



Human Papillomavirus and Related Cancers

Summary Report Update. September 15, 2010.

BOLIVIA



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Preface

Preface to the third edition

Since the first edition of the HPV Information Centre, GLOBOCAN, one of the landmark products of the International Agency for Research on Cancer (IARC), serves as the reference source of cancer statistics. GLOBOCAN is a resource that provides on a regular basis the most accurate assessment of global cancer burden in the world. On June 1st 2010, the new edition of GLOBOCAN, GLOBOCAN 2008, was launched and new cancer estimates for 2008 are currently available.

This third edition of the HPV Information Centre incorporates the new burden estimates for all HPV-related cancers. In addition to the publicly available GLOBOCAN 2008, IARC has kindly provided the HPV Information Centre with age-specific estimates for HPV-related cancers which are also presented in this report.

Preface to the second edition

The available data on the epidemiology and prevention of HPV infection and HPV-related cancers at the country-specific level has grown substantially since the first edition of the HPV Information Centre in 2007.

This second edition reflects the continuous efforts to update our previous data and to expand the information to include new statistics. Thus, the user of the website (www.who.int/hpvcentre) will be able to find and manage new indicators on the burden of other HPV-related cancers (such as that of the vulva, vagina, anus, penis, oral cavity and pharynx), HPV in anogenital cancers, HPV in men, sexual and reproductive behaviour practices, HPV preventive strategies of cervical screening, HPV vaccine licensure and introduction, and male circumcision.

The HPV Information Centre team hopes that this update will be a useful resource to help formulate recommendations and public health interventions towards the prevention of cervical cancer and HPV-related diseases in each country.

Preface to the first edition

The main aim of this report is to summarize the information available on human papillomavirus (HPV) and cervical cancer at the country-specific level. The World Health Organization (WHO) in collaboration with the Institut Català d'Oncologia (ICO) have developed the WHO/ICO Information Centre on HPV and Cervical Cancer (HPV Information Centre) to evaluate the burden of disease in the country and to help facilitate stakeholders and relevant bodies of decision makers to formulate recommendations on cervical cancer prevention, including the implementation of the newly developed HPV vaccines.

Data aggregated are derived from data and official reports produced by the World Health Organization (WHO), International Agency for Research on Cancer (IARC), United Nations, The World Bank, and published literature. Indicators include relevant statistics on cancer, epidemiological determinants of cervical cancer such as demographics, socioeconomic factors and other risk factors, estimates on the burden of HPV infection, data on immunization and cervical cancer screening. These statistics are essential when planning and implementing cervical cancer prevention strategies. Therefore, we have integrated the most important information for each country into a report and on a website (www.who.int/hpvcentre) to provide a user-friendly tool to assess the best available information in each country.

The information presented here is intended as a resource for all who are working towards the prevention of cervical cancer.

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 Bolivia 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.

Bolivia has a population of 2.89 millions women ages 15 years and older who are at risk of developing cervical cancer. Current estimates indicate that every year 1422 women are diagnosed with cervical cancer and 638 die from the disease. Cervical cancer ranks as the 1st most frequent cancer among women in Bolivia, and the 1st most frequent cancer among women between 15 and 44 years of age. Data is not yet available on the HPV burden in the general population of Bolivia. However, in South America, the region Bolivia belongs to, about 13.2% of women in the general population are estimated to harbour cervical HPV infection at a given time.

Table 1: Key Statistics on Bolivia

Population		
Women at risk for cervical cancer (Female population aged >=15 yrs)		2.89 millions
Burden of cervical cancer and other HPV-related cancers		
Annual number of cervical cancer cases		1422
Annual number of cervical cancer deaths		638
Projected number of new cervical cancer cases in 2025*		2209
Projected number of cervical cancer deaths in 2025*		1022
Crude incidence rates per 100,000 population and year:		
	Male	Female
Cervical cancer	-	29.3
Anal cancer	-	-
Vulva cancer	-	-
Vaginal cancer	-	-
Penile cancer	-	-
Oral cavity	1.1	0.9
Pharynx (excluding nasopharynx)	0.3	0.2
Burden of cervical HPV infection		
HPV prevalence (%) in the general population (among women with normal cytology)		-
Prevalence (%) of HPV 16 and/or HPV 18 among women with:		
	Normal cytology	-
	Low-grade cervical lesions (LSIL/CIN-1)	-
	High-grade cervical lesions (HSIL/ CIN-2 / CIN-3 / CIS)	-
	Cervical cancer	38.3
Other factors contributing to cervical cancer		
Smoking prevalence (%), women		-
Total fertility rate (live births per women)		4.1
Oral contraceptive use (%)		3.6
HIV prevalence (%), adults (15-49 years)		0.2
Sexual behaviour		
Median age at first sexual intercourse among men (25-54 years) / women (25-49 years)		17.3 / 18.6
% of young men/women (15-24 years) who had sex before the age of 15		18 / 6
Cervical screening practices and recommendations		
Cervical cancer screening coverage, % (age and screening interval, reference)	28.0% (All women aged 15-49 yrs ever screened; ENDSA 2003)	
	32.2% (Urban women aged 15-49 yrs ever screened; ENDSA 2003)	
	18.7% (Rural women aged 15-49 yrs ever screened; ENDSA 2003)	
	9.0% (All women aged 25-49 yrs screened every 3yrs; Batista Moliner 2006)	
Screening ages (years)		-
Screening interval (years) or frequency of screens		-
HPV vaccine		
HPV vaccine licensure		
	Bivalent Vaccine (Cervarix)	-
	Quadrivalent Vaccine (Gardasil/Silgard)	Yes
HPV vaccine introduction		
	HPV vaccine schedule	-
	Introduction in entire or part of the country	-
	Comment:	-
HPV vaccine recommendation		
	Recommendation for primary target population:	-
	Recommendation for "catch-up" population:	-
	Recommendation for vaccinating males:	-

*Projected burden in 2025 is estimated by applying current population forecasts for the country and assuming that current incidence/mortality rates of cervical cancer are constant over time.

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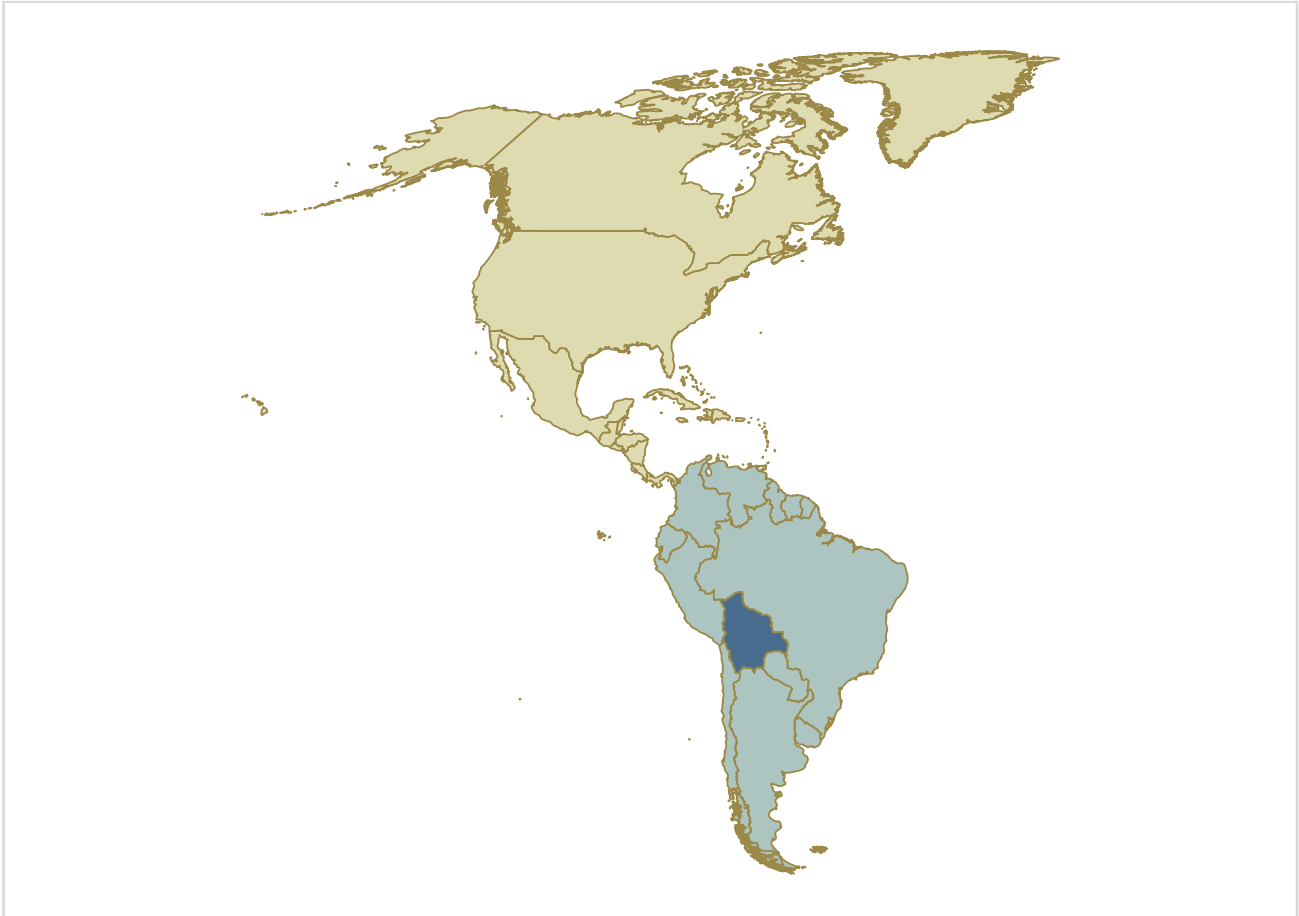
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1 Introduction

