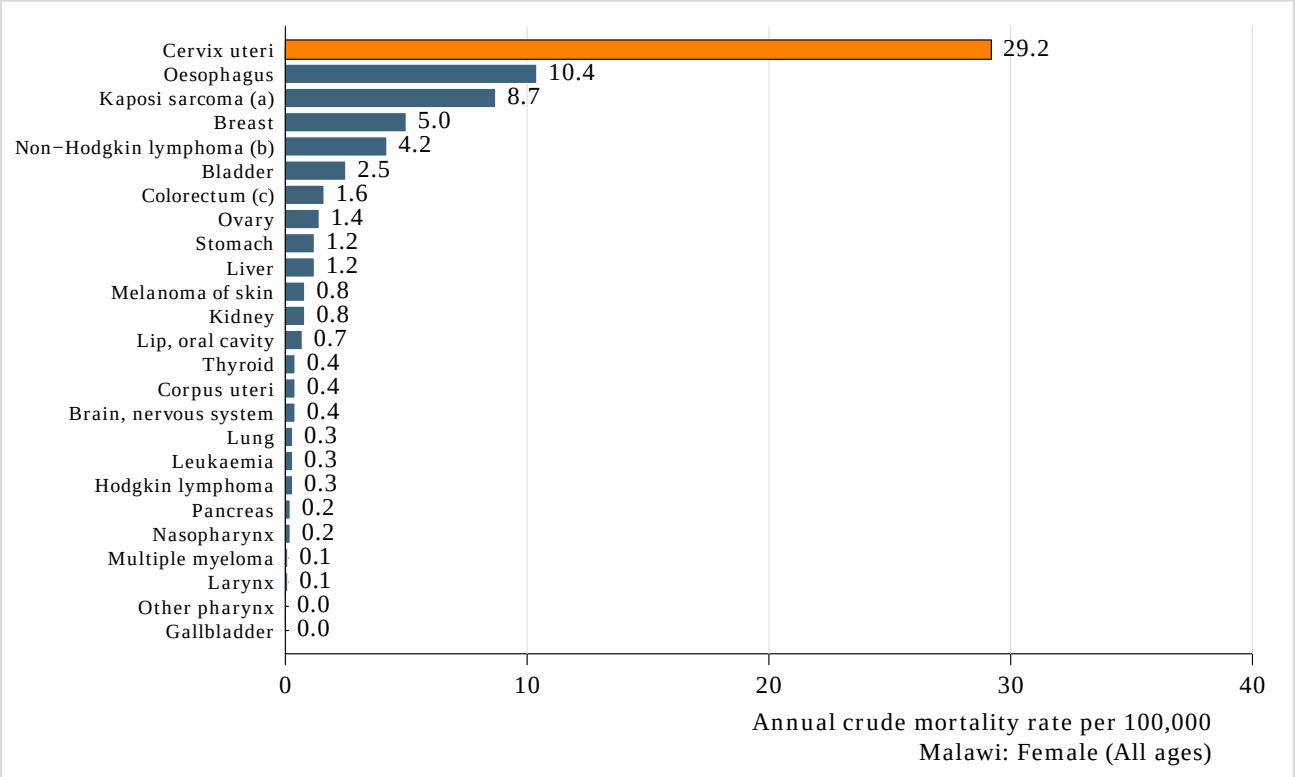
Cervical cancer is the **1st leading cause of cancer deaths** in **women aged 15 to 44 years in Malawi**.

Table 6: Cervical cancer mortality in Malawi (estimations for 2012)

Indicator	Malawi	Eastern Africa	World
Annual number of deaths	2,314	28,197	265,672
Crude mortality rate[a]	29.2	15.9	7.6
Age-standardized mortality rate[a]	49.8	27.6	6.8
Cumulative risk (%) at 75 years old[b]	5.2	3.1	0.8

Data accessed at 15 nov. 2015.
No country-specific mortality data available. Mortality rates were estimated from national incidence estimates using modelled survival. For more detailed methods of estimation please refer to http://globocan.iarc.fr/old/method/method.asp?country=454
[a] Rates per 100,000 women per year.
[b] 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.
Data sources:
Ferlay J, Soerjomataram I, Ervik M, Dikshit R, Eser S, Mathers C, Rebelo M, Parkin DM, Forman D, Bray F. GLOBOCAN 2012 v1.2, Cancer Incidence and Mortality Worldwide: IARC CancerBase No. 11 [Internet]. Lyon, France: International Agency for Research on Cancer; 2013. Available from: http://globocan.iarc.fr.

Figure 11: Cervical cancer mortality compared to other cancers in women of all ages in Malawi (estimations for 2012)



Data accessed at 15 nov. 2015.

[a] Includes B21.0 (HIV disease resulting in Kaposi sarcoma).

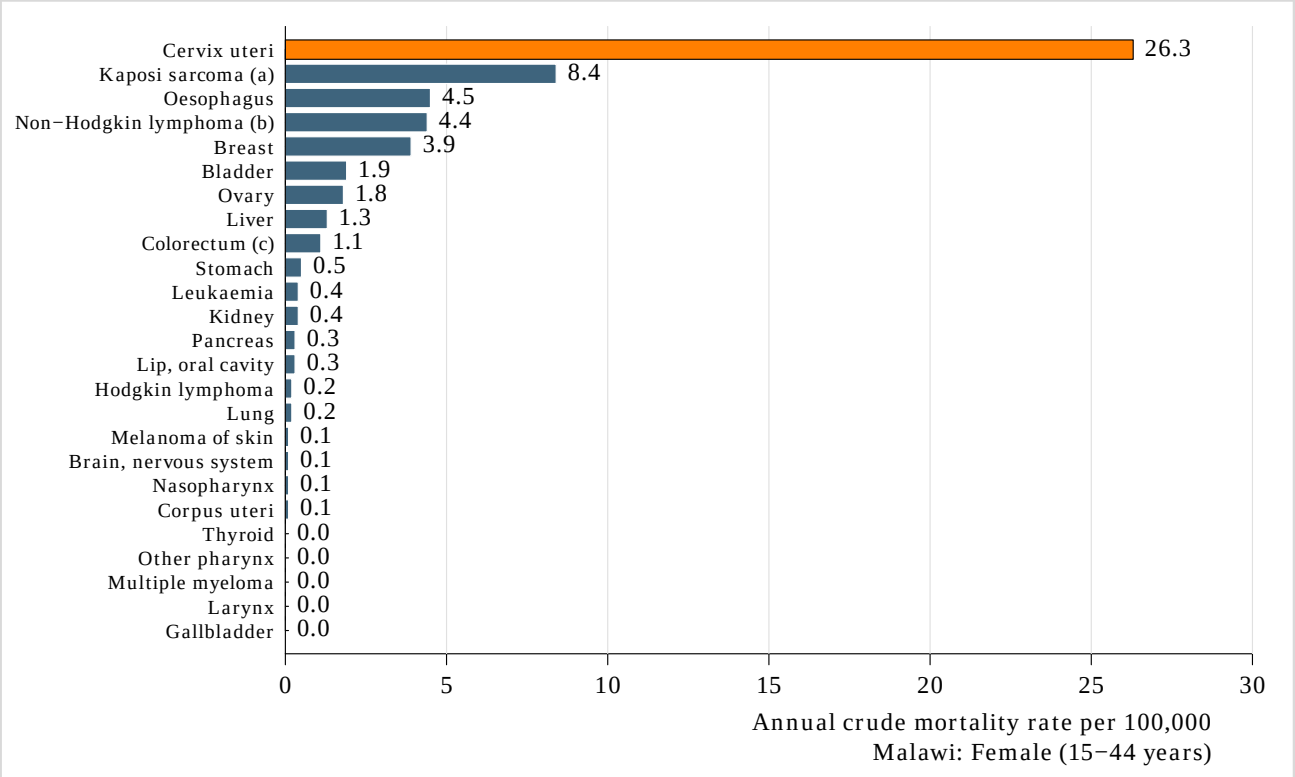
[b] Includes HIV disease resulting in malignant neoplasms (B21).

[c] Includes anal cancer (C21).

Data sources:

Ferlay J, Soerjomataram I, Ervik M, Dikshit R, Eser S, Mathers C, Rebelo M, Parkin DM, Forman D, Bray F. GLOBOCAN 2012 v1.2, Cancer Incidence and Mortality Worldwide: IARC CancerBase No. 11 [Internet]. Lyon, France: International Agency for Research on Cancer; 2013. Available from: http://globocan.iarc.fr.

Figure 12: Age-specific mortality rates of cervical cancer compared to other cancers among women 15-44 years of age in Malawi (estimations for 2012)



Data accessed at 15 nov. 2015.

[a] Includes B21.0 (HIV disease resulting in Kaposi sarcoma).

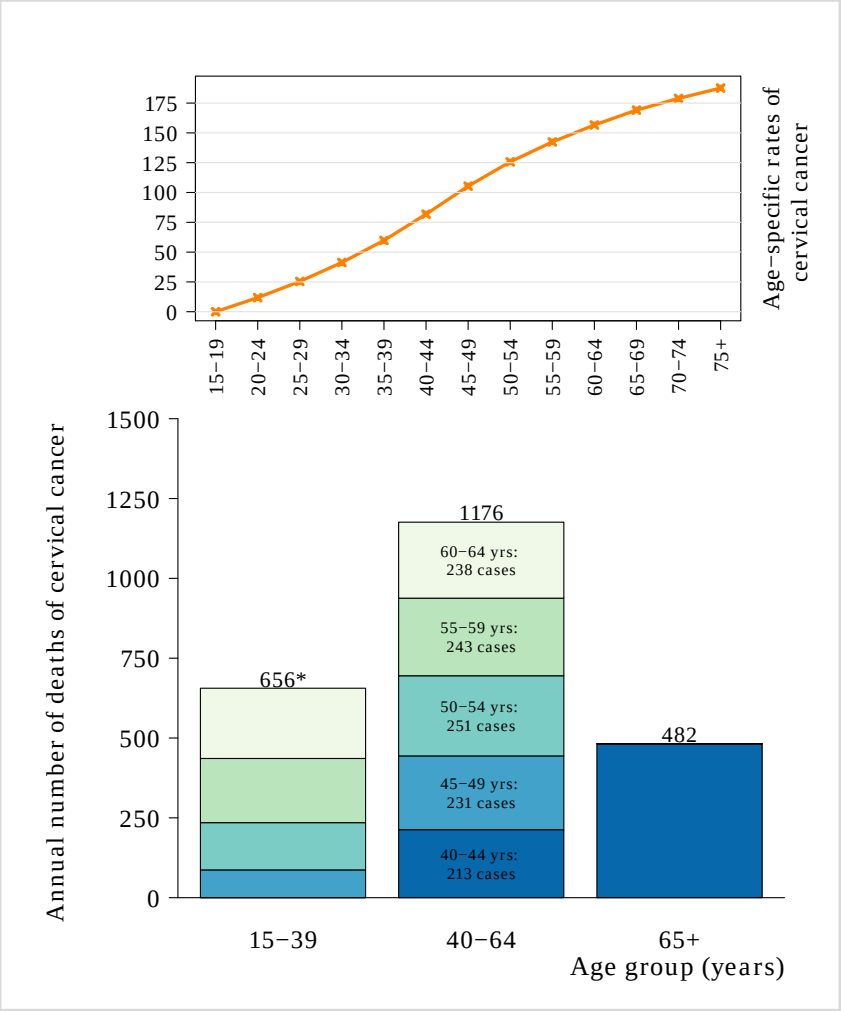
[b] Includes HIV disease resulting in malignant neoplasms (B21).

[c] Includes anal cancer (C21).

Data sources:

Ferlay J, Soerjomataram I, Ervik M, Dikshit R, Eser S, Mathers C, Rebelo M, Parkin DM, Forman D, Bray F. GLOBOCAN 2012 v1.2, Cancer Incidence and Mortality Worldwide: IARC CancerBase No. 11 [Internet]. Lyon, France: International Agency for Research on Cancer; 2013. Available from: http://globocan.iarc.fr.

Figure 13: Annual number of deaths and age-specific mortality rates of cervical cancer in Malawi (estimations for 2012)



* 15-19 yrs: 0 cases. 20-24 yrs: 87 cases. 25-29 yrs: 148 cases. 30-34 yrs: 201 cases. 35-39 yrs: 220 cases.

Data accessed at 15 nov. 2015.

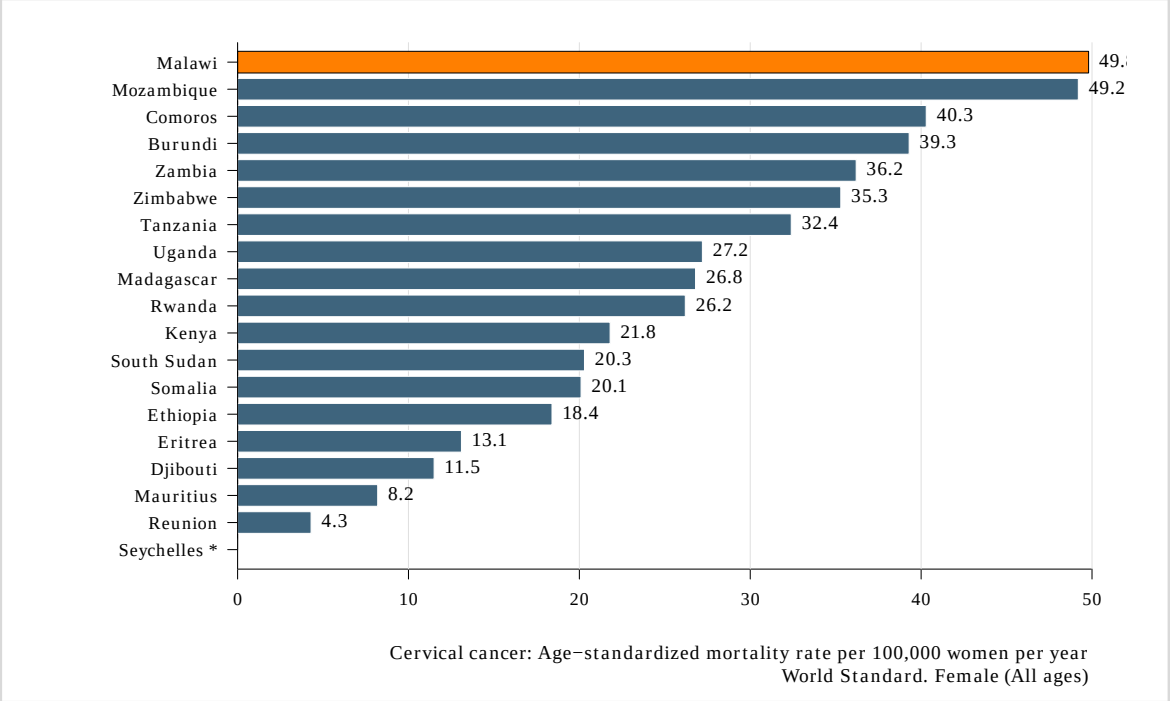
Rates per 100,000 women per year.

Data sources:

Ferlay J, Soerjomataram I, Ervik M, Dikshit R, Eser S, Mathers C, Rebelo M, Parkin DM, Forman D, Bray F. GLOBOCAN 2012 v1.2, Cancer Incidence and Mortality Worldwide: IARC CancerBase No. 11 [Internet]. Lyon, France: International Agency for Research on Cancer; 2013. Available from: http://globocan.iarc.fr.