Figure 1: Bolivia in South America



The WHO/ICO Information Centre on HPV and Cervical 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 Bolivia 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 summarizes the socio-demographic profile of the country. For analytical purposes, Bolivia is classified in the geographical region of South America (Figure 1, lighter blue), which is composed of the following countries:* Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Guyana, Paraguay, Peru, Suriname, Uruguay and Venezuela (Bolivarian Republic of). Throughout the report, Bolivia estimates will be complemented with corresponding estimates in the South America region to provide the regional situation. When data are not available for Bolivia only regional estimates are shown.

Section 3 describes the current burden of invasive cervical cancer and other HPV-related cancers in Bolivia and the South America region with estimates of prevalence, incidence and mortality rates.

Section 4 reports on the prevalence of HPV and HPV type-specific distribution in women with normal cytology, pre-cancerous lesions and invasive cervical cancer. In addition, the burden of HPV in other

*See <http://unstats.un.org/unsd/methods/m49/m49regin.htm> for more information.

anogenital cancers (anal, vulva, vagina and penis) and men are presented.

Section 5 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.

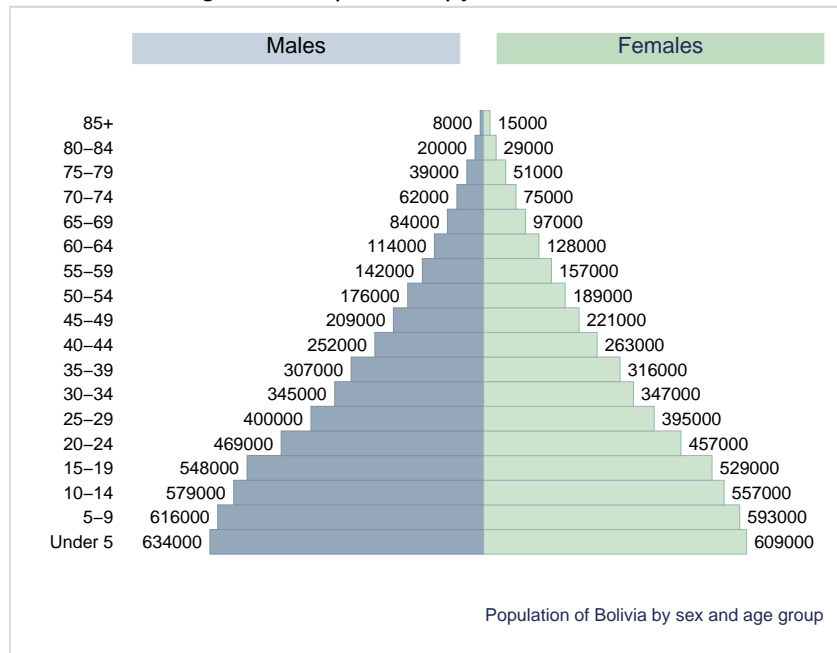
Section 6 describes sexual and reproductive health behaviour indicators that may be used as proxy measures of risk for HPV infection and anogenital cancers.

Section 7 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 and the prevalence of male circumcision and condom use.

Section 8 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 Bolivia

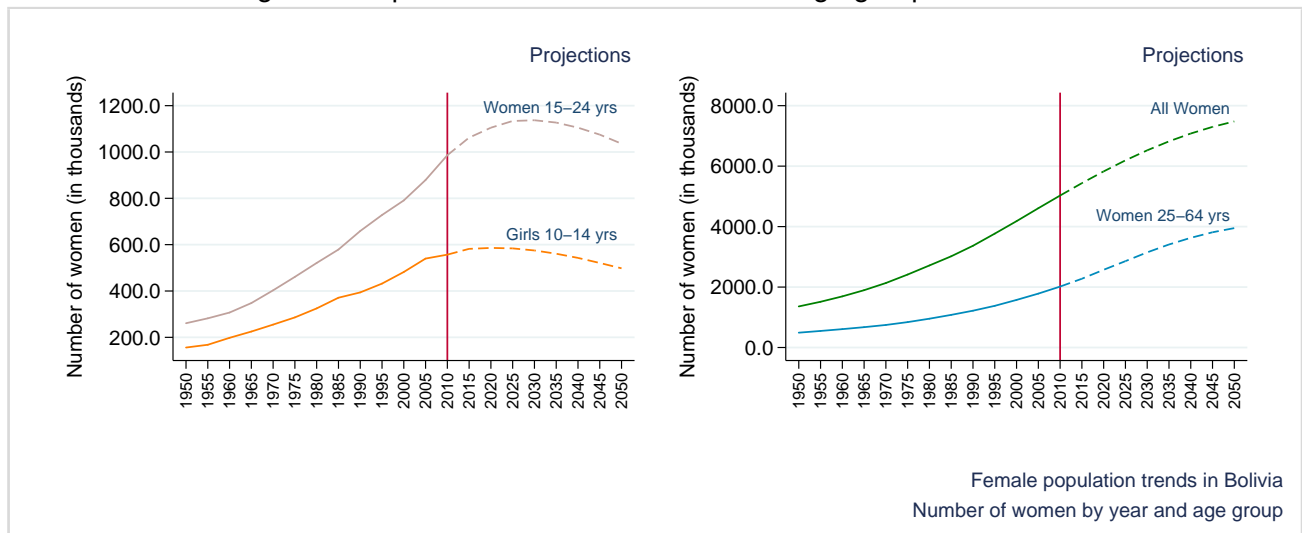


Datapoint year 2010.

Data sources:

World population prospects: the 2008 revision. New York, Population Division, Department of Economic and Social Affairs, United Nations Secretariat, 2009.

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



Population in thousands. Data sources:

World population prospects: the 2008 revision. New York, Population Division, Department of Economic and Social Affairs, United Nations Secretariat, 2009.

Table 2: Sociodemographic indicators in Bolivia

Indicator	Male	Female	Total
Population in 1000s ¹	4575 ^a	4607 ^a	9182 ^a
Population growth rate (%) ¹	-	-	1.77 ^b
Median age (years) ¹	-	-	20.8 ^a
Population living in urban areas (%) ²	-	-	65 ^c
Crude birth rate (births per 1000 population) ¹	-	-	27.3 ^b
Crude death rate (deaths per 1000 population) ¹	-	-	7.6 ^b
Life expectancy at birth (years): ³	64 ^c	67 ^c	66 ^c
Adult mortality rate: ³	242 ^c	176 ^c	208 ^c
Infant mortality rate (per 1000 live births): ³	52 ^c	47 ^c	50 ^c
Maternal mortality ratio (per 100,000 live births) ⁴	-	-	290 ^a
Neonatal mortality rate (per 1000 live births) ⁵	-	-	24 ^d
Under 5 mortality rate (per 1000 live births): ³	62 ^c	60 ^c	61 ^c
Gross national income per capita (PPP int \$) ⁶	-	-	2890 ^c
Population living <\$1 a day (%: PPP int \$) ⁷	-	-	23.2 ^e
General government expenditure on health as % of total government expenditure ⁸	-	-	12.4 ^a
General government expenditure on health as % of total expenditure on health ⁸	-	-	61.6 ^a
Total expenditure on health as % of gross domestic product ⁸	-	-	6.9 ^a
Per capita total expenditure on health at average exchange rate (US\$) ⁸	-	-	71.0 ^a
Per capita government expenditure on health at average exchange rate (US\$) ⁸	-	-	44.0 ^a
Private expenditure on health as % of total expenditure on health ⁸	-	-	38.4 ^a
Density of physicians (per 10,000 population) ⁹	-	-	12 ^e
Number of physicians ⁹	-	-	10329 ^e
Adult (15 years and over) literacy rate (%) ¹⁰	-	-	86.7 ^f
Youth (15-24 years) literacy rate (%): ¹⁰	99.0 ^g	97.9 ^g	98.5 ^g
Net primary school enrollment ratio: ¹⁰	94 ^e	96 ^e	-
Net secondary school enrollment ratio: ¹⁰	71.7 ^e	70.0 ^e	-

Year of estimation: ^a 2005; ^b 2005-2010; ^c 2006; ^d 2004; ^e 2000-2006; ^f 2000-2005; ^g 2007;

Data notes and sources:

¹ World population prospects: the 2008 revision. New York, Population Division, Department of Economic and Social Affairs, United Nations Secretariat, 2009.

² World population prospects: the 2006 revision. New York, Population Division, Department of Economic and Social Affairs, United Nations Secretariat, 2007.

³ Life tables for WHO Member States. Geneva, World Health Organization, 2006 (http://www.who.int/whosis/database/life_tables/life_tables.cfm, accessed 18 March 2008).

⁴ Maternal mortality in 2005: estimates developed by WHO, UNICEF, UNFPA and the World Bank. Geneva, World Health Organization, 2007 (http://www.who.int/reproductive-health/publications/maternal_mortality_2005/mme_2005.pdf, accessed 18 March 2008).

⁵ Neonatal and perinatal mortality: country, regional and global estimates 2004. Geneva, World Health Organization, 2007. (http://whqlibdoc.who.int/publications/2007/9789241596145_eng.pdf, accessed 18 March 2008).

⁶ PPP int. \$, purchasing power parity at international dollar rate.

⁷ GNI per capita 2007, atlas method and PPP. Washington, DC, World Bank, 2007.

⁸ PPP int. \$, purchasing power parity at international dollar rate.

World development indicators 2007. Washington, DC, International Bank for Reconstruction World Bank, 2007.

⁹ National health accounts: country information. Geneva, World Health Organization, 2007 (<http://www.who.int/nha/country/en/index.html>, accessed 17 March 2008).

¹⁰ Global atlas of the health workforce [online database]. Geneva, World Health Organization, 2008 (http://www.who.int/globalatlas/autologin/hrh_login.asp, accessed 17 March 2008).

¹⁰ UNESCO Institute for Statistics Data Centre [online database]. Montreal, UNESCO Institute for Statistics, 2007 (<http://stats.uis.unesco.org>, accessed 16 March 2008).

3 Burden of HPV related cancers

3.1 Cervical cancer

Cancer of the cervix uteri is the second most common cancer among women worldwide, with an estimated 529,409 new cases and 274,883 deaths in 2008. About 86% of the cases occur in developing countries, representing 13% of female cancers. Worldwide, mortality rates of cervical cancer are substantially lower than incidence with a ratio of mortality to incidence to 52% (*IARC, GLOBOCAN 2008*). The majority of cases are squamous cell carcinoma and adenocarcinomas are less common. (*Vaccine 2006, Vol. 24, Supl 3; Vaccine 2008, Vol. 26, Supl 10; IARC Monographs 2007, Vol. 90*)

This section describes the current burden of invasive cervical cancer in Bolivia and the South America region with estimates of annual number of new cases, deaths, and incidence and mortality rates.

3.1.1 Incidence

Table 3: Incidence of cervical cancer in Bolivia, South America and the World

Indicator	Bolivia	South America	World
Crude incidence rate ¹	29.3	24.6	15.8
Age-standardized incidence rate ¹	36.4	24.1	15.3
Cumulative risk (%). Ages 0-74 years ¹	3.7	2.5	1.6
Annual number of new cancer cases	1422	47881	529828

Standardized rates have been estimated using the direct method and the World population as the reference.

¹ Rates per 100,000 women per year.

Data sources:

IARC, Globocan 2008. (Specific methodology for Bolivia: Simple average of the incidence rates from: 1) Simple average of the estimated incidence rates for Ecuador and Peru 2) Incidence rates from La Paz (1999). For further details refer to http://globocan.iarc.fr/DataSource_and_methods.asp and <http://globocan.iarc.fr/method/method.asp?country=068>.)

Table 4: Incidence of cervical cancer in Bolivia by cancer registry

Cancer registry	Period	N cases ¹	Crude rate ²	ASR ²
No data available	-	-	-	-

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

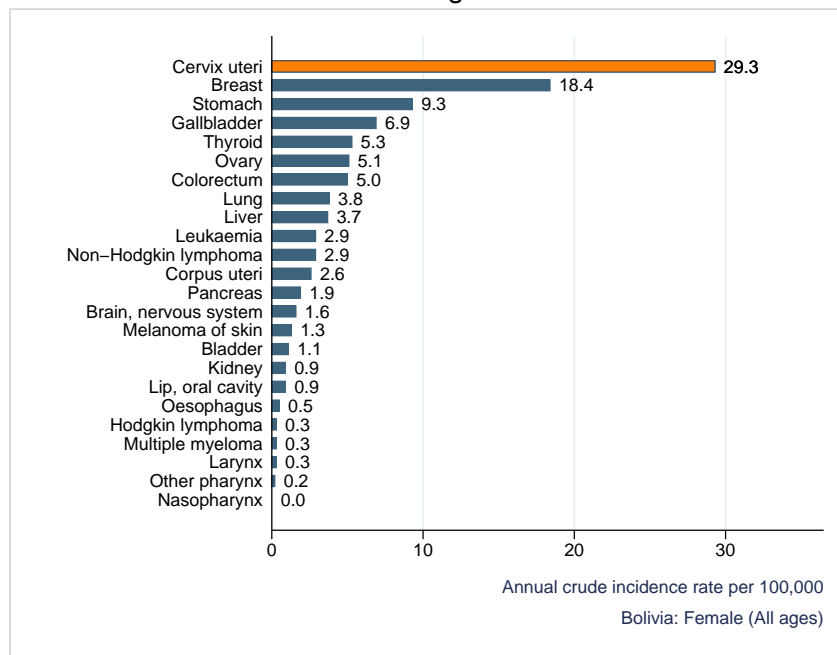
¹ Accumulated number of cases during the period

² Rates per 100,000 women per year.

Data sources:

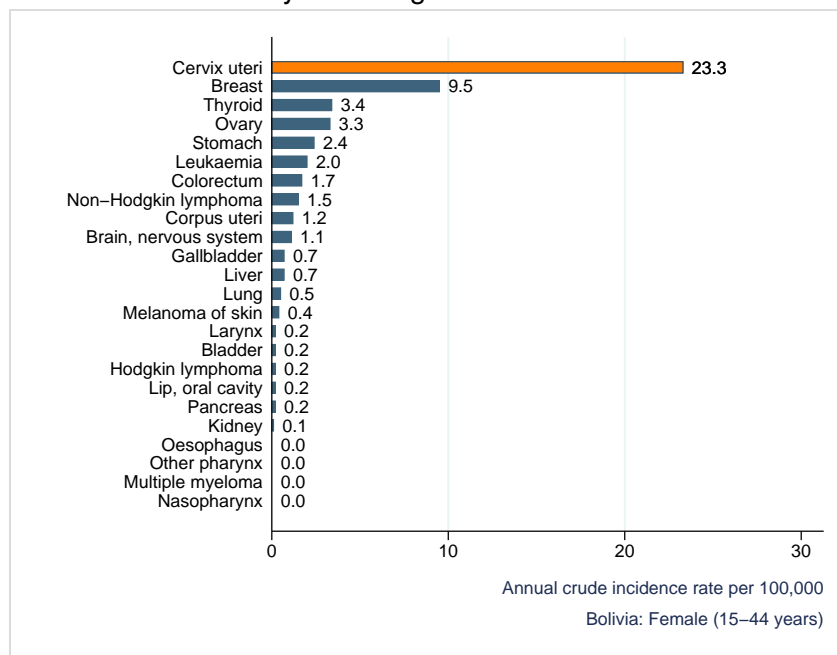
IARC, Cancer Incidence in 5 Continents, Vol IX