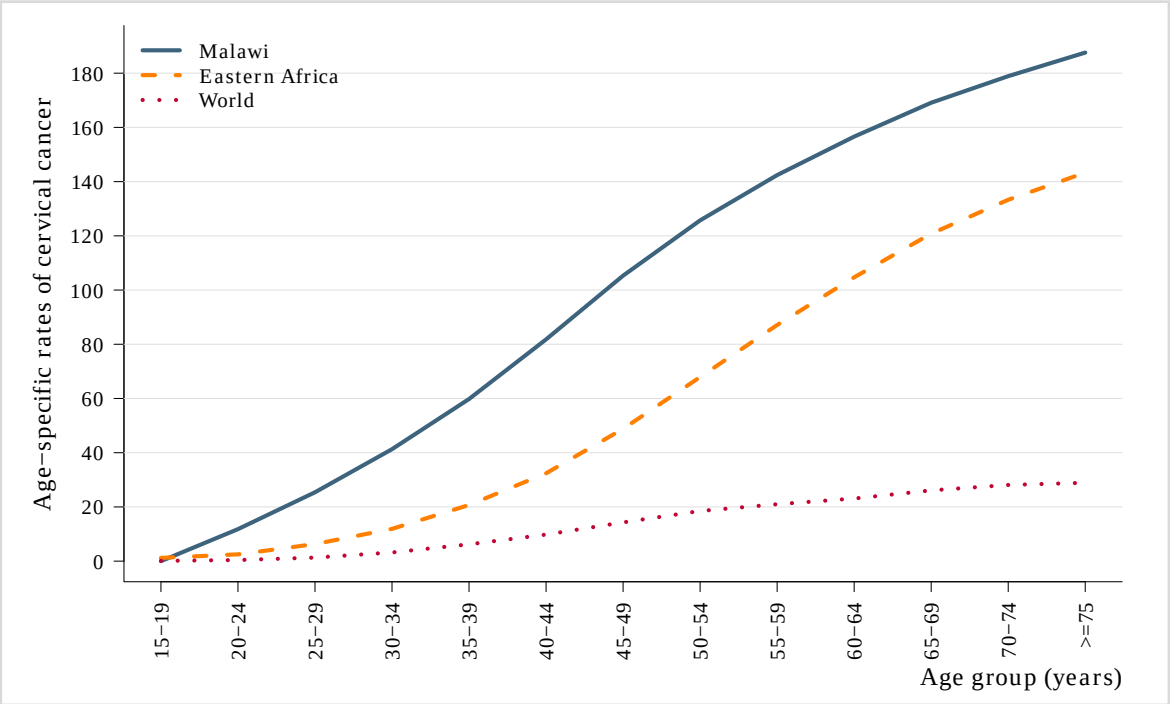
3.1.5 Cervical cancer mortality in Malawi across Eastern Africa

Figure 14: Age-standardized mortality rates of cervical cancer in countries of Malawi (estimations for 2012)



* No rates are available.
Data accessed at 15 nov. 2015.
Rates per 100,000 women per year.
[a] Estimate for Sudan and South Sudan
Data sources:
Ferlay J, Soerjomataram I, Ervik M, Dikshit R, Eser S, Mathers C, Rebelo M, Parkin DM, Forman D, Bray F. GLOBOCAN 2012 v1.2, Cancer Incidence and Mortality Worldwide: IARC CancerBase No. 11 [Internet]. Lyon, France: International Agency for Research on Cancer; 2013. Available from: http://globocan.iarc.fr.

Figure 15: Age-specific mortality rates of cervical cancer in Malawi compared to its region and the world



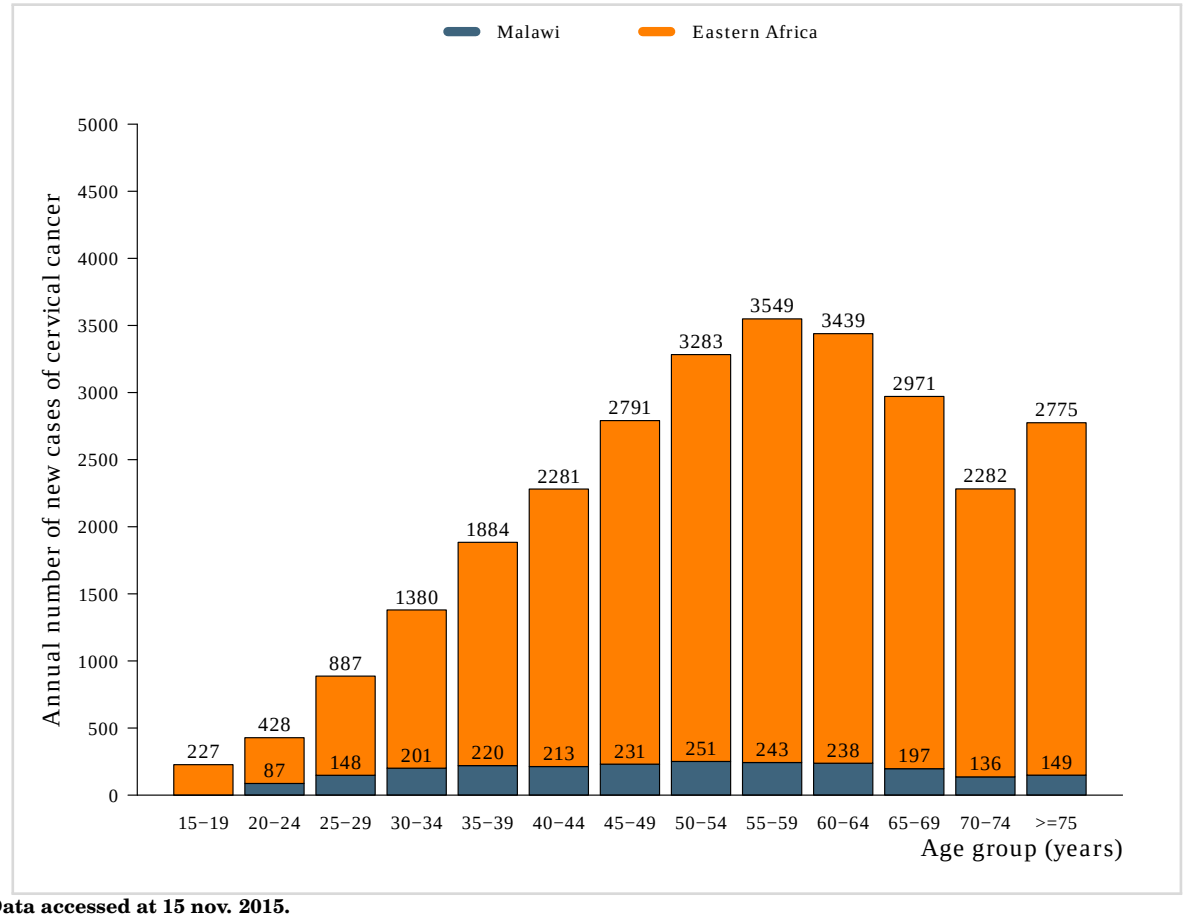
Data accessed at 15 nov. 2015.
Rates per 100,000 women per year.

(Continued on next page)

(Figure 15 – continued from previous page)

Data sources:
Ferlay J, Soerjomataram I, Ervik M, Dikshit R, Eser S, Mathers C, Rebelo M, Parkin DM, Forman D, Bray F. GLOBOCAN 2012 v1.2, Cancer Incidence and Mortality Worldwide: IARC CancerBase No. 11 [Internet]. Lyon, France: International Agency for Research on Cancer; 2013. Available from: http://globocan.iarc.fr.

Figure 16: Annual deaths number of cervical cancer by age group in Malawi (estimations for 2012)

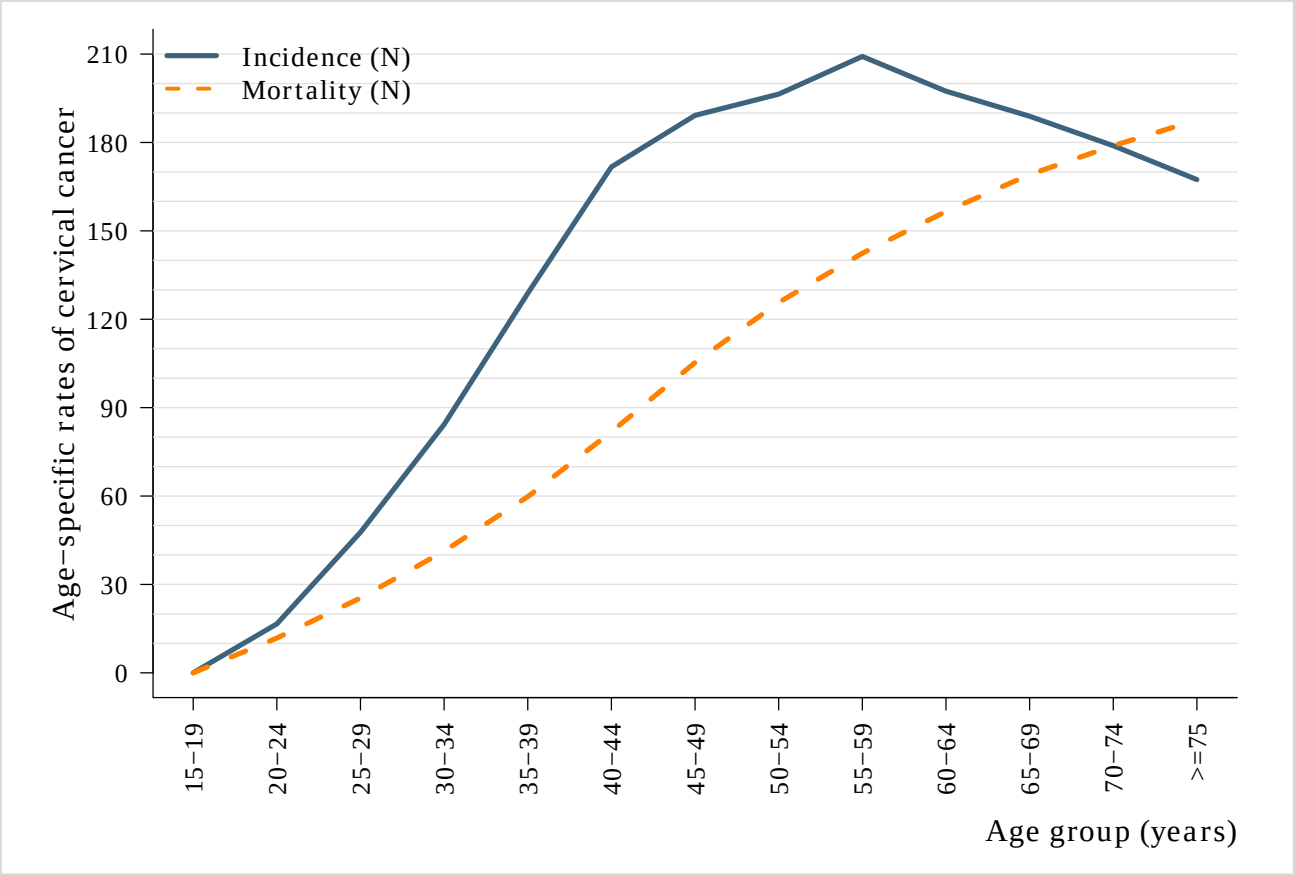


Data accessed at 15 nov. 2015.

Data sources:
Ferlay J, Soerjomataram I, Ervik M, Dikshit R, Eser S, Mathers C, Rebelo M, Parkin DM, Forman D, Bray F. GLOBOCAN 2012 v1.2, Cancer Incidence and Mortality Worldwide: IARC CancerBase No. 11 [Internet]. Lyon, France: International Agency for Research on Cancer; 2013. Available from: http://globocan.iarc.fr.

3.1.6 Cervical cancer incidence and mortality comparison, Premature deaths and disability in Malawi

Figure 17: Comparison of age-specific incidence and mortality rates of cervical cancer in Malawi (estimations for 2012)



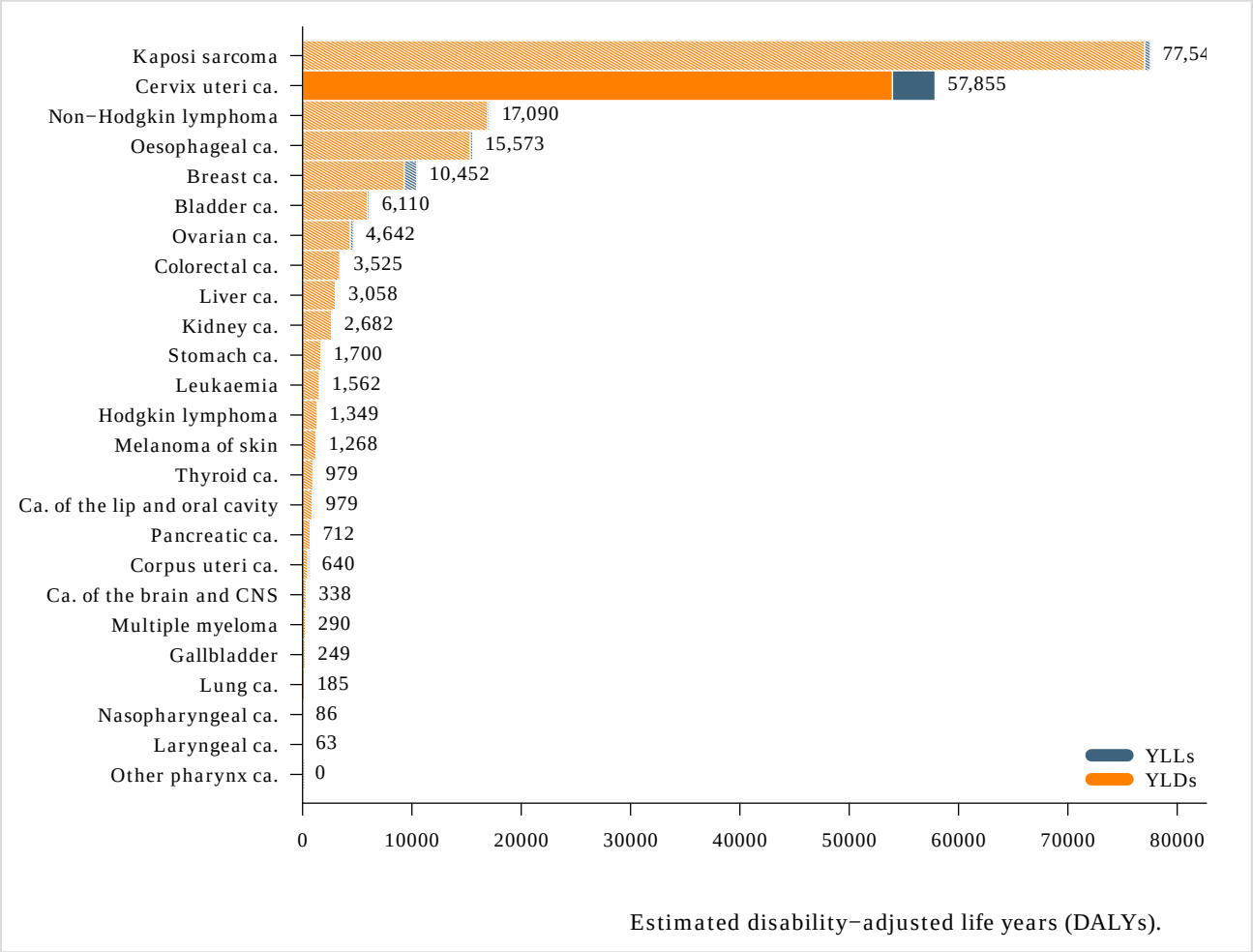
Data accessed at 15 nov. 2015.
Rates per 100,000 women per year.
Data sources:
Ferlay J, Soerjomataram I, Ervik M, Dikshit R, Eser S, Mathers C, Rebelo M, Parkin DM, Forman D, Bray F. GLOBOCAN 2012 v1.2, Cancer Incidence and Mortality Worldwide: IARC CancerBase No. 11 [Internet]. Lyon, France: International Agency for Research on Cancer; 2013. Available from: http://globocan.iarc.fr.