Figure 4: Incidence of cervical cancer compared to other cancers in women of all ages in Bolivia



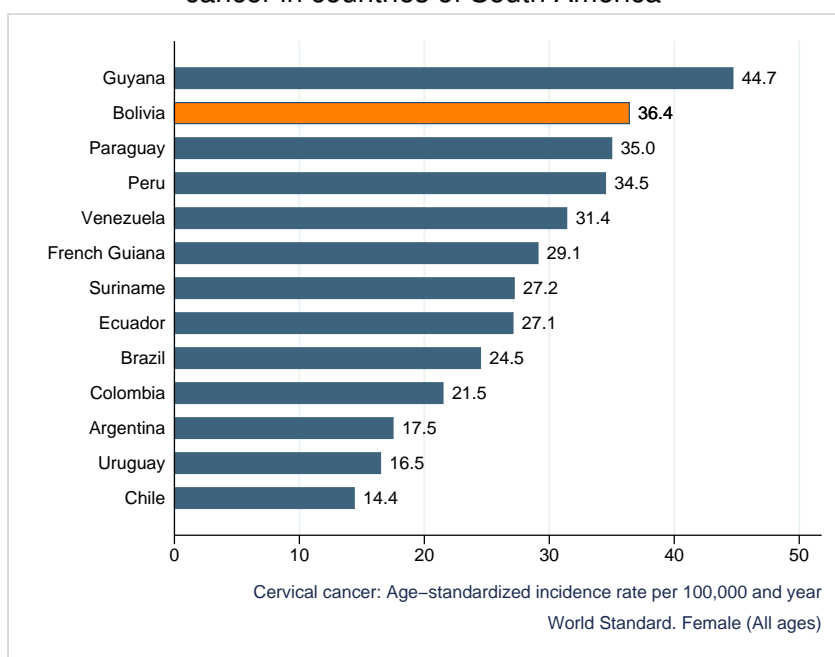
Data sources: IARC, Globocan 2008. For specific estimation methodology refer to http://globocan.iarc.fr/DataSource_and_methods.asp.

Figure 5: Age-specific cervical cancer incidence compared to age-specific incidence of other cancers among women 15-44 years of age in Bolivia



Data sources: IARC, Globocan 2008. Age-specific data from GLOBOCAN 2008 were obtained from IARC, personal communication. For specific estimation methodology refer to http://globocan.iarc.fr/DataSource_and_methods.asp.

Figure 6: Age-standardized incidence rates (ASR) of cervical cancer in countries of South America



Rates per 100,000 women per year. ** No rates are available

Data sources:

IARC, Globocan 2008. Age-specific data from GLOBOCAN 2008 were obtained from IARC, personal communication. For specific estimation methodology refer to http://globocan.iarc.fr/DataSource_and_methods.asp.

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

Cancer registry	Period	Carcinoma			
		Squamous	Adeno	Other	Unspec.
No data available	-	-	-	-	-

Standardized rates have been estimated using the direct method and the World population as the reference.

Rates per 100,000 women per year.

Data sources:

IARC, Cancer Incidence in 5 Continents, Vol IX

Table 6: Percentage distribution of microscopically verified cases of cervical cancer by histological type and cancer registry in Bolivia

Cancer registry	Period	Histology				Number of cases	
		Squamous	Adeno	Other	Unspec.	MV cases	Total cases
No data available	-	-	-	-	-	-	-

Standardized rates have been estimated using the direct method and the World population as the reference.

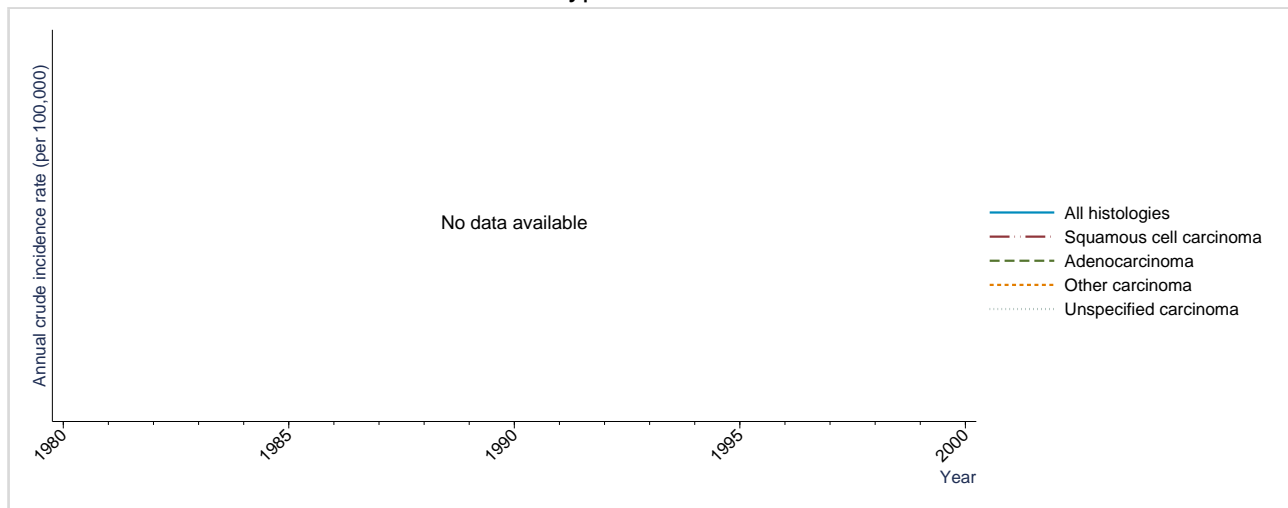
Accumulated number of cases during the period.

MV: Microscopically Verified.

Data sources:

IARC, Cancer Incidence in 5 Continents, Vol IX

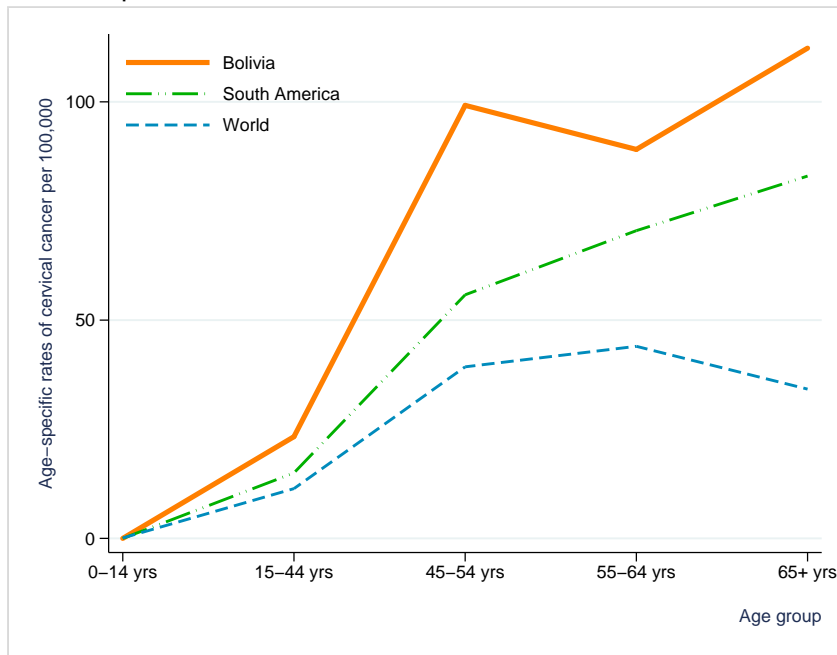
Figure 7: Time trends of age-truncated (15-85 years) incidence rates of cervical cancer by histological type in Bolivia



Data source:

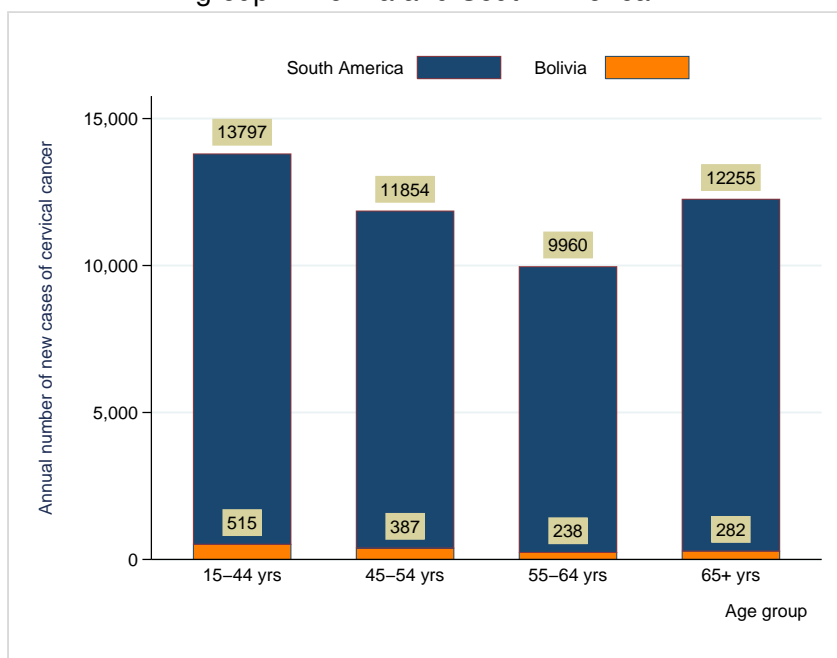
IARC, Cancer Incidence in 5 Continents, Vol I-VIII

Figure 8: Age-specific incidence rates of cervical cancer in Bolivia compared to estimates in South America and the World



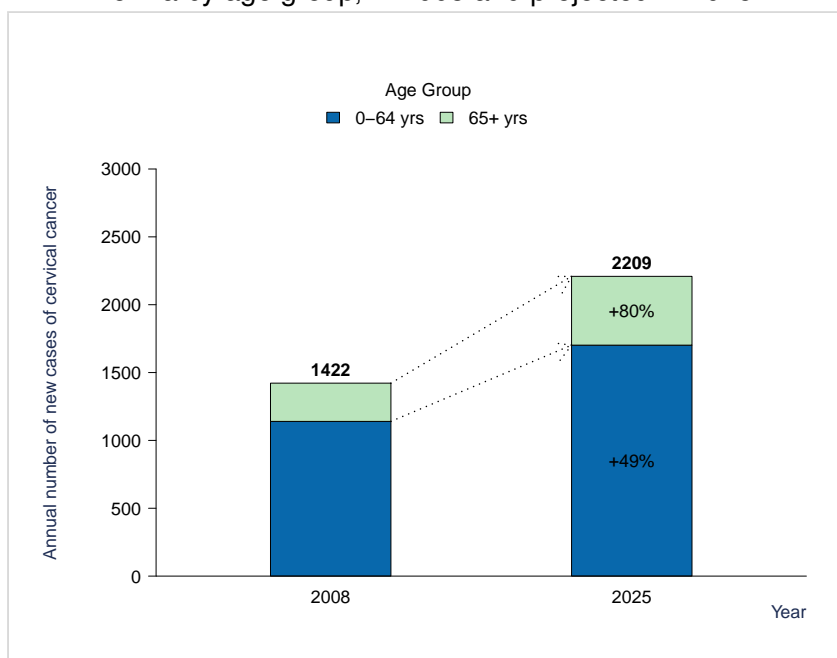
Rates per 100,000 women per year.
 Data sources:
 IARC, Globocan 2008. Age-specific data from GLOBOCAN 2008 were obtained from IARC, personal communication.
 For specific estimation methodology refer to http://globocan.iarc.fr/DataSource_and_methods.asp.

Figure 9: Annual number of new cases of cervical cancer by age group in Bolivia and South America



Data sources:
 IARC, Globocan 2008. Age-specific data from GLOBOCAN 2008 were obtained from IARC, personal communication.
 For specific estimation methodology refer to http://globocan.iarc.fr/DataSource_and_methods.asp.

Figure 10: Estimated number of new cases of cervical cancer in Bolivia by age group, in 2008 and projected in 2025



Projected burden in 2025 is estimated by applying current population forecasts for the country and assuming that current incidence rates of cervical cancer are constant over time.

Data sources:
IARC, Globocan 2008.

3.1.2 Mortality

Table 7: Mortality of cervical cancer in Bolivia, South America and the World

Indicator	Bolivia	South America	World
Crude mortality rate ¹	13.1	11.2	8.2
Age-standardized mortality rate ¹	16.7	10.8	7.8
Cumulative risk (%) ages 0-74 years ¹	1.7	1.2	0.9
Annual number of deaths	638	21836	275128

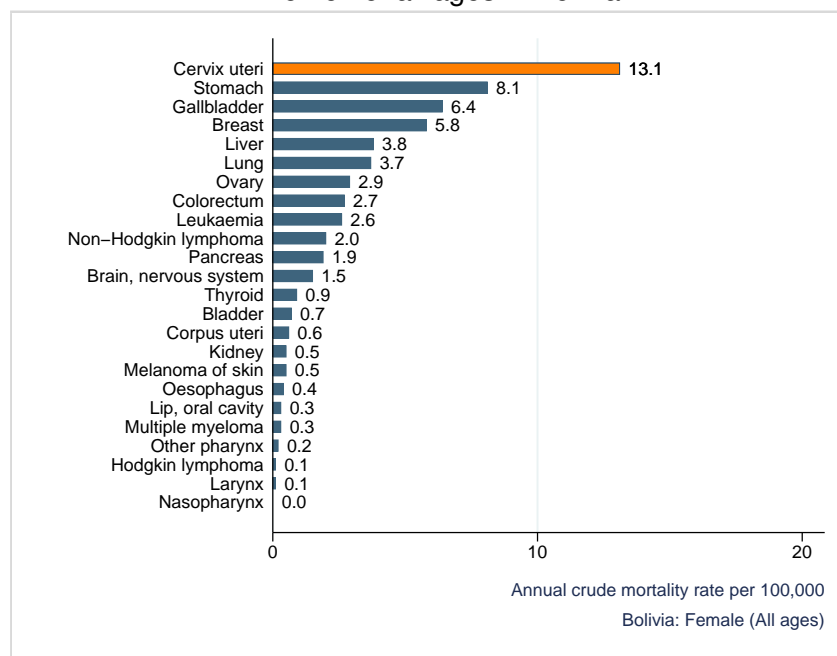
Standardized rates have been estimated using the direct method and the World population as the reference.

¹ Rates per 100,000 women per year.

Data sources:

IARC, Globocan 2008. (Specific methodology for Bolivia: The number of cancer deaths in 2008 was estimated from incidence estimates and site specific survival, estimated by the GDP method. For further details refer to http://globocan.iarc.fr/DataSource_and_methods.asp and <http://globocan.iarc.fr/method/method.asp?country=068>.)

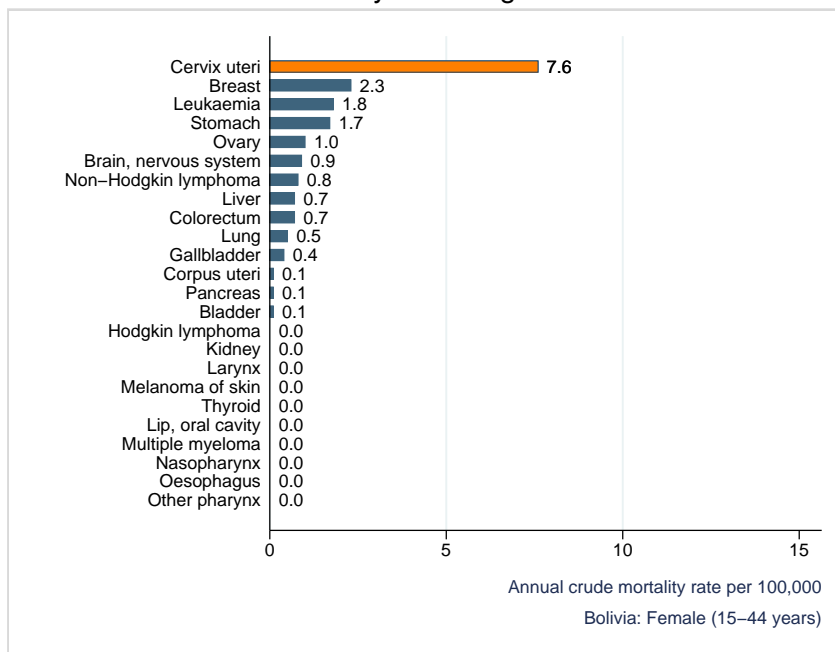
Figure 11: Cervical cancer mortality compared to other cancers in women of all ages in Bolivia