Table 7: Premature deaths and disability from cervical cancer in Malawi, Eastern Africa and World (estimations for 2008)

	Malawi		Eastern Africa		World	
Indicator	**Number**	**ASR (W)**	**Number**	**ASR (W)**	**Number**	**ASR (W)**
Estimated disability-adjusted life years (DALYs)	57,855	1,223	677,131	721	8,738,004	293
Years of life lost (YLLs)	53,959	1,156	634,208	684	7,788,282	264
Years lived with disability (YLDs)	3,896	67	42,922	38	949,722	28

Data accessed at 04 nov. 2013.
Data sources:
Soerjomataram I, Lortet-Tieulent J, Parkin DM, Ferlay J, Mathers C, Forman D, Bray F. Global burden of cancer in 2008: a systematic analysis of disability-adjusted life-years in 12 world regions. Lancet. 2012 Nov 24;380(9856):1840-50.

Figure 18: Number of annual premature deaths and disability from cervical cancer in Malawi compared to other cancers among women (estimations for 2008)



Data accessed at 04 nov. 2013.

CNS: Central Nervous System; YLDs: years lived with disability; YLLs: Years of life lost;

Data sources:

Soerjomataram I, Lortet-Tieulent J, Parkin DM, Ferlay J, Mathers C, Forman D, Bray F. Global burden of cancer in 2008: a systematic analysis of disability-adjusted life-years in 12 world regions. Lancet. 2012 Nov 24;380(9856):1840-50.

3.2 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)*.

3.2.1 Anal cancer

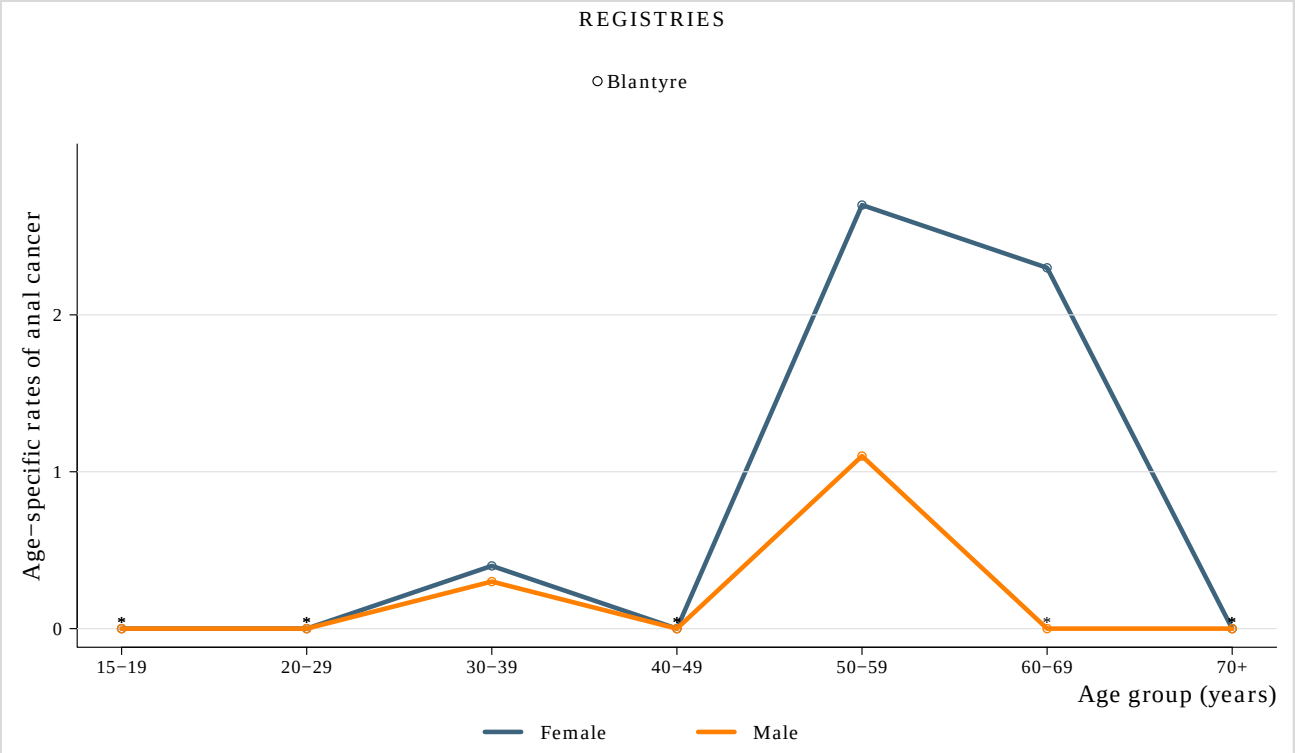
Anal cancer is rare in general population with an average worldwide incidence of 1 per 100,000, but is reported to be increasing in more developed regions. Globally, there are an estimated 27,000 new cases every year *(de Martel C et al. Lancet Oncol 2012;13(6):607-15)*. Women have higher incidences 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.

Table 8: Anal cancer incidence by cancer registry and sex in Malawi (observed cases during the specified period)

		MALE			FEMALE		
Cancer registry[1]	**Period**	**N cases**[a]	**Crude rate**[b]	**ASR**[b]	**N cases**[a]	**Crude rate**[c]	**ASR**[c]
Blantyre	2003-2007	3	0.1	0.2	4	0.2	0.5

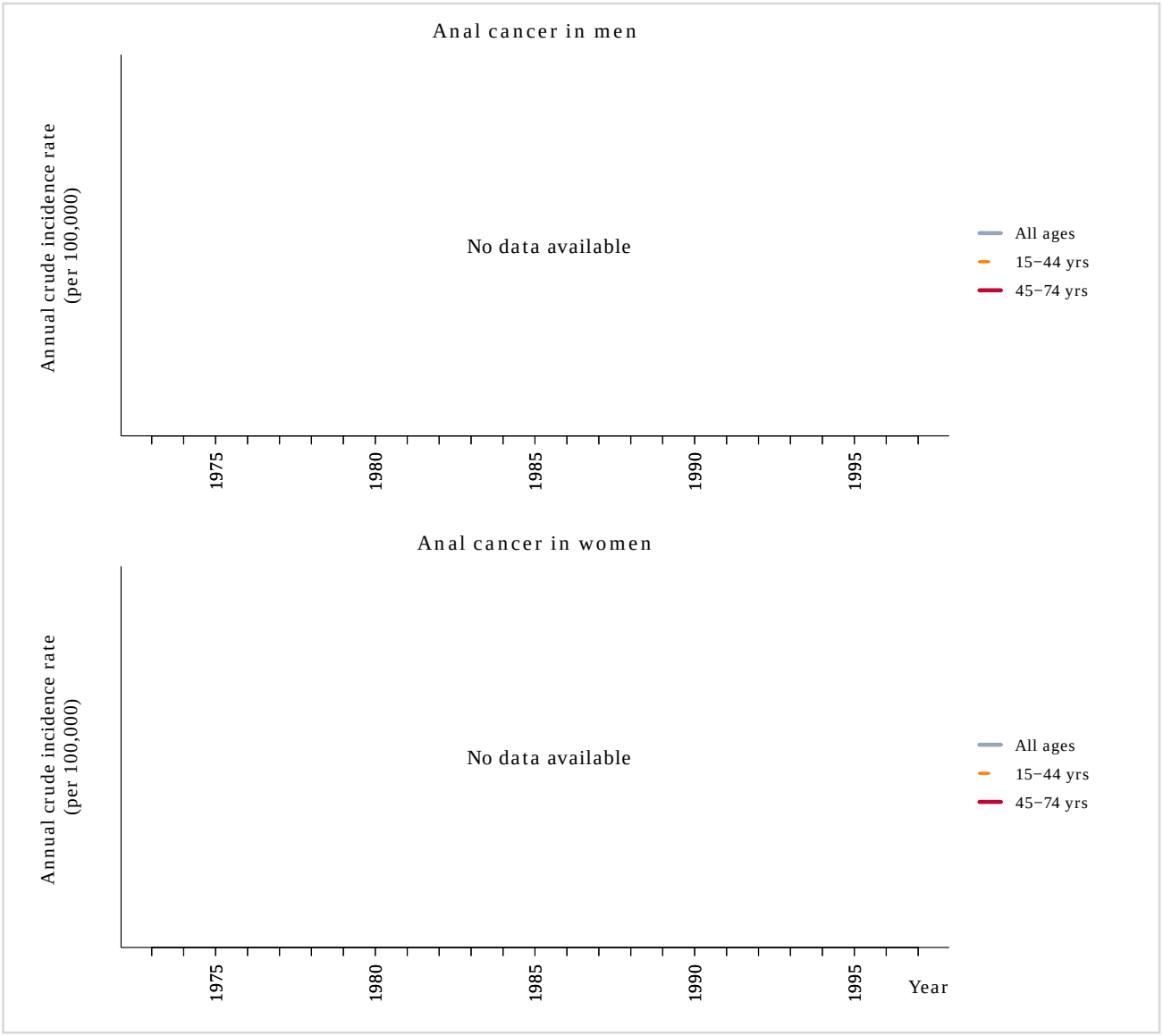
Data accessed at 05 may. 2015.
ASR: Age-standardized rate, Standardized rates have been estimated using the direct method and the World population as the reference;
Please refer to original source (available at http://ci5.iarc.fr/CI5i-ix/ci5i-ix.htm)
[a] Accumulated number of cases during the period in the population covered by the corresponding registry.
[b] Rates per 100,000 men per year.
[c] 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

Figure 19: Anal cancer incidence rates by age group in Malawi (observed cases in the cancer registry)



*No cases were registered for this age group.
Data accessed at 05 may. 2015.
Estimate from Blantyre cancer registry. Rates per 100,000 per year.
Data sources:
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

Figure 20: Time trends in anal cancer incidence in Malawi (observed cases in the selected cancer registries)



Data accessed at 27 abr. 2015.
Data sources:
Ferlay J, Bray F, Steliarova-Foucher E and Forman D. Cancer Incidence in Five Continents, CI5plus: IARC CancerBase No. 9 [Internet]. Lyon, France: International Agency for Research on Cancer; 2014. Available from: http://ci5.iarc.fr

3.2.2 Vulvar cancer

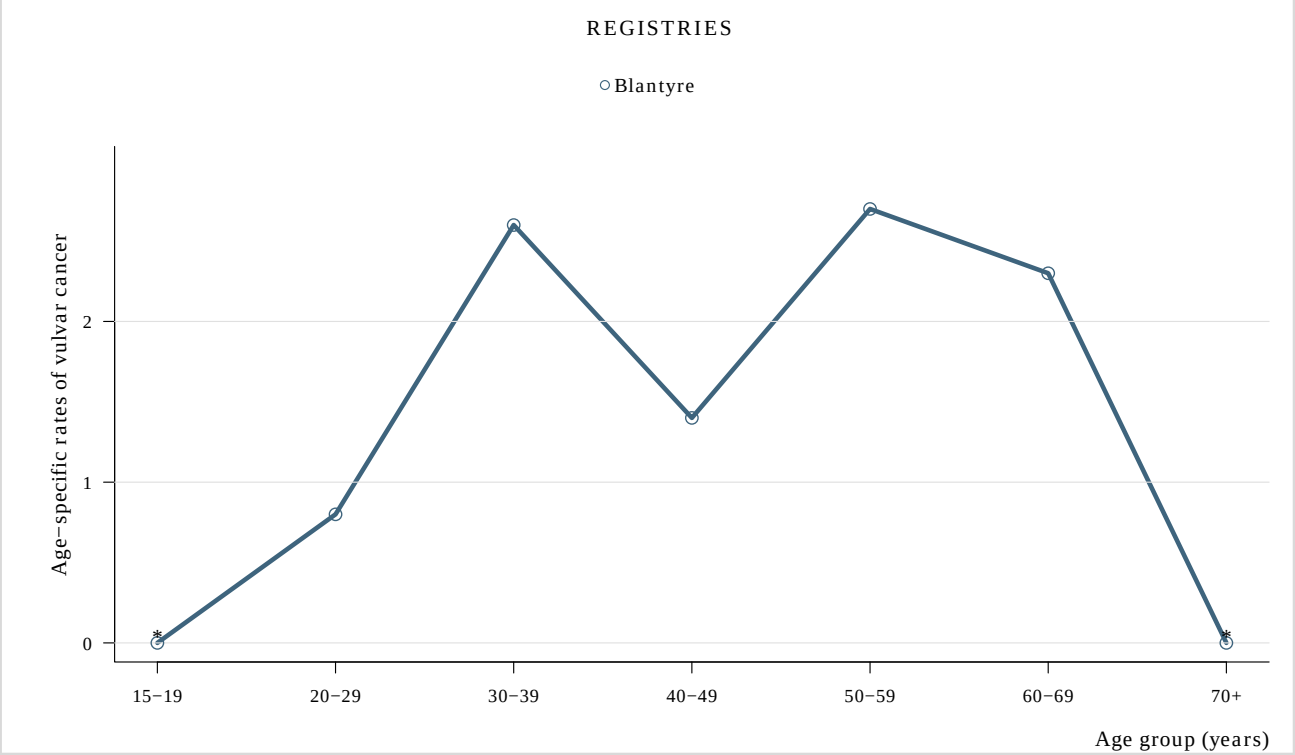
Cancer of the vulva is rare among women worldwide, with an estimated 27,000 new cases in 2008, representing 4% of all gynaecologic cancers *(de Martel C et al. Lancet Oncol 2012;13(6):607-15)*. Worldwide, about 60% of all vulvar cancer cases occur in more developed countries. Vulvar cancer has two distinct histological patterns with two different risk factor profiles: (1) basaloid/warty types (2) keratinizing 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. Keratinizing 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)*.

Table 9: Vulvar cancer incidence by cancer registry in Malawi

Cancer registry[1]	Period	N cases[a]	Crude rate[b]	ASR[b]
Blantyre	2003-2007	16	0.7	1.0

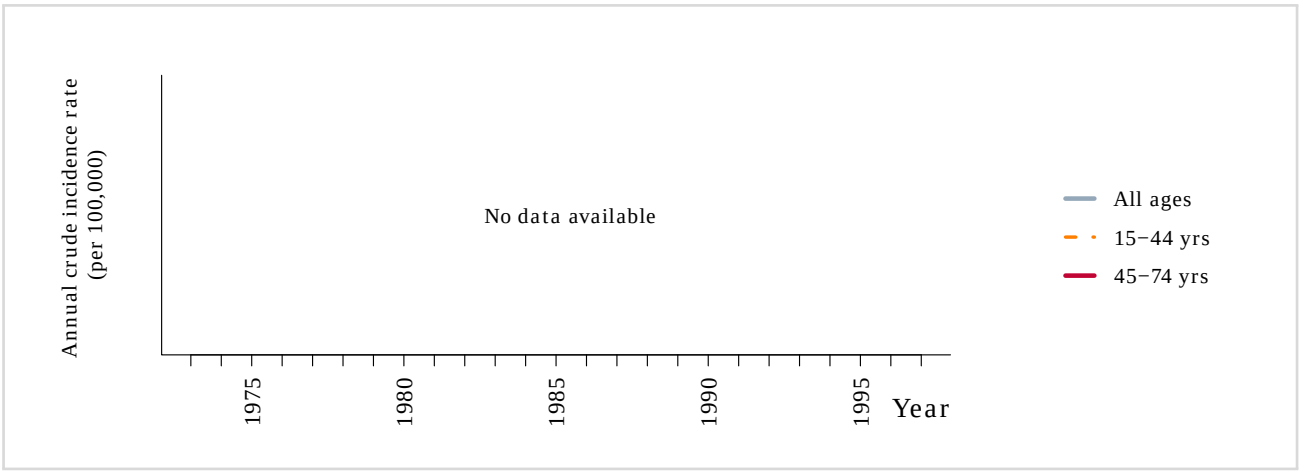
Data accessed at 05 may. 2015.
ASR: Age-standardized rate, Standardized rates have been estimated using the direct method and the World population as the reference;
[a] Accumulated number of cases during the period in the population covered by the corresponding registry.
[b] Rates per 100,000 women per 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

Figure 21: Vulvar cancer incidence rates by age group in Malawi



*No cases were registered for this age group.
Data accessed at 05 may. 2015.
Estimate from Blantyre cancer registry.
Data sources:
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

Figure 22: Time trends in vulvar cancer incidence in Malawi (observed cases in the selected cancer registries)



Data accessed at 27 abr. 2015.

Data sources:

Ferlay J, Bray F, Steliarova-Foucher E and Forman D. Cancer Incidence in Five Continents, CI5plus: IARC CancerBase No. 9 [Internet]. Lyon, France: International Agency for Research on Cancer; 2014. Available from: http://ci5.iarc.fr

3.2.3 Vaginal cancer

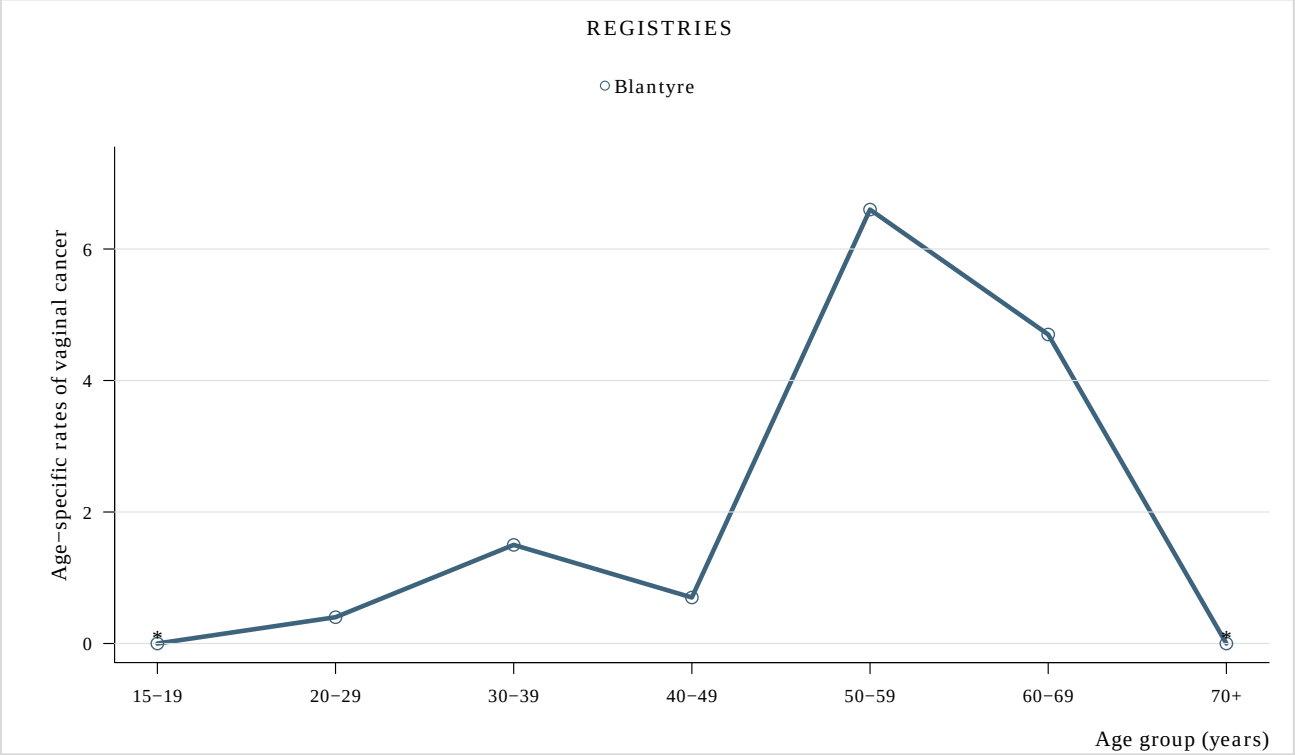
Cancer of the vagina is a rare cancer, with an estimated 13,000 new cases in 2008, representing 2% of all gynaecologic cancers *(de Martel C et al. Lancet Oncol 2012;13(6):607-15)*. Similar to cervical cancer, the majority of vaginal cancer cases (68%) occur in less developed countries. Most vaginal 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)*.

Table 10: Vaginal cancer incidence by cancer registry in Malawi

Cancer registry[1]	Period	N cases[a]	Crude rate[b]	ASR[b]
Blantyre	2003-2007	16	0.7	1.4

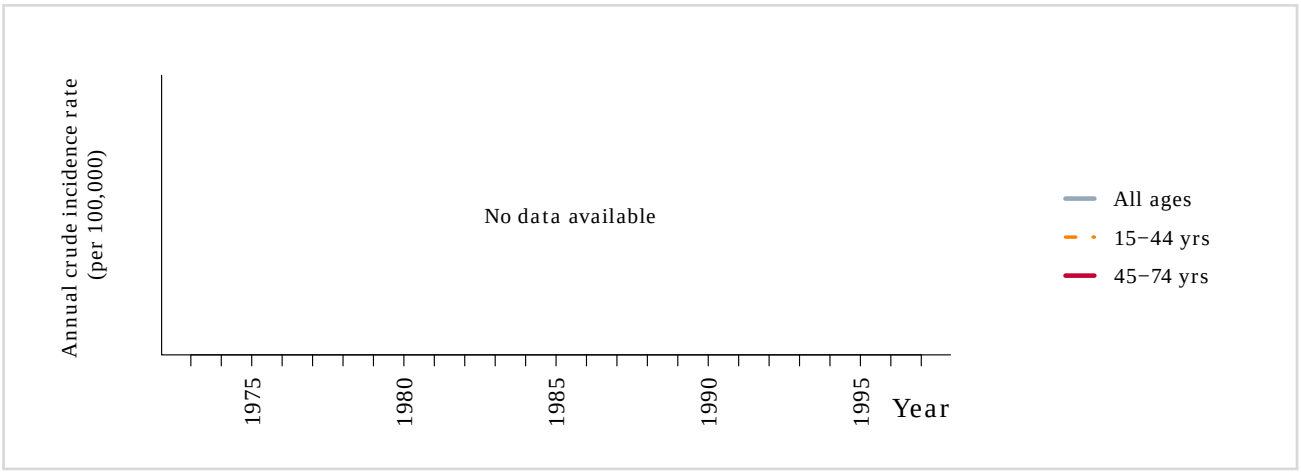
Data accessed at 05 may. 2015.
ASR: Age-standardized rate, Standardized rates have been estimated using the direct method and the World population as the reference;
Please refer to original source (available at http://ci5.iarc.fr/CI5i-ix/ci5i-ix.htm)
[a] Accumulated number of cases during the period 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

Figure 23: Incidence rates of vaginal cancer by age group in Malawi



*No cases were registered for this age group.
Data accessed at 05 may. 2015.
Estimate from Blantyre cancer registry.
[a] Rates per 100,000 per year.
Data sources:
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

Figure 24: Time trends in vaginal cancer incidence in Malawi (observed cases in the selected cancer registries)



Data accessed at 27 abr. 2015.

Data sources:

Ferlay J, Bray F, Steliarova-Foucher E and Forman D. Cancer Incidence in Five Continents, CI5plus: IARC CancerBase No. 9 [Internet]. Lyon, France: International Agency for Research on Cancer; 2014. Available from: http://ci5.iarc.fr

3.2.4 Penile cancer

The annual burden of penile cancer has been estimated to be 22,000 cases worldwide with incidence rates strongly correlating with those of cervical cancer *(de Martel C et al. Lancet Oncol 2012;13(6):607-15)*. 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.

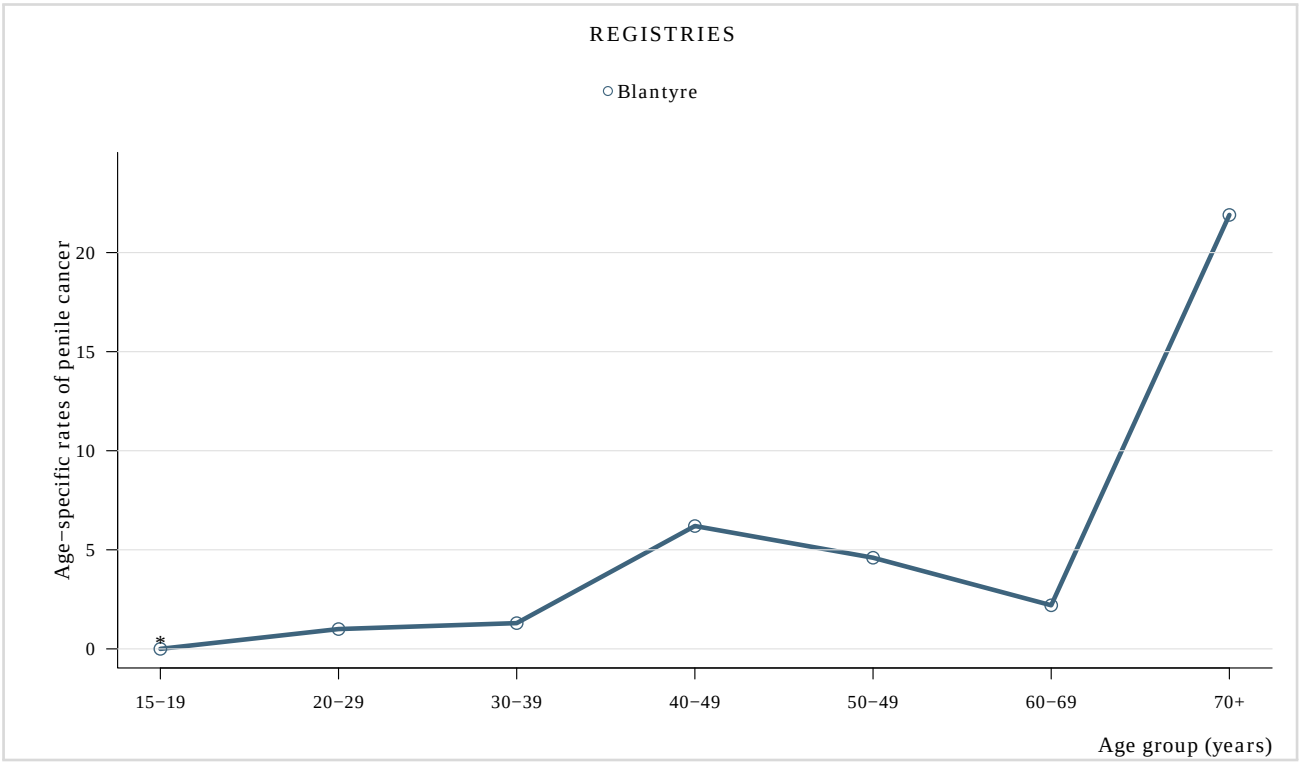
Cancers of the penis are primarily of squamous cell carcinomas (SCC) (95%) and the most common penile SCC histologic sub-types are keratinizing (49%), mixed warty-basaloid (17%), verrucous (8%) warty (6%), and basaloid (4%). HPV is most commonly detected in basaloid and warty tumours but is less common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

Table 11: Penile cancer incidence by cancer registry in Malawi

Cancer registry	Period	N cases[a]	Crude rate[b]	ASR[b]
Blantyre	2003-2007	33	1.4	2.6

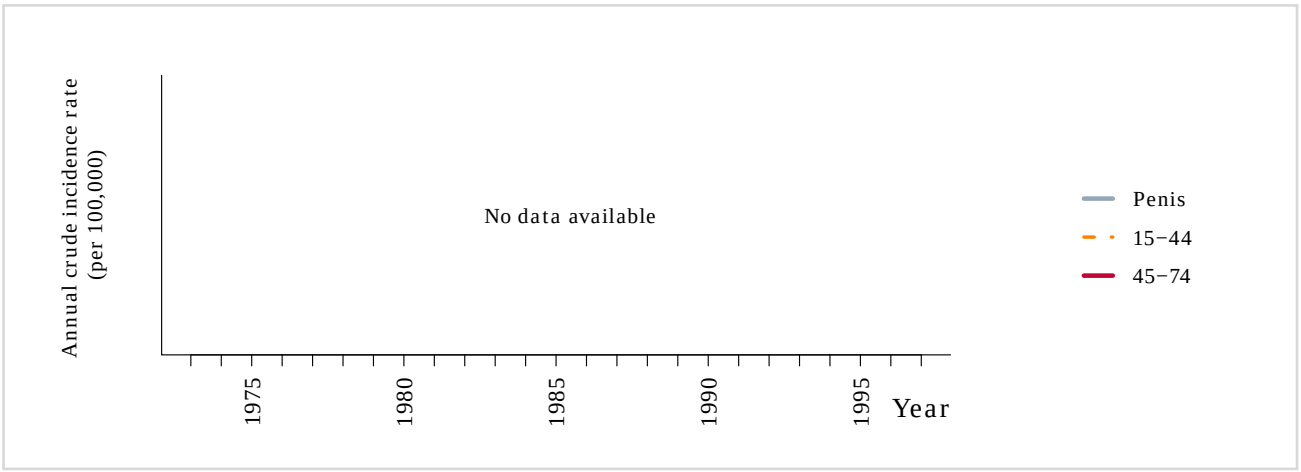
Data accessed at 05 may. 2015.
ASR: Age-standardized rate, Standardized rates have been estimated using the direct method and the World population as the reference;
Please refer to original source (available at http://ci5.iarc.fr/CI5i-ix/ci5i-ix.htm)
[a] Accumulated number of cases during the period in the population covered by the corresponding registry.
[b] Rates per 100,000 men 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

Figure 25: Incidence rates of penile cancer by age group in Malawi



*No cases were registered for this age group.
Data accessed at 05 may. 2015.
Estimate from Blantyre cancer registry. Rates per 100,000 per year.
Data sources:
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

Figure 26: Time trends in penile cancer incidence in Malawi (observed cases in the selected cancer registries)



Data accessed at 27 abr. 2015.

Data sources:

Ferlay J, Bray F, Steliarova-Foucher E and Forman D. Cancer Incidence in Five Continents, CI5plus: IARC CancerBase No. 9 [Internet]. Lyon, France: International Agency for Research on Cancer; 2014. Available from: http://ci5.iarc.fr

3.3 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 etiological factors are involved, and infection by certain high-risk types of human papillomavirus (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)*.

3.3.1 Pharyngeal cancer (excluding nasopharynx)

Table 12: Incidence and mortality of cancer of the pharynx (excluding nasopharynx) by sex in Malawi, Eastern Africa and the World (estimations for 2012). Includes ICD-10 codes: C09-10,C12-14

Indicator	MALE			FEMALE		
	Malawi	Eastern Africa	World	Malawi	Eastern Africa	World
INCIDENCE						
Annual number of new cancer cases	4	906	115,131	0	567	27,256
Crude incidence rate[a]	0.1	0.5	3.2	0.0	0.3	0.8
Age-standardized incidence rate[a]	0.1	1.0	3.2	0.0	0.6	0.7
Cumulative risk (%) at 75 years old[b]	0.0	0.1	0.4	0.0	0.1	0.1
MORTALITY						
Annual number of deaths	4	786	77,585	0	496	18,505
Crude mortality rate[a]	0.1	0.4	2.2	0.0	0.3	0.5
Age-standardized mortality rate[a]	0.1	0.9	2.2	0.0	0.5	0.5
Cumulative risk (%) at 75 years old[c]	0.0	0.1	0.3	0.0	0.1	0.1

Data accessed at 15 nov. 2015.