Data sources:

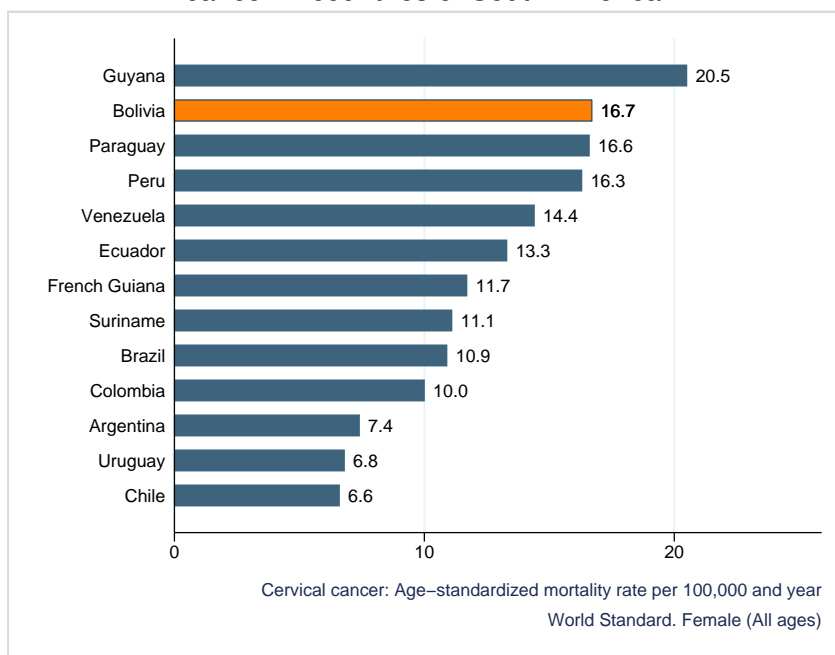
IARC, Globocan 2008. For specific estimation methodology refer to http://globocan.iarc.fr/DataSource_and_methods.asp.

Figure 12: Age-specific mortality rates of cervical cancer compared to age-specific mortality rates of other cancers among women 15-44 years of age in Bolivia



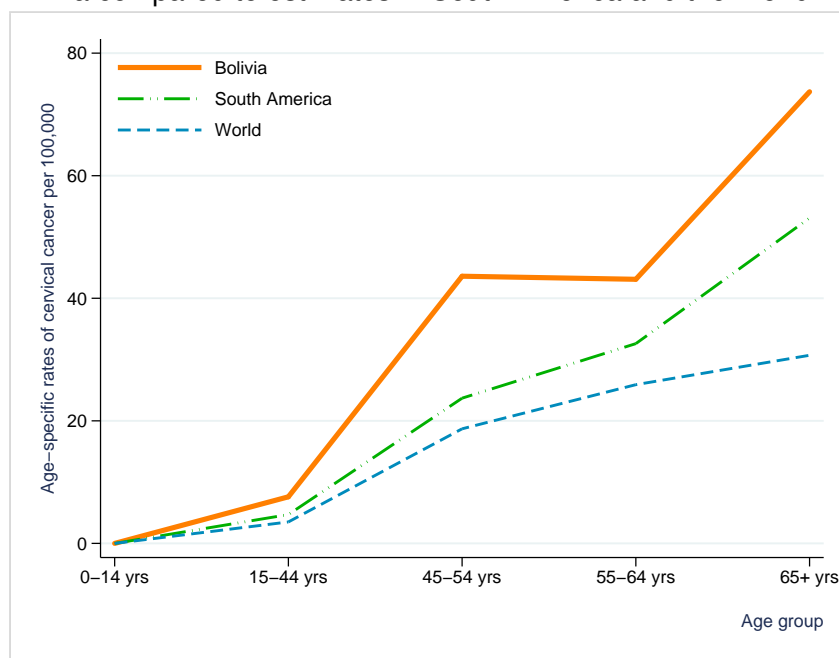
Data sources:
IARC, Globocan 2008. Age-specific data from GLOBOCAN 2008 were obtained from IARC, personal communication. For specific estimation methodology refer to http://globocan.iarc.fr/DataSource_and_methods.asp.

Figure 13: Age-standardized (ASR) mortality rates of cervical cancer in countries of South America



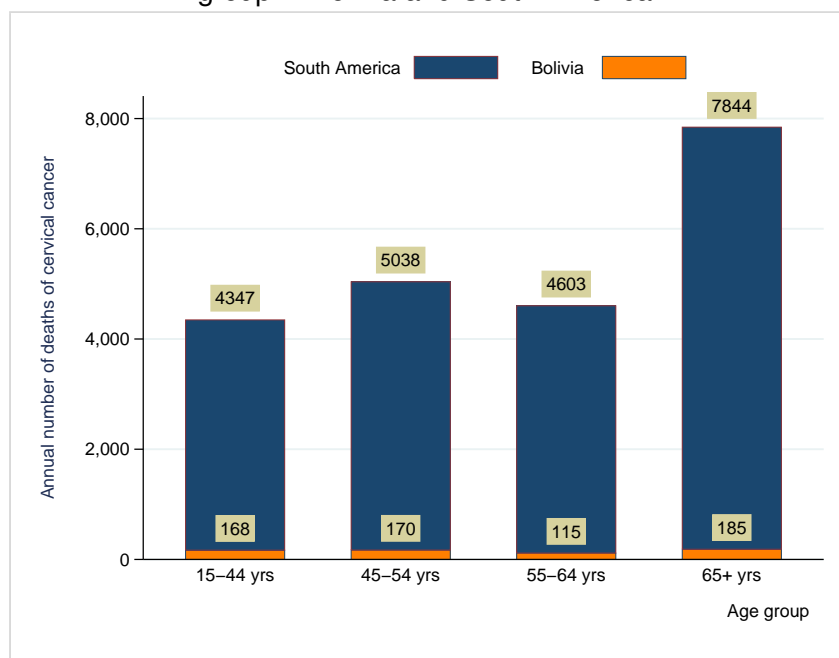
Rates per 100,000 women per year. ** No rates are available
Data sources:
IARC, Globocan 2008. Age-specific data from GLOBOCAN 2008 were obtained from IARC, personal communication. For specific estimation methodology refer to http://globocan.iarc.fr/DataSource_and_methods.asp.

Figure 14: Age-specific mortality rates of cervical cancer in Bolivia compared to estimates in South America and the World



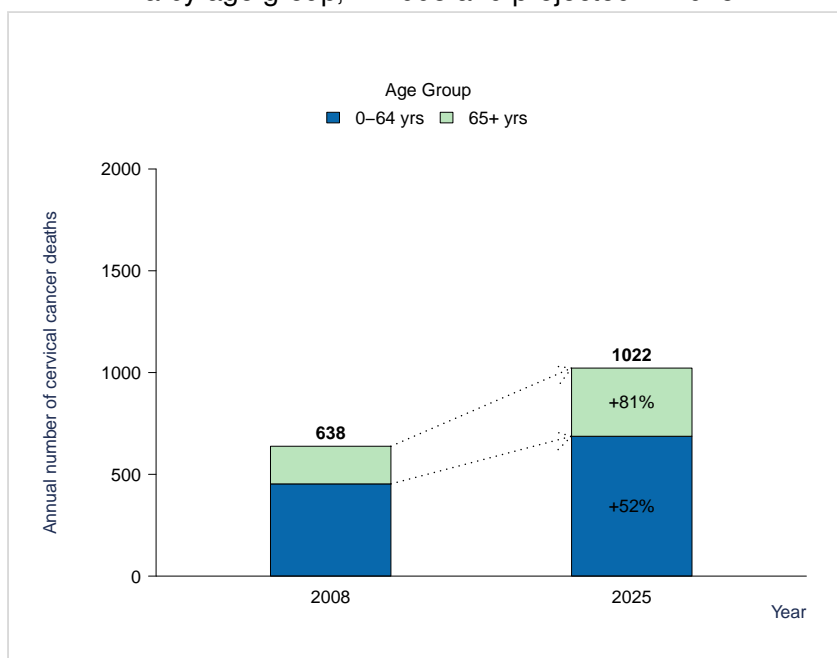
Rates per 100,000 women per year.
 Data sources:
 IARC, Globocan 2008. Age-specific data from GLOBOCAN 2008 were obtained from IARC, personal communication.
 For specific estimation methodology refer to http://globocan.iarc.fr/DataSource_and_methods.asp.