Incidence data is available from high quality regional (coverage lower than 10%). Data is included in Cancer incidence in Five Continents (CI5) volume IX and/or X. Incidence rates were estimated using one cancer registry covering part of a country as representative of the country profile. For more detailed methods of estimation please refer to http://globocan.iarc.fr/old/method/method.asp?country=454

[a] Male: Rates per 100,000 men per year. Female: Rates per 100,000 women per year.

[b] 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.

[c] 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.

Data sources:

Ferlay J, Soerjomataram I, Ervik M, Dikshit R, Eser S, Mathers C, Rebelo M, Parkin DM, Forman D, Bray F. GLOBOCAN 2012 v1.2, Cancer Incidence and Mortality Worldwide: IARC CancerBase No. 11 [Internet]. Lyon, France: International Agency for Research on Cancer; 2013. Available from: http://globocan.iarc.fr.

Figure 27: Comparison of incidence and mortality rates of the pharynx (excluding nasopharynx) by age group and sex in Malawi (estimations for 2012). Includes ICD-10 codes: C09-10,C12-14

Data accessed at 15 nov. 2015.

Male: Rates per 100,000 men per year. Female: Rates per 100,000 women per year.

Data sources:

Ferlay J, Soerjomataram I, Ervik M, Dikshit R, Eser S, Mathers C, Rebelo M, Parkin DM, Forman D, Bray F. GLOBOCAN 2012 v1.2, Cancer Incidence and Mortality Worldwide: IARC CancerBase No. 11 [Internet]. Lyon, France: International Agency for Research on Cancer; 2013. Available from: http://globocan.iarc.fr.

Table 13: Incidence of oropharyngeal cancer by cancer registry and sex in Malawi

Cancer registry[1]	Period	MALE			FEMALE		
		N cases[a]	Crude rate[b]	ASR[b]	N cases[a]	Crude rate[b]	ASR[b]
Base of tongue (ICD-10 code: C01)							
Blantyre	2003-2007	1	0.0	0.1	1	0.0	0.1
Tonsillar cancer (ICD-10 code: C09)							
Blantyre	2003-2007	1	0.0	0.1	0	0.0	0.0
Cancer of the oropharynx (excludes tonsil) (ICD-10 code: C10)							
Blantyre	2003-2007	0	0.0	0.0	0	0.0	0.0

Data accessed between 23 sep. 2013 to 05 may. 2015.

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

Please refer to original source (available at http://ci5.iarc.fr/CI5i-ix/ci5i-ix.htm)

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

[b] Male: Rates per 100,000 men per year. Female: 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

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 cautiously and used only as a guidance to assess the burden of HPV infection in 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).

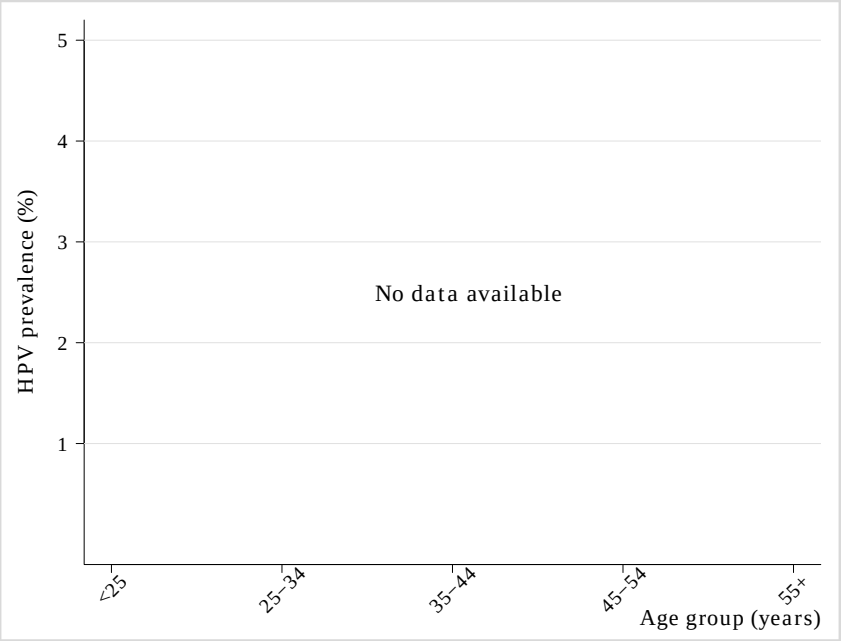
The prevalence of HPV increases with lesion severity. HPV causes virtually 100% of cervical cancer cases, and an underestimation of HPV prevalence in cervical cancer is most likely due to the limitations of study methodologies. Worldwide, HPV16 and 18 (the two vaccine-preventable types) contribute to 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

Systematic review of the literature was conducted on 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. Search terms 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 high-grade cervical lesions and 100 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 28: Crude age-specific HPV prevalence (%) and 95% confidence interval (grey shadow) in women with normal cervical cytology in Malawi



Data updated at 15 dic. 2014 (data as of 31 oct. 2014).

Data sources:

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

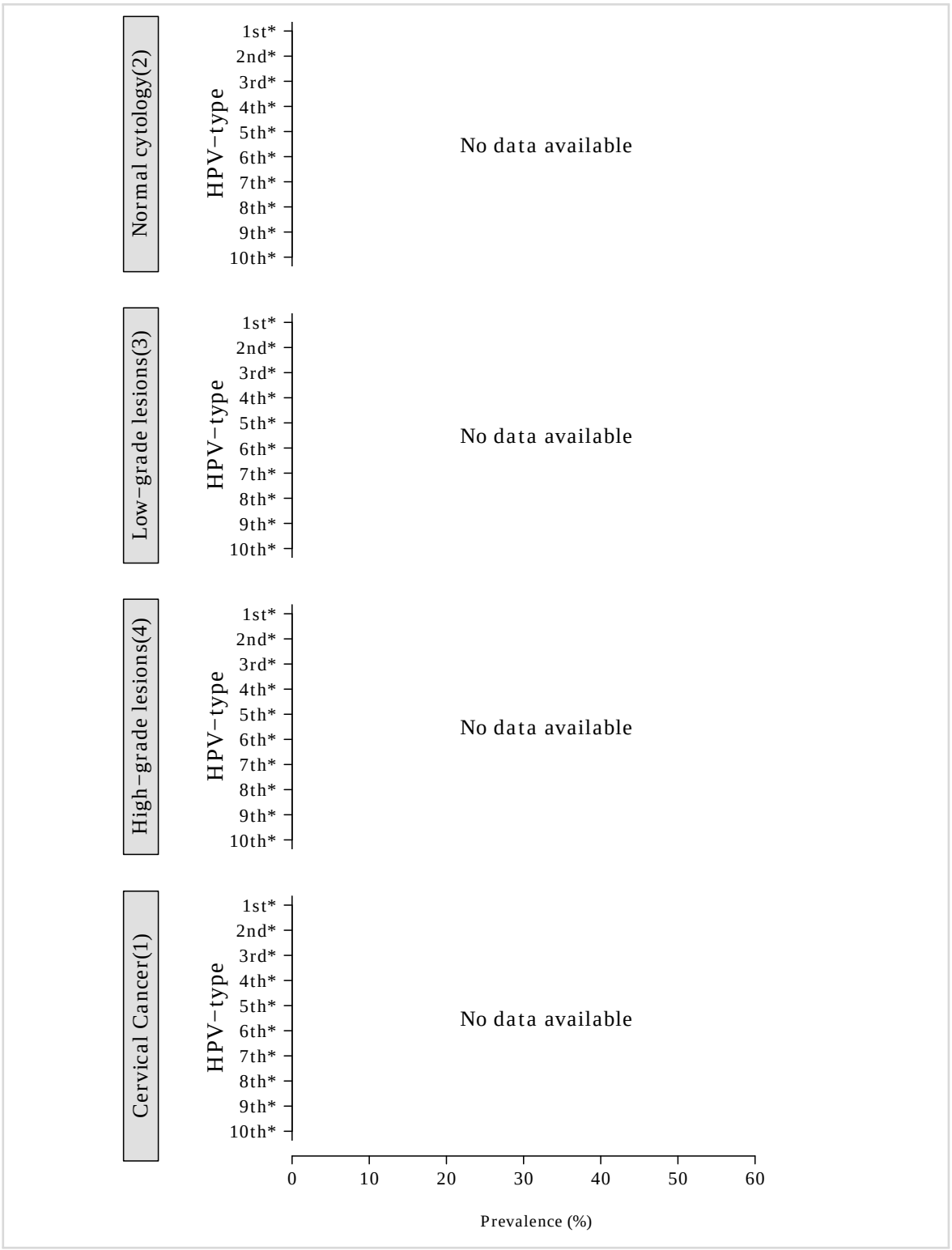
4.1.2 HPV type distribution among women with normal cervical cytology, precancerous cervical lesions and cervical cancer

Table 14: Prevalence of HPV16 and HPV18 by cytology in Malawi

	No. tested	HPV 16/18 Prevalence % (95% CI)
Normal cytology[1]	-	- -
Low-grade lesions[2]	-	- -
High-grade lesions[3]	-	- -
Cervical cancer[4]	-	- -

Data updated at 15 dic. 2014 (data as of 30 jun. 2014 / 31 oct. 2014).
95% CI: 95% Confidence Interval; High-grade lesions: CIN-2, CIN-3, CIS or HSIL; Low-grade lesions: LSIL or CIN-1;
The samples for HPV testing come from cervical specimens (fresh / fixed biopsies or exfoliated cells)
Data sources:
[1]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
[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) Clifford GM, Cancer Epidemiol Biomarkers Prev 2005;14:1157
[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 2014. 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.
[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 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.

Figure 29: Ten most frequent HPV oncogenic types among women with and without cervical lesions in Malawi



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

Data updated at 15 dic. 2014 (data as of 30 jun. 2014 / 31 oct. 2014).

High-grade lesions: CIN-2, CIN-3, CIS or HSIL; Low-grade lesions: LSIL or CIN-1;

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

Data sources:

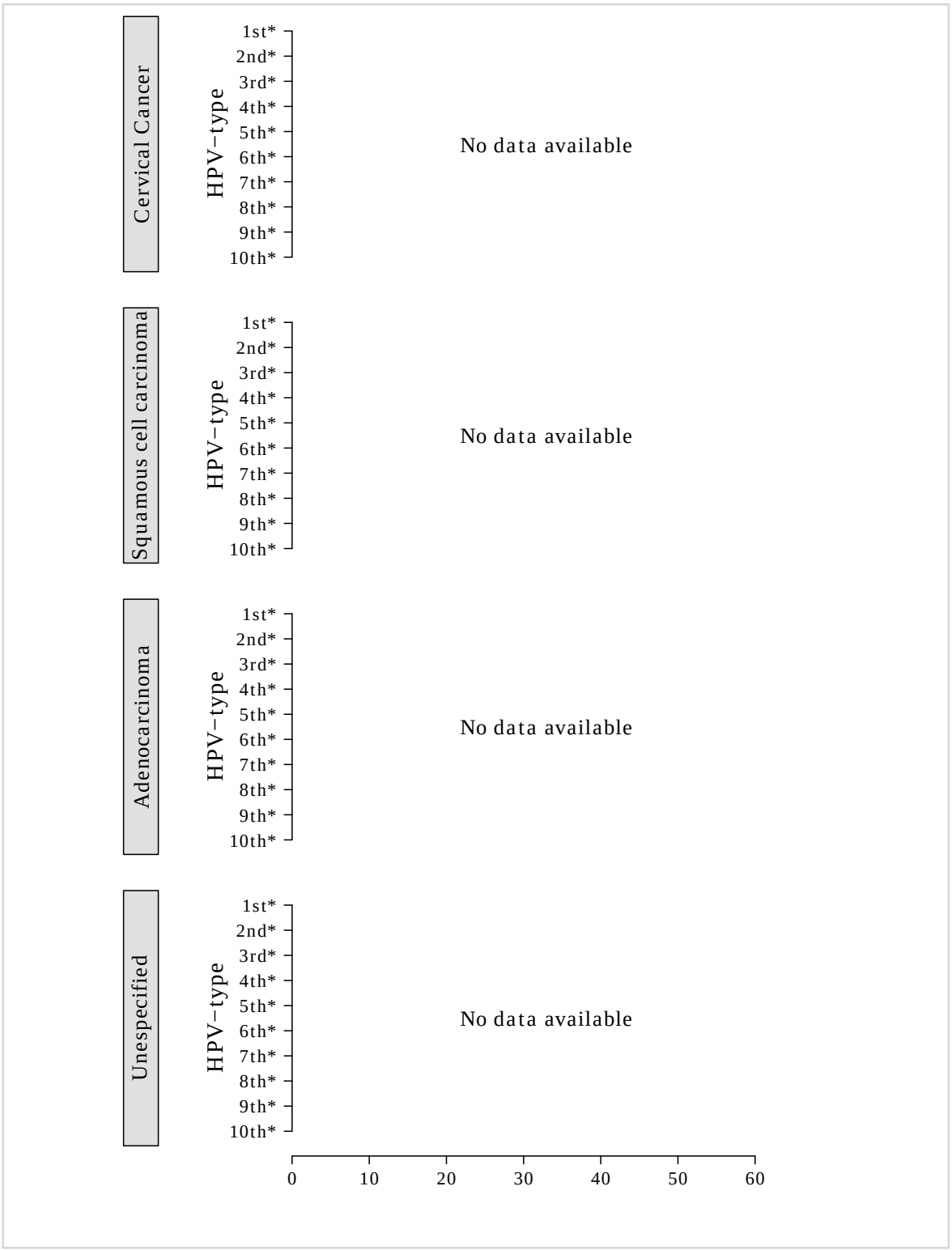
[1]Based on meta-analysis performed by IARC's Infections and Cancer Epidemiology Group up to November 2011, the ICO HPV Information Centre has updated data until June 2014. Reference publications: 1) Guan P, Int J Cancer 2012;131:2349 2) Li N, Int J Cancer 2011;128:927 3) Smith JS, Int J Cancer 2007;121:621 4) Clifford GM, Br J Cancer 2003;88:63 5) Clifford GM, Br J Cancer 2003;89:101.

[2]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

[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 2014. Reference publications: 1) Guan P, Int J Cancer 2012;131:2349 2) Clifford GM, Cancer Epidemiol Biomarkers Prev 2005;14:1157

[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 2014. 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 30: Ten most frequent HPV oncogenic types among women with invasive cervical cancer by histology in Malawi



Data updated at 15 dic. 2014 (data as of 30 jun. 2014).

The samples for HPV testing come from cervical specimens (fresh / fixed biopsies or exfoliated cells). The ranking of the ten most frequent HPV types may present less than ten types beause only a limited number of types were tested or were HPV-positive.

Data sources:

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.

Table 15: Type-specific HPV prevalence in women with normal cervical cytology, precancerous cervical lesions and invasive cervical cancer in Malawi

HPV Type	Normal cytology[1] No. tested	Normal cytology[1] HPV Prev % (95% CI)	Low-grade lesions[2] No. tested	Low-grade lesions[2] HPV Prev % (95% CI)	High-grade lesions[3] No. tested	High-grade lesions[3] HPV Prev % (95% CI)	Cervical cancer[4] No. tested	Cervical cancer[4] HPV Prev % (95% CI)
ONCOGENIC HPV TYPES								
16	-	- -	-	- -	-	- -	-	- -
18	-	- -	-	- -	-	- -	-	- -
31	-	- -	-	- -	-	- -	-	- -
33	-	- -	-	- -	-	- -	-	- -
35	-	- -	-	- -	-	- -	-	- -
39	-	- -	-	- -	-	- -	-	- -
45	-	- -	-	- -	-	- -	-	- -
51	-	- -	-	- -	-	- -	-	- -
52	-	- -	-	- -	-	- -	-	- -
56	-	- -	-	- -	-	- -	-	- -
58	-	- -	-	- -	-	- -	-	- -
59	-	- -	-	- -	-	- -	-	- -
68	-	- -	-	- -	-	- -	-	- -
26	-	- -	-	- -	-	- -	-	- -
53	-	- -	-	- -	-	- -	-	- -
66	-	- -	-	- -	-	- -	-	- -
67	-	- -	-	- -	-	- -	-	- -
70	-	- -	-	- -	-	- -	-	- -
73	-	- -	-	- -	-	- -	-	- -
82	-	- -	-	- -	-	- -	-	- -
NON-ONCOGENIC HPV TYPES								
6	-	- -	-	- -	-	- -	-	- -
11	-	- -	-	- -	-	- -	-	- -
30	-	- -	-	- -	-	- -	-	- -
34	-	- -	-	- -	-	- -	-	- -
40	-	- -	-	- -	-	- -	-	- -
42	-	- -	-	- -	-	- -	-	- -
43	-	- -	-	- -	-	- -	-	- -
44	-	- -	-	- -	-	- -	-	- -
54	-	- -	-	- -	-	- -	-	- -
61	-	- -	-	- -	-	- -	-	- -
62	-	- -	-	- -	-	- -	-	- -
69	-	- -	-	- -	-	- -	-	- -
71	-	- -	-	- -	-	- -	-	- -
72	-	- -	-	- -	-	- -	-	- -
74	-	- -	-	- -	-	- -	-	- -
81	-	- -	-	- -	-	- -	-	- -
83	-	- -	-	- -	-	- -	-	- -
84	-	- -	-	- -	-	- -	-	- -
89	-	- -	-	- -	-	- -	-	- -

Data updated at 15 dic. 2014 (data as of 30 jun. 2014 / 31 oct. 2014).

95% CI: 95% Confidence Interval; High-grade lesions: CIN-2, CIN-3, CIS or HSIL; Low-grade lesions: LSIL or CIN-1;

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

Data sources:

[1]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

[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) Clifford GM, Cancer Epidemiol Biomarkers Prev 2005;14:1157

[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 2014. 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.

[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 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.

Table 16: Type-specific HPV prevalence among invasive cervical cancer cases in Malawi by histology

HPV Type	Any Histology		Squamous cell carcinoma		Adenocarcinoma		Unespecified	
	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								
16	-	- -	-	- -	-	- -	-	- -
18	-	- -	-	- -	-	- -	-	- -
31	-	- -	-	- -	-	- -	-	- -
33	-	- -	-	- -	-	- -	-	- -
35	-	- -	-	- -	-	- -	-	- -
39	-	- -	-	- -	-	- -	-	- -
45	-	- -	-	- -	-	- -	-	- -
51	-	- -	-	- -	-	- -	-	- -
52	-	- -	-	- -	-	- -	-	- -
56	-	- -	-	- -	-	- -	-	- -
58	-	- -	-	- -	-	- -	-	- -
59	-	- -	-	- -	-	- -	-	- -
68	-	- -	-	- -	-	- -	-	- -
53	-	- -	-	- -	-	- -	-	- -
66	-	- -	-	- -	-	- -	-	- -
67	-	- -	-	- -	-	- -	-	- -
70	-	- -	-	- -	-	- -	-	- -
73	-	- -	-	- -	-	- -	-	- -
82	-	- -	-	- -	-	- -	-	- -
NON-ONCOGENIC HPV TYPES								
6	-	- -	-	- -	-	- -	-	- -
11	-	- -	-	- -	-	- -	-	- -
30	-	- -	-	- -	-	- -	-	- -
34	-	- -	-	- -	-	- -	-	- -
42	-	- -	-	- -	-	- -	-	- -
44	-	- -	-	- -	-	- -	-	- -
54	-	- -	-	- -	-	- -	-	- -
62	-	- -	-	- -	-	- -	-	- -
69	-	- -	-	- -	-	- -	-	- -
71	-	- -	-	- -	-	- -	-	- -

Data updated at 15 dic. 2014 (data as of 30 jun. 2014).

95% CI: 95% Confidence Interval;

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

Data sources:

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.

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

Table 17: Studies on HPV prevalence among HIV women with normal cytology in Malawi

Study	HPV detection method and targeted HPV types	No. Tested	HPV prevalence %	HPV prevalence (95% CI)	Prevalence of 5 most frequent HPVs HPV type (%)
No Data Available	-	-	-	-	-

Data updated at 31 jul. 2013 (data as of 31 dic. 2011). Only for European countries.
95% CI: 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

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. Search terms 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 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.

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 88% of cases associated with HPV infection worldwide *(de Martel C et al. Lancet Oncol 2012;13(6):607-15)*. HPV16 is the most common detected type, 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 in Malawi is presented.

Table 18: Studies on HPV prevalence among anal cancer cases in Malawi

Study	HPV detection method and targeted HPV types	No. Tested	HPV prevalence %	HPV prevalence (95% CI)	Prevalence of 5 most frequent HPVs HPV type (%)
No Data Available	-	-	-	-	-

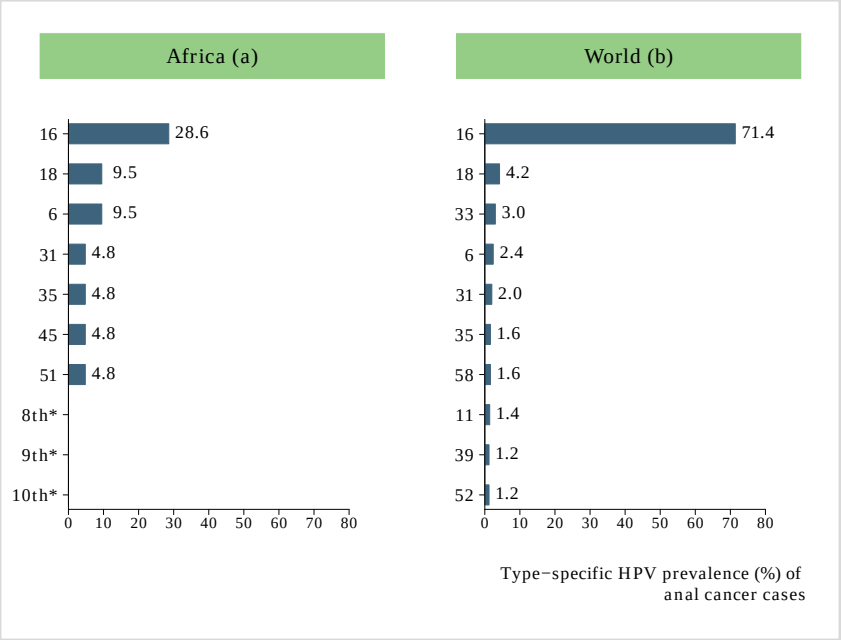
Data updated at 15 dic. 2014 (data as of 30 jun. 2014).
95% CI: 95% Confidence Interval;
Data sources:
Based on systematic reviews (up to 2008) performed by ICO for the IARC Monograph on the Evaluation of Carcinogenic Risks to Humans volume 100B and IARC's Infections and Cancer Epidemiology Group. The ICO HPV Information Centre has updated data until June 2014. Reference publications: 1) Bouvard V, Lancet Oncol 2009;10:321 2) De Vuyst H, Int J Cancer 2009;124:1626

Table 19: Studies on HPV prevalence among cases of AIN2/3 in Malawi

Study	HPV detection method and targeted HPV types	No. Tested	HPV prevalence %	HPV prevalence (95% CI)	Prevalence of 5 most frequent HPVs HPV type (%)
No Data Available	-	-	-	-	-

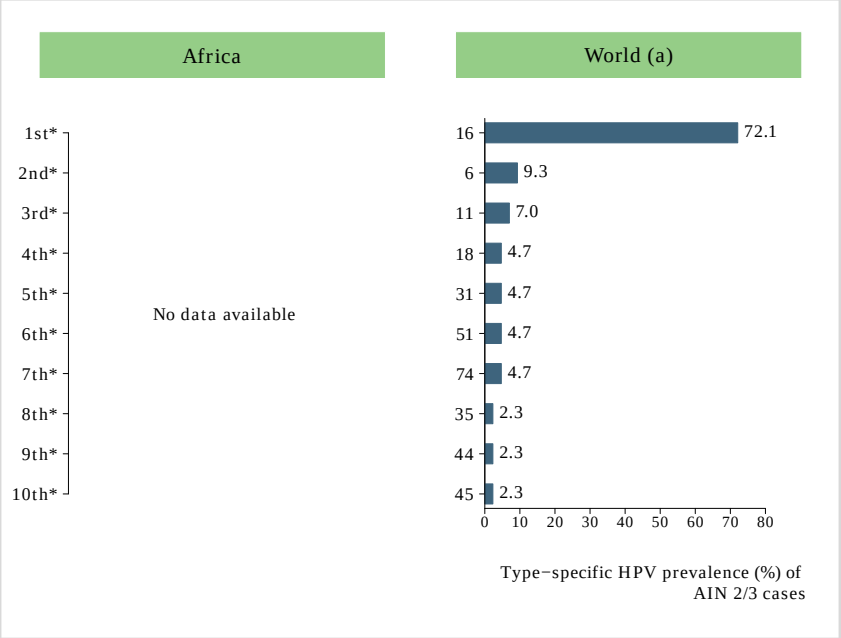
Data updated at 15 dic. 2014 (data as of 30 jun. 2014).
95% CI: 95% Confidence Interval; AIN 2/3: Anal intraepithelial neoplasia of grade 2/3;
Data sources:
Based on systematic reviews (up to 2008) performed by ICO for the IARC Monograph on the Evaluation of Carcinogenic Risks to Humans volume 100B and IARC's Infections and Cancer Epidemiology Group. The ICO HPV Information Centre has updated data until June 2014. Reference publications: 1) Bouvard V, Lancet Oncol 2009;10:321 2) De Vuyst H, Int J Cancer 2009;124:1626

Figure 31: Ten most frequent HPV types among anal cancer cases in Africa compared to the World



*No data available. No more types than shown were tested or were positive. **Data updated at 20 mar. 2015 (data as of 30 jun. 2014).**
[a] Includes cases from Mali, Nigeria and Senegal.
[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 32: Ten most frequent HPV types among AIN 2/3 cases in Africa compared to the World



*No data available. No more types than shown were tested or were positive. **Data updated at 20 mar. 2015 (data as of 30 jun. 2014).**
AIN 2/3: Anal intraepithelial neoplasia of grade 2/3;
[a] Includes cases from Europe (Bosnia-Herzegovina, Czech Republic, France, Germany, Poland, Portugal, Slovenia, Spain and United Kingdom); America (Chile, Colombia, Ecuador, Guatemala, Honduras, Mexico and 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 43% worldwide *(de Martel C et al. Lancet Oncol 2012;13(6):607-15)*. Vulvar cancer has two distinct histological patterns with two different risk factor profiles: (1) basaloid/warty types (2) keratinizing 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. Keratinizing 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 detected type 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 cancers in Malawi is presented.

Table 20: Studies on HPV prevalence among vulvar cancer cases in Malawi

Study	HPV detection method and targeted HPV types	No. Tested	HPV prevalence %	HPV prevalence (95% CI)	Prevalence of 5 most frequent HPVs HPV type (%)
No Data Available	-	-	-	-	-

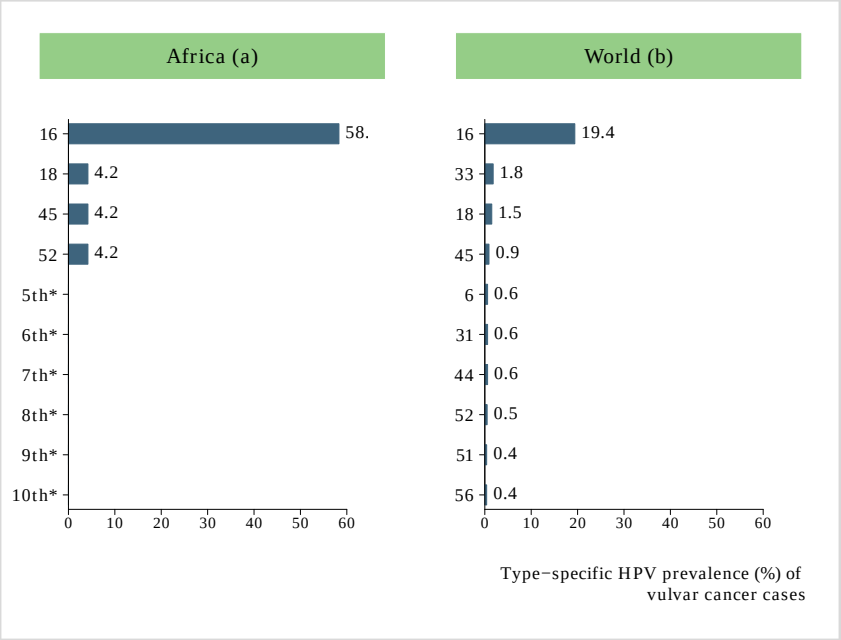
Data updated at 15 dic. 2014 (data as of 30 jun. 2014).
95% CI: 95% Confidence Interval;
Data sources:
Based on systematic reviews (up to 2008) performed by ICO for the IARC Monograph on the Evaluation of Carcinogenic Risks to Humans volume 100B and IARC's Infections and Cancer Epidemiology Group. The ICO HPV Information Centre has updated data until June 2014. Reference publications: 1) Bouvard V, Lancet Oncol 2009;10:321 2) De Vuyst H, Int J Cancer 2009;124:1626

Table 21: Studies on HPV prevalence among VIN 2/3 cases in Malawi

Study	HPV detection method and targeted HPV types	No. Tested	HPV prevalence %	HPV prevalence (95% CI)	Prevalence of 5 most frequent HPVs HPV type (%)
No Data Available	-	-	-	-	-

Data updated at 15 dic. 2014 (data as of 30 jun. 2014).
95% CI: 95% Confidence Interval; VIN 2/3: Vulvar intraepithelial neoplasia of grade 2/3;
Data sources:
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 2014. Reference publications: 1) Bouvard V, Lancet Oncol 2009;10:321 2) De Vuyst H, Int J Cancer 2009;124:1626

Figure 33: Ten most frequent HPV types among cases of vulvar cancer in Africa compared to the World



*No data available. No more types than shown were tested or were positive. **Data updated at 20 mar. 2015 (data as of 30 jun. 2014).**

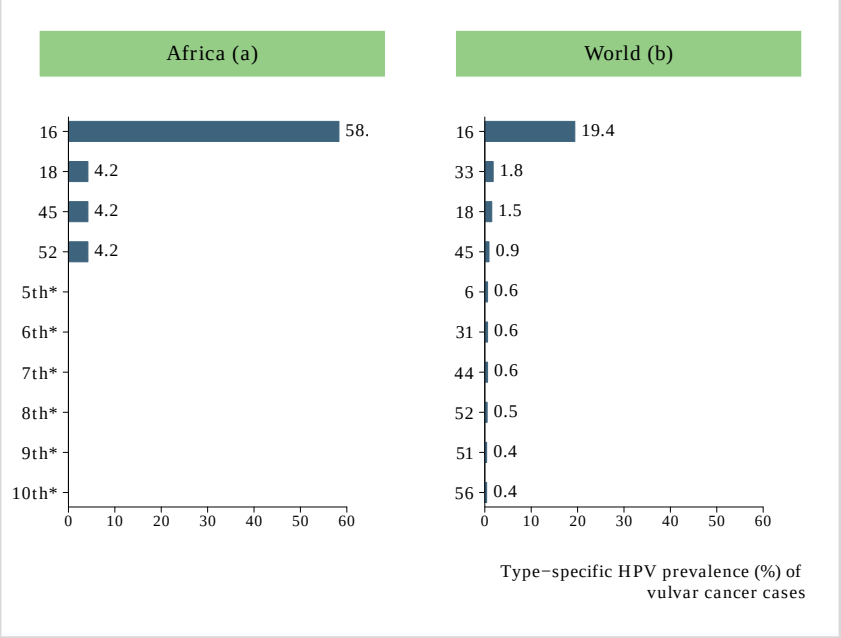
[a] Includes cases from Mali, Mozambique, Nigeria, and Senegal.