Figure 15: Annual number of deaths of cervical cancer by age group in Bolivia and South America



Data sources:
 IARC, Globocan 2008. Age-specific data from GLOBOCAN 2008 were obtained from IARC, personal communication.
 For specific estimation methodology refer to http://globocan.iarc.fr/DataSource_and_methods.asp.

Figure 16: Estimated number of deaths of cervical cancer in Bolivia by age group, in 2008 and projected in 2025

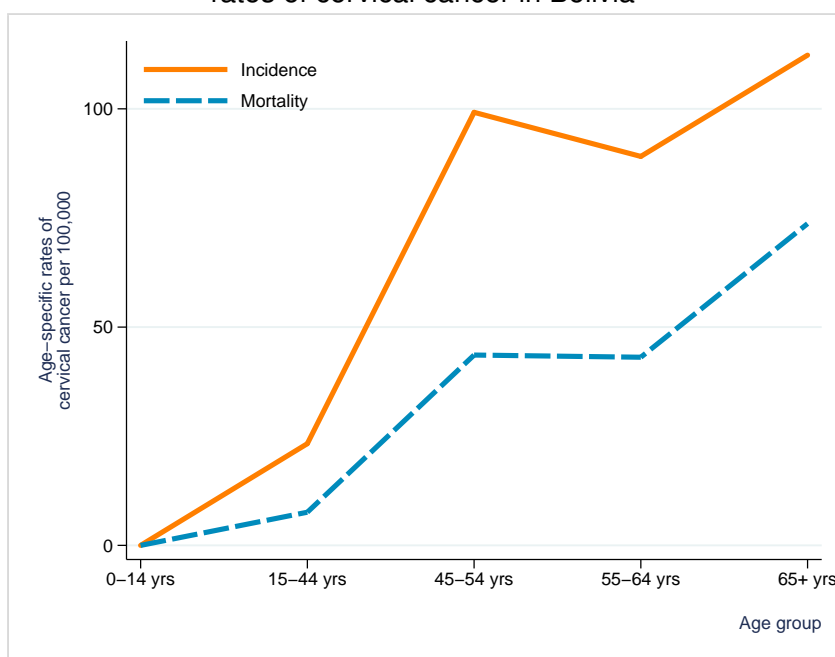


Projected burden in 2025 is estimated by applying current population forecasts for the country and assuming that current incidence rates of cervical cancer are constant over time.

Data sources:
IARC, Globocan 2008.

3.1.3 Comparison of incidence and mortality

Figure 17: Comparison of age-specific incidence and mortality rates of cervical cancer in Bolivia



Rates per 100,000 women per year.

Data sources:

IARC, Globocan 2008. Age-specific data from GLOBOCAN 2008 were obtained from IARC, personal communication. For specific estimation methodology refer to http://globocan.iarc.fr/DataSource_and_methods.asp.

3.2 Anogenital cancers other than the cervix

Data on the role of HPV in anogenital cancers other than the cervix are limited, but there is an increasing body of evidence strongly linking HPV DNA with cancers of the anus, vulva, vagina, and penis. Although these cancers are much less frequent compared to cancer of the cervix, their association with HPV make them potentially preventable and subject to similar preventative strategies as those for cervical cancer.

(*Vaccine 2006, Vol. 24, Supl 3; Vaccine 2008, Vol. 26, Supl 10; IARC Monographs 2007, Vol. 90*)

3.2.1 Anal cancer

Cancer of the anus is rare, with an estimated 99,000 new cases in 2002, 40% of cases in men and 60% in women. Incidence has been increasing in both men and women over the last five decades, and incidence is particularly high among populations of men who have sex with men (MSM) and those who are HIV-infected. These cancers are predominantly squamous cell carcinoma, adenocarcinomas, or basaloid and cloacogenic carcinomas.

Table 8: Incidence of anal cancer by cancer registry and sex in Bolivia

Cancer registry	Period	MALE			FEMALE		
		N cases ¹	Crude rate ²	ASR ²	N cases ¹	Crude rate ³	ASR ³
No data available	-	-	-	-	-	-	-

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

¹ Accumulated number of cases during the period

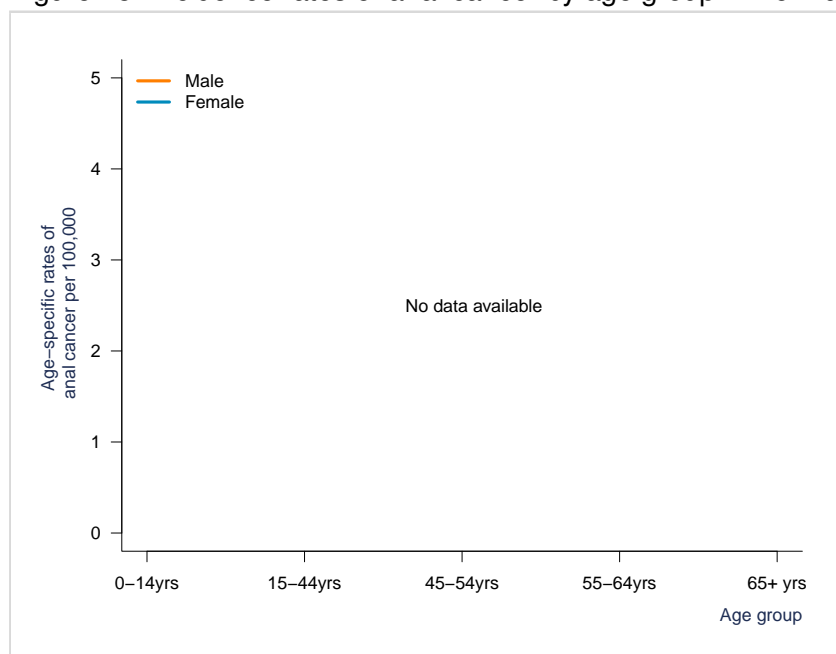
² Rates per 100,000 men per year.

³ Rates per 100,000 women per year.

Data sources:

IARC, Cancer Incidence in 5 Continents, Vol IX

Figure 18: Incidence rates of anal cancer by age group in Bolivia



Data sources:
Cancer Incidence in Five Continents Vol. IX

3.2.2 Vulvar Cancer

Cancer of the vulva is rare among women worldwide, with an estimated 26,800 new cases in 2002, representing 3% of all gynaecologic cancers. Worldwide, about 60% of all vulvar cancer cases occur in developed countries, indicating the limited impact of cervical screening programmes to prevent vulvar and vaginal cancers. Vulvar cancer is common in older women with approximately 66% of cases diagnosed at ≥ 70 years. The majority of vulvar cancer cases are squamous cell carcinoma (90%), followed by melanoma, Bartholin gland carcinoma, basal cell carcinoma, verrucous carcinoma, and Paget's disease.

Table 9: Incidence of vulvar cancer by cancer registry in Bolivia

Cancer registry	Period	N cases ¹	Crude rate ²	ASR ²
No data available	-	-	-	-

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

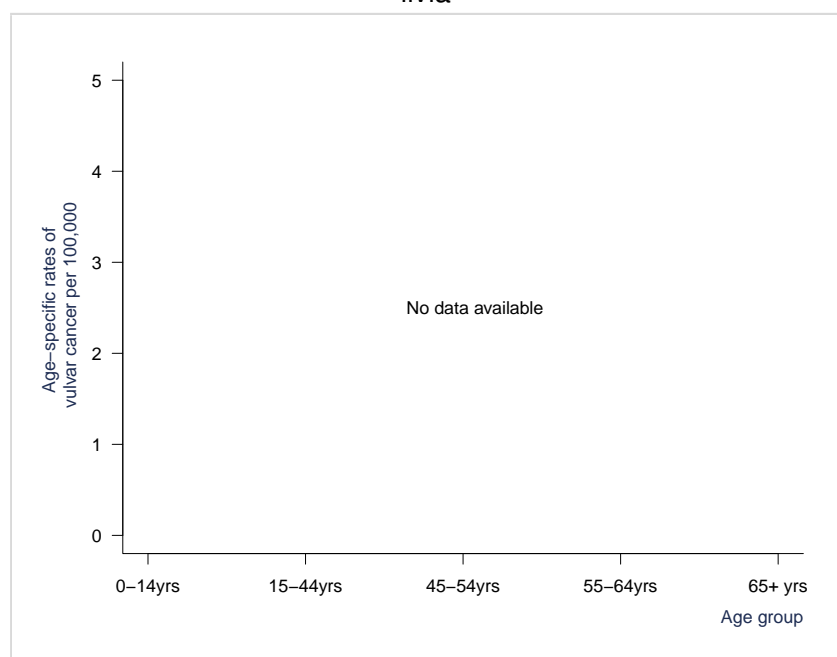
¹ Accumulated number of cases during the period

² Rates per 100,000 women per year.