[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 34: Ten most frequent HPV types among cases of vulvar cancer in Africa compared to the World



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

Data updated at 20 mar. 2015 (data as of 30 jun. 2014).

[a] Includes cases from Mali, Mozambique, Nigeria, and Senegal.

[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.

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 70% 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 70% of HPV-positive carcinomas *(de Martel C et al. Lancet Oncol 2012;13(6):607-15; De Vuyst H et al. Int J Cancer 2009; 124:1626-36)*. In this section, the HPV burden among cases of vaginal cancers in Malawi is presented.

Table 22: Studies on HPV prevalence among vaginal cancer cases in Malawi

Study	HPV detection method and targeted HPV types	No. Tested	HPV prevalence %	HPV prevalence (95% CI)	Prevalence of 5 most frequent HPVs HPV type (%)
No Data Available	-	-	-	-	-

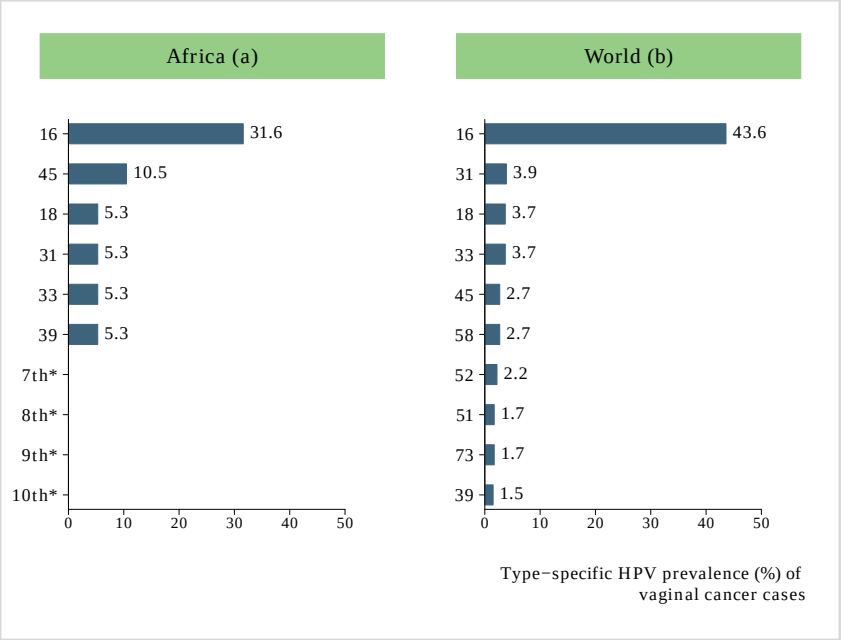
Data updated at 15 dic. 2014 (data as of 30 jun. 2014).
95% CI: 95% Confidence Interval;
Data sources:
Based on systematic reviews (up to 2008) performed by ICO for the IARC Monograph on the Evaluation of Carcinogenic Risks to Humans volume 100B and IARC's Infections and Cancer Epidemiology Group. The ICO HPV Information Centre has updated data until June 2014. Reference publications: 1) Bouvard V, Lancet Oncol 2009;10:321 2) De Vuyst H, Int J Cancer 2009;124:1626

Table 23: Studies on HPV prevalence among VAIN 2/3 cases in Malawi

Study	HPV detection method and targeted HPV types	No. Tested	HPV prevalence %	HPV prevalence (95% CI)	Prevalence of 5 most frequent HPVs HPV type (%)
No Data Available	-	-	-	-	-

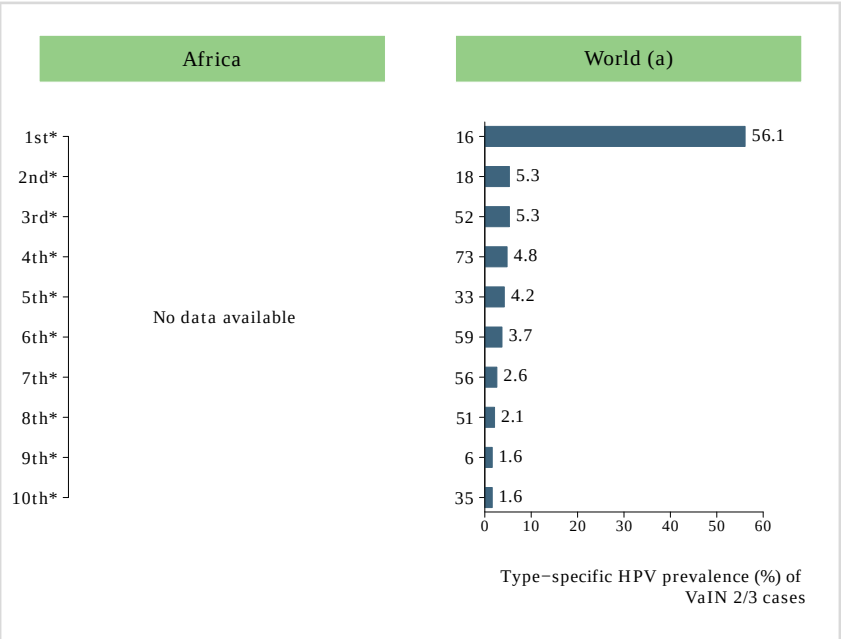
Data updated at 15 dic. 2014 (data as of 30 jun. 2014).
95% CI: 95% Confidence Interval; VAIN 2/3: Vaginal intraepithelial neoplasia of grade 2/3;
Data sources:
Based on systematic reviews (up to 2008) performed by ICO for the IARC Monograph on the Evaluation of Carcinogenic Risks to Humans volume 100B and IARC's Infections and Cancer Epidemiology Group. The ICO HPV Information Centre has updated data until June 2014. Reference publications: 1) Bouvard V, Lancet Oncol 2009;10:321 2) De Vuyst H, Int J Cancer 2009;124:1626

Figure 35: Ten most frequent HPV types among cases of vaginal cancer in Africa compared to the World



*No data available. No more types than shown were tested or were positive. **Data updated at 20 mar. 2015 (data as of 30 jun. 2014).**
[a] Includes cases from Mozambique, Nigeria.
[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 36: Ten most frequent HPV types among VaIN 2/3 cases in Africa compared to the World



*No data available. No more types than shown were tested or were positive. **Data updated at 20 mar. 2015 (data as of 30 jun. 2014).**
VAIN 2/3: Vaginal intraepithelial neoplasia of grade 2/3;
[a] 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 50% of all penile cancers *((de Martel C et al. Lancet Oncol 2012;13(6):607-15)*. 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 keratinizing (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 keratinizing and verrucous tumours. In this section, the HPV burden among cases of penile cancers in Malawi is presented.

Table 24: Studies on HPV prevalence among penile cancer cases in Malawi

Study	HPV detection method and targeted HPV types	No. Tested	HPV prevalence		Prevalence of 5 most frequent HPVs HPV type (%)
			%	(95% CI)	
No Data Available	-	-	-	-	-

Data updated at 15 dic. 2014 (data as of 30 jun. 2014).
95% CI: 95% Confidence Interval;
Data sources:
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 25: Studies on HPV prevalence among PeIN 2/3 cases in Malawi

Study	HPV detection method and targeted HPV types	No. Tested	HPV prevalence		Prevalence of 5 most frequent HPVs HPV type (%)
			%	(95% CI)	
No Data Available	-	-	-	-	-

Data updated at 15 dic. 2014 (data as of 30 jun. 2014).
95% CI: 95% Confidence Interval; PeIN 2/3: Penile intraepithelial neoplasia of grade 2/3;
Data sources:
The ICO HPV Information Centre has updated data until June 2014. Reference publication (up to 2008): Bouvard V, Lancet Oncol 2009;10:321

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 subgroups 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 penile and external genital HPV in men is higher than cervical HPV in women, but persistence is less likely. As with genital HPV prevalence, high numbers of sexual partners increase acquisition of oncogenic HPV infections (Vaccine 2012, Vol. 30, Suppl 5). In this section, the HPV burden among men in Malawi is presented.

Brief methods: Prevalence of human papillomavirus in men: based on systematic reviews and meta-analyses

The HPV-prevalence for 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, and Hebnes JB, J Sex Med 2014; 11: 2630) up to September 15, 2014. Search terms 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, a minimum of 20 cases for men 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 globally and by geographical region. Binomial 95% confidence intervals were calculated for each HPV prevalence.

Table 26: Studies on HPV prevalence among men in Malawi

Study	Anatomic sites samples	HPV detection method	Population	Age (years)	HPV prevalence		
					No	%	(95% CI)
No Data Available	-	-	-	-	-	-	-

Data updated at 15 dic. 2014 (data as of 15 sep. 2014).
95% CI: 95% Confidence Interval;
Data sources:
Based on published systematic reviews, the ICO HPV Information Centre has updated data until September 2014. 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 27: Studies on HPV prevalence among men from special subgroups in Malawi

Study	Anatomic sites samples	HPV detection method	Population	Age (years)	HPV prevalence		
					No	%	(95% CI)
No Data Available	-	-	-	-	-	-	-

Data updated at 15 dic. 2014 (data as of 15 sep. 2014).
95% CI: 95% Confidence Interval;
Data sources:
Based on published systematic reviews, the ICO HPV Information Centre has updated data until September 2014. 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 head and neck

The last evaluation of the International Agency for Research in Cancer (IARC) on the carcinogenicity of Human Papillomavirus (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. The most recent figures estimate that 25.6% of all oropharyngeal cancers are attributable to HPV infection with HPV16 being the most frequent type *(de Martel C. Lancet Oncol. 2012;13(6):607)*.

4.4.1 Burden of oral HPV infection in healthy population

Table 28: Studies on oral HPV prevalence among healthy in Malawi

Study	Method specimen collection and anatomic site	HPV detection method and targeted HPV types	Population	Age (years)	No. Tested	HPV prevalence %	HPV prevalence (95% CI)	Prev. of 5 most frequent HPVs HPV type (%)
MEN								
No Data Available	-	-	-	-	-	-	-	-
WOMEN								
No Data Available	-	-	-	-	-	-	-	-
BOTH OR UNSPECIFIED								
No Data Available	-	-	-	-	-	-	-	-

Data updated at 19 dic. 2015 (data as of 29 feb. 2012). Only for European countries.
95% CI: 95% Confidence Interval;
Data sources:
Systematic review and meta-analysis was performed by ICO HPV Information Centre until July 2012. Pubmed was searched using the keywords oral and papillomavirus. Inclusion criteria: studies reporting oral HPV prevalence in healthy population in Europe; n > 50. Exclusion criteria: focused only in children or immunosuppressed population; not written in English; case-control studies; commentaries and systematic reviews and studies that did not use HPV DNA detection methods.

4.4.2 HPV burden in head and neck cancers

Table 29: Studies on HPV prevalence among cases of oral cavity cancer in Malawi

Study	HPV detection method and targeted HPV types	No. Tested	HPV prevalence %	HPV prevalence (95% CI)	Prevalence of 5 most frequent HPVs HPV type (%)
MEN					
No Data Available	-	-	-	-	-
WOMEN					
No Data Available	-	-	-	-	-
BOTH OR UNSPECIFIED					
No Data Available	-	-	-	-	-

Data updated at 19 dic. 2015 (data as of 29 feb. 2012).
95% CI: 95% Confidence Interval;
Data sources:
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 30: Studies on HPV prevalence among cases of oropharyngeal cancer in Malawi

Study	HPV detection method and targeted HPV types	No. Tested	HPV prevalence %	HPV prevalence (95% CI)	Prevalence of 5 most frequent HPVs HPV type (%)
MEN					
No Data Available	-	-	-	-	-
WOMEN					
No Data Available	-	-	-	-	-
BOTH OR UNSPECIFIED					
No Data Available	-	-	-	-	-

Data updated at 19 dic. 2015 (data as of 29 feb. 2012).
95% CI: 95% Confidence Interval;
Data sources:
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 31: Studies on HPV prevalence among cases of hypopharyngeal or laryngeal cancer in Malawi

Study	HPV detection method and targeted HPV types	No. Tested	HPV prevalence %	HPV prevalence (95% CI)	Prevalence of 5 most frequent HPVs HPV type (%)
MEN					
No Data Available	-	-	-	-	-
WOMEN					
No Data Available	-	-	-	-	-
BOTH OR UNSPECIFIED					
No Data Available	-	-	-	-	-

Data updated at 19 dic. 2015 (data as of 29 feb. 2012).
95% CI: 95% Confidence Interval;
Data sources:
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 Malawi are presented.

Table 32: Factors contributing to cervical carcinogenesis (cofactors) in Malawi

INDICATOR		MALE	FEMALE	TOTAL
Smoking				
Smoking of any tobacco adjusted prevalence (%)	Current[1,a,b,±]	26.3	6.4	16.3
	Daily[1,a,c,±]	20.1	3.8	11.9
Cigarette smoking adjusted prevalence (%)	Current[1,a,b,±]	22.4	1.2	11.7
	Daily[1,a,c,±]	18.1	1.2	9.7
Parity				
Total fertility rate per woman[2,d,a]		-	5.71	-
Age-specific fertility rate (per 1000 women)	15-19 yrs[2,d,a]	-	152	-
	20-24 yrs[2,d,a]	-	269	-
	25-29 yrs[2,d,a]	-	238	-
	30-34 yrs[2,d,a]	-	206	-
	35-39 yrs[2,d,a]	-	162	-
	40-44 yrs[2,d,a]	-	82	-
	45-49 yrs[2,d,a]	-	33	-
Hormonal contraception				
Oral contraceptive use (%) among women15-49yrs who are married or in union[3,4]		-	2.5	-
Hormonal contraception use (%) (pill, injectable or implant), among women15-49yrs who are married or in union[3,4]		-	29.6	-
HIV				
Estimated percent of adults aged 15-49 who are living with HIV [low estimate - high estimate][5,e]		-	-	10.0 [9.3 - 10.8]
Estimated percent of young adults aged 15-24 who are living with HIV [low estimate - high estimate][5,e]		2.4 [1.9 - 3.2]	4.1 [3.5 - 4.9]	-
HIV prevalence (%) among female sex workers in the capital city[5,f]		-	24.9	-
HIV prevalence (%) among men who have sex with men in the capital city[5]		17.3	-	-
Estimated number of adults (15+ yrs) living with HIV [low estimate - high estimate][5,g]		-	560 000 [510 000 - 600 000]	930 000 [860 000 - 990 000]
Estimated number of adults and children living with HIV [low estimate - high estimate][5,g]		-	-	1 100 000 [990 000 - 1 100 000]
Estimated number of AIDS deaths in adults and children [low estimate - high estimate][5,h]		-	-	33 000 [27 000 - 41 000]

Data accessed between 21 jul. 2015 to 08 sep. 2015.

[a] Adjusted and age-standardized prevalence estimates of tobacco use by country, for the year 2013. These rates are constructed solely for the purpose of comparing tobacco use prevalence estimates across countries, and should not be used to estimate the number of smokers in the population.

[b] "Current" means smoking at the time of the survey, including daily and non-daily smoking. "Tobacco smoking" means smoking any form of tobacco, including cigarettes, cigars, pipes, hookah, shisha, water-pipe, etc. and excluding smokeless tobacco.

[c] "Daily" means smoking every day at the time of the survey. "Tobacco smoking" means smoking any form of tobacco, including cigarettes, cigars, pipes, hookah, shisha, water-pipe, etc. and excluding smokeless tobacco.

[d] Fertility rate estimates by country are presented as a proxy measure of parity. Parity is the number of times a woman has given birth, while fertility rate is the average number of live births per woman, assuming the age-specific fertility rate observed in a given year or period. Age-specific fertility rates read as the annual number of births per 1000 women in the corresponding age group.

[e] Estimates include all people with HIV infection, regardless of whether they have developed symptoms of AIDS.

[f] Data on key populations at higher risk from country progress reports typically derive from surveys in capital cities and are not representative of the entire country. In particular, surveys in capital cities are likely to overestimate national HIV prevalence and service coverage.

[g] The number of people with HIV infection, whether or not they have developed symptoms of AIDS, estimated to be alive at the end of a specific year.

[h] The estimated number of adults and children that have died due to HIV/AIDS in a specific year.

Year of estimation: [±] 2008;

[a] Please refer to original sources (available at: http://www.un.org/esa/population/publications/worldfertility2009/worldfertility2009.htm and http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&langua
)

Data sources:

(Continued on next page)

(Table 32 – continued from previous page)

[1]WHO report on the global tobacco epidemic, 2015: The MPOWER package. Geneva, World Health Organization, 2015. Available at http://www.who.int/tobacco/global_report/2015/en/index.html

[2]United Nations, Department of Economic and Social Affairs, Population Division (2013). World Fertility Data 2012 (POP/DB/Fert/Rev2012). Available at: http://www.un.org/esa/population/publications/WFD2012/MainFrame.html

[3]United Nations, Department of Economic and Social Affairs, Population Division (2014). World Contraceptive Use 2014 (POP/DB/CP/Rev2014). Available at http://www.un.org/en/development/desa/population/publications/dataset/contraception/wcu2014.shtml

[4]Demographic and Health Survey (DHS).

[5]2015 UNAIDS database [internet]. Available at: http://aidsinfo.unaids.org/ [Accessed on September 2015]

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.

Table 33: Percentage of 15-year-olds who have had sexual intercourse in Malawi

Indicator	Male	Female
Percentage of 15-year-old subjects who report sexual intercourse	14	15

Data accessed at 08 ago. 2013.

Please refer to original source (available at: www.euro.who.int/en/what-we-do/health-topics/Life-stages/child-and-adolescent-health/publications2/2011/inequalities-in-young-peoples-health.-hbsc-international-report-from-the-20052006-survey)

Data sources:

Currie C, Nic Gabhainn S, Godeau E, Roberts C, Smith R, Currie D, Pickett W, Richter M, Morgan A and Barnekow V (eds.) (2008) Inequalities in young people's health: HBSC international report from the 2005/06 Survey. Health Policy for Children and Adolescents, No. 5, WHO Regional Office for Europe, Copenhagen, Denmark.

Table 34: Median age at first sex in Malawi

			MALE		FEMALE		TOTAL	
Study[1]	Year/period	Birth cohort	N	Median age at first sex	N	Median age at first sex	N	Median age at first sex
Malawi DHS 2010	2010	1956-1985	4,146	18.7	-	-	-	-
	2010	1986-1990	1,078	18.0	4,277	17.4	-	-
	2010	1986-1995	2,028	-	6,481	-	-	-
	2010	1961-1990	-	-	-	17.1	-	-
	2010	1976-1980	941	18.6	3,244	17.3	-	-
	2010	1956-1990	5,226	18.6	-	-	-	-
	2010	1961-1985	3,793	18.7	13,421	17.2	-	-
	2010	1961-1985	-	-	-	17.6	-	-
	2010	1966-1970	528	18.8	1,730	17.0	-	-
	2010	1961-1990	-	-	-	17.8	-	-
	2010	1961-1990	4,867	18.5	17,691	17.3	-	-
	2010	1991-1995	951	-	2,202	-	-	-
	2010	1971-1975	792	18.7	2,517	17.2	-	-
	2010	1981-1985	1,074	18.5	4,369	17.3	-	-
	2010	1961-1965	456	19.0	1,558	17.0	-	-
	2010	1961-1985	-	-	-	17.1	-	-

Data accessed at 03 jun. 2015.

N: number of subjects;

[a] Data omitted because less than 50 percent of respondents had intercourse for the first time before reaching the beginning of the age group.

[b] Rural.

[c] Urban.

Data sources:

[1] National Statistical Office (NSO) and ICF Macro. 2011. Malawi Demographic and Health Survey 2010. Zomba, Malawi, and Calverton, Maryland, USA: NSO and ICF Macro.

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, introduction in Malawi.

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 ('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 35: Main characteristics of cervical cancer screening in Malawi

Availability of a cervical cancer screening programme[α]	Yes
Quality assurance structure and mandate to supervise and to monitor the screening process[β]	No
Active invitation to screening[γ]	No
Main screening test used for primary screening	VIA
Undergoing demonstration projects	
Screening ages (years)	30-50
Screening interval or frequency of screenings	3-5 years

Data accessed at 15 oct. 2015.

[α] Public national cervical cancer screening program in place (Cytology/VIA/HPV testing). Countries may have clinical guidelines or protocols, and cervical cancer screening services in a private sector but without a public national program. Publicly mandated programmes have a law, official regulation, decision, directive or recommendation that provides the public mandate to implement the programme with an authorised screening test, examination interval, target group and funding and co-payment determined.

[β] Self-reported quality assurance: Organised programmes provide for a national or regional team responsible for implementation and require providers to follow guidelines, rules, or standard operating procedures. They also define a quality assurance structure and mandate supervision and monitoring of the screening process. To evaluate impact, organised programmes also require ascertainment of the population disease burden. Quality assurance consists of the management and coordination of the programme throughout all levels of the screening process (invitation, testing, diagnosis and follow-up of screen-positives) to assure that the programme performs adequately and provides services that are effective and in-line with programme standards. The quality assurance structure is self-reported as part of the national cancer programs or plans.

[γ] Self-reported active invitation or recruitment, as organised population-based programmes, identify and personally invite each eligible person in the target population to attend a given round of screening.

Data sources:

WHO. Prevention of cervical cancer through screening using visual inspection with acetic acid (VIA) and treatment with cryotherapy. A demonstration project in six African countries: Malawi, Madagascar, Nigeria, Uganda, the United Republic of Tanzania, and Zambia. 2012. Available at: http://apps.who.int/iris/bitstream/10665/75250/1/9789241503860_eng.pdf

Cervical Cancer Action: a global Coalition to stop Cervical Cancer (CCa). Progress In Cervical Cancer Prevention: The CCA Report card. Update August 2015 [Accessed on August 18, 2015], available at http://www.cervicalcanceraction.org/pubs/pubs.php. The information represented there has been collected through interviews with individuals and organizations involved with the countries represented and has not been verified with individual Ministries of Health. Any versights or inaccuracies are unintentional.

Table 36: Estimated coverage of cervical cancer screening in Malawi

Reference[1]	Year	Population	Urban vs rural or both (all)	N Women	Age range	Within the last year(s)	Coverage (%)[a]
WHS 2003 Malawi	2002-2003	General female population	Rural	2,330	18-69	3y	2 .5
	2002-2003	General female population	Urban	383	18-69	3y	3 .7
	2002-2003	General female population	All	2,713	18-69	3y	2 .6
	2002-2003	General female population	All	1,735	25-64	3y	2 .6

Data accessed at 27 nov. 2015.

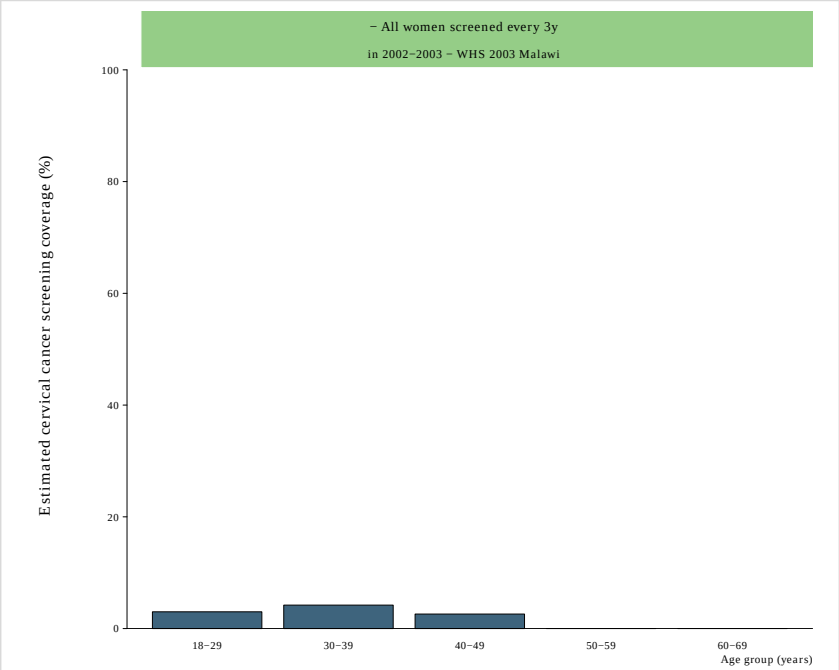
WHO Household Surveys with geographical information system (GIS) multistage cluster sampling. Screening coverage among women aged 18-69.

[a] Proportion of women in the total sample of the mentioned age range in the country or region that reported having a Pap smear during a given time period (e.g., last year, last 2, 3, 5 years or ever).

Data sources:

[1] World Health Organization (WHO). Malawi-World Health Survey 2003 (MWI_2003_WHS_v01_M). Available at: http://apps.who.int/healthinfo/systems/surveydata/index.php/catalog/85 [Accessed by October 2015]

Figure 37: Estimated coverage of cervical cancer screening in Malawi , by age and study



Data accessed at 27 nov. 2015.

WHO Household Surveys with geographical information system (GIS) multistage cluster sampling. Screening coverage among women aged 18-69.

[a] Proportion of women in the total sample of the mentioned age range in the country or region that reported having a Pap smear during a given time period (e.g., last year, last 2, 3, 5 years or ever).

Data sources:

ICO Information Centre on HPV and Cancer. Country-specific references identified in each country-specific report as general recommendation from relevant scientific organizations and/or publications. [1] World Health Organization (WHO). Malawi-World Health Survey 2003 (MWI_2003_WHS_v01_M). Available at: http://apps.who.int/healthinfo/systems/surveydata/index.php/catalog/85 [Accessed by October 2015]

7.2 HPV vaccination

Table 37: HPV vaccine introduction in Malawi

Indicator	Value
HPV vaccine introduction, schedule and delivery	
HPV vaccination program[1]	Pilot program
Date of the HPV vaccination routine immunization programme start[2]	2013
HPV vaccination target age for routine immunization[2]	9-13
Comments	-
HPV vaccination coverage	
Full course HPV vaccination coverage for routine immunization: % (calendar year)	-

Data accessed at 15 nov. 2015.

Data sources:

Cervical Cancer Action: a global Coalition to stop Cervical Cancer (CCa). Progress In Cervical Cancer Prevention: The CCA Report card. Update August 2015, available at http://www.cervicalcanceraction.org/pubs/pubs.php.

Annual WHO/UNICEF Joint Reporting Form (Update of 2015/July/15). Geneva, Immunization, Vaccines and Biologicals (IVB), World Health Organization. Available at: http://www.who.int/immunization/monitoring_surveillance/en/

Markowitz LE, Tsu V, Deeks SL, Cubie H, Wang SA, Vicari AS, Brotherton JM. Human papillomavirus vaccine introduction–the first five years. Vaccine. 2012 Nov 20;30 Suppl 5:F139-48.

[1]Cervical Cancer Action, June 2013 [accessed on July 15th 2013], available at http://www.cervicalcanceraction.org/comments/comments3.php. The information represented here has been collected through interviews with individuals and organizations involved with the countries represented and has not been verified with individual Ministries of Health. Any versights or inaccuracies are unintentional.

[2]WHO vaccine-preventable diseases: monitoring system. 2013 global summary. Available at: http://apps.who.int/immunization_monitoring/globalsummary/schedules. Last updated 20-Octl-2013 (data as of 16-Oct-2013); next overall update June 2014.

8 Protective factors for cervical cancer

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

Table 38: Prevalence of male circumcision in Malawi

Reference	Prevalence % (95% CI)	Methods
2010 DHS	21.6	Data from 2010 Demographic and Health Surveys (DHS)
Drain 2006	<20	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%.
WHO 2007	<20	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%.
Williams 2006	17	Data from Demographic and Health Surveys (DHS) and other publications.

Data accessed at 31 ago. 2015.
95% CI: 95% Confidence Interval;
Please refer to country-specific reference(s) for full methodologies.
Data sources:
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.
2010 Demographic and Health Surveys (DHS) | Drain PK, BMC Infect Dis 2006; 6: 172 | WHO 2007: Male circumcision: Global trends and determinants of prevalence, safety and acceptability | Williams BG, PLoS Med 2006; 3: e262

Table 39: Prevalence of condom use in Malawi

Indicator	Year of estimation	Prevalence %
Condom use	2010	2.4

Data accessed at 21 jul. 2015.
Data sources:
United Nations, Department of Economic and Social Affairs, Population Division (2014). World Contraceptive Use 2014 (POP/DB/CP/Rev2014). Available at http://www.un.org/en/development/desa/population/publications/dataset/contraception/wcu2014.shtml
Demographic and Health Survey (DHS).

9 Indicators related to immunization practices other than HPV vaccines

This section presents data on immunization coverage and practices for selected vaccines. This information will be relevant for assessing the country's capacity to introduce and implement the new HPV vaccines. The data are periodically updated and posted on the WHO Immunization surveillance, assessment and monitoring website (http://who.int/immunization_monitoring/en/).

9.1 Immunization schedule

Table 40: General immunization schedule in Malawi

Vaccine	Schedule	Coverage	Comment
Bacille Calmette-Guirin vaccine	birth,	entire	-
Diphtheria and Tetanus and pertussis and Haemophilus influenzae and Hepatitis B	6, 10, 14 weeks,	entire	-
Human Papillomavirus vaccine	1st contact, +2, +4 months,	part	girls aged 9-13 years
Measles vaccine	9 months,	entire	-
Oral polio vaccine	6, 10, 14 weeks,	entire	-
Pneumococcal conjugate vaccine	6, 10, 14 weeks,	entire	-
Rotavirus vaccine	6, 10 weeks,	entire	-
Tetanus toxoid	1st contact, +1, +6 months, +1, +1 year,	entire	pregnant women and CBAW
Vitamin A supplementation	6, 12, 18, 24, 30, 36 months,	entire	and postpartum

Data accessed at 21 jul. 2015.
The shedules are the country official reported figures. The shedules are the country official reported figures
Data sources:
Annual WHO/UNICEF Joint Reporting Form (Update of 2015/July/15). Geneva, Immunization, Vaccines and Biologicals (IVB), World Health Organization. Available at: http://www.who.int/immunization/monitoring_surveillance/en/

9.2 Immunization coverage estimates

Table 41: Immunization coverage estimates in Malawi

Indicator	Year of estimation	Coverage (%)
Third dose of diphtheria toxoid, tetanus toxoid and pertussis vaccine	2014	91
Third dose of hepatitis B vaccine administered to infants	2014	91
Third dose of Haemophilus influenzae type B vaccine	2014	91
Measles-containing vaccine	2014	85
Third dose of polio vaccine	2014	87

Data accessed at 21 jul. 2015.
The coverage figures (%) are the country official reported figures. Immunization coverage levels are presented as a percentage of a target population that has been vaccinated.
Data sources:
Annual WHO/UNICEF Joint Reporting Form and WHO Regional offices reports (Update of 2013/July/13). Geneva, Immunization, Vaccines and Biologicals (IVB),World Health Organization (http://www.who.int/immunization_monitoring/data/data_subject/en/index.html)

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(http://cordis.europa.eu/projects/rcn/94423_en.html)

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(http://cordis.europa.eu/project/rcn/100268_en.html)

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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