Data sources:

IARC, Cancer Incidence in 5 Continents, Vol IX

Figure 19: Incidence rates of vulvar cancer by age group in Bolivia



Data sources:

Cancer Incidence in Five Continents Vol. IX

3.2.3 Vaginal cancer

Cancer of the vagina is a rare cancer, with an estimated 13,200 of new cases in 2002, representing 2% of all gynaecologic cancers. Similar to cervical cancer, the majority of vaginal cancer cases (68%) occur in developing countries. Most vaginal cancers are squamous cell carcinoma (90%), followed by clear cell adenocarcinomas and melanoma. There are few data available on vaginal cancers, which are primarily reported in developed countries, and in some settings, metastatic cervical cancer can be misclassified as cancer of the vagina. Vaginal cancer is diagnosed primarily in older women (>=65 years) with a median age at diagnosis of 69 years, and the incidence of carcinoma in situ is diagnosed between the ages of 55 and 70 years.

Table 10: Incidence of vaginal cancer by cancer registry in Bolivia

Cancer registry	Period	N cases ¹	Crude rate ²	ASR ²
No data available	-	-	-	-

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

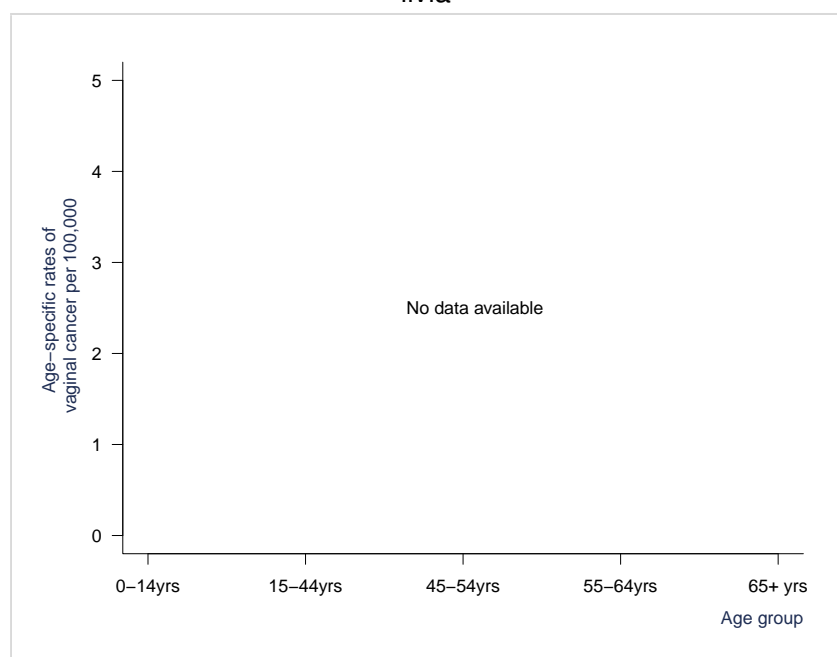
¹ Accumulated number of cases during the period

² Rates per 100,000 women per year.

Data sources:

IARC, Cancer Incidence in 5 Continents, Vol IX

Figure 20: Incidence rates of vaginal cancer by age group in Bolivia



Data sources:

Cancer Incidence in Five Continents Vol. IX

3.2.4 Penile cancer

Cancer of the penis represents less than 0.5% of cancers in men. Incidence rates are less than 1 per 100,000 in Western countries, with higher rates found in Latin America such as Brazil, Colombia, and Peru, Uganda, and specific regions in India and Thailand. A geographical correlation between the incidence of cancer of the penis and cervix and the concordance of these two cancers in married couples suggested the common aetiology of HPV. Cancers of the penis are primarily of the squamous cell histological type.

Table 11: Incidence of penile cancer by cancer registry in Bolivia

Cancer registry	Period	N cases ¹	Crude rate ²	ASR ²
No data available	-	-	-	-

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

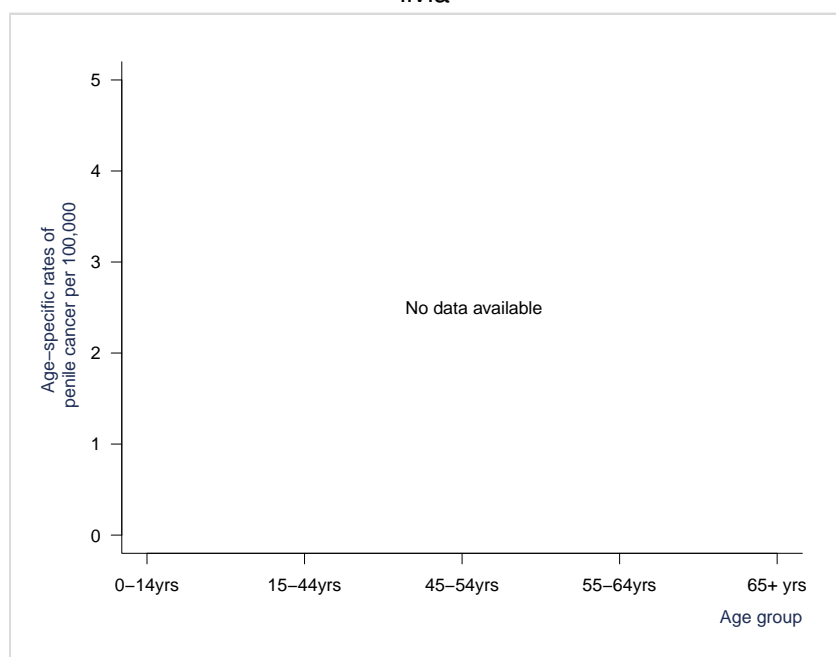
¹ Accumulated number of cases during the period

² Rates per 100,000 men per year.

Data sources:

IARC, Cancer Incidence in 5 Continents, Vol IX

Figure 21: Incidence rates of penile cancer by age group in Bolivia



Data sources:

Cancer Incidence in Five Continents Vol. IX

3.3 Head and neck cancers

About 400,000 new cases of the oral cavity and the pharynx (excluding nasopharynx) and 223,000 deaths occurred worldwide in 2008. Two-thirds of cases occurred in developing countries. The majority of head and neck cancers is associated with high tobacco and alcohol consumption. However, there are about 15-20% of head and neck cancer cases that are associated with HPV and there is growing evidence that these HPV-related cases, particularly oral pharyngeal cancers, are associated with sexual behaviour including the practice of oral sex.

3.3.1 Oral cavity

Table 12: Incidence and mortality of cancer of the oral cavity by sex in Bolivia, South America and the World

Indicator	MALE			FEMALE		
	Bolivia	South America	World	Bolivia	South America	World
INCIDENCE						
Crude incidence rate ¹	1.1	4.7	5.0	0.9	2.2	2.8
Age-standardized incidence rate ¹	1.7	5.2	5.3	1.2	1.9	2.6
Cumulative risk (%) ages 0-74 years ¹	0.3	0.6	0.6	0.2	0.2	0.3
Annual number of new cancer cases	55	8859	170903	42	4185	92958
MORTALITY						
Crude mortality rate ¹	0.5	2.0	2.4	0.3	0.8	1.3
Age-standardized mortality rate ¹	0.7	2.3	2.6	0.5	0.7	1.2
Cumulative risk (%) ages 0-74 years ¹	0.1	0.3	0.3	0.1	0.1	0.1
Annual number of deaths	22	3826	83254	16	1555	44697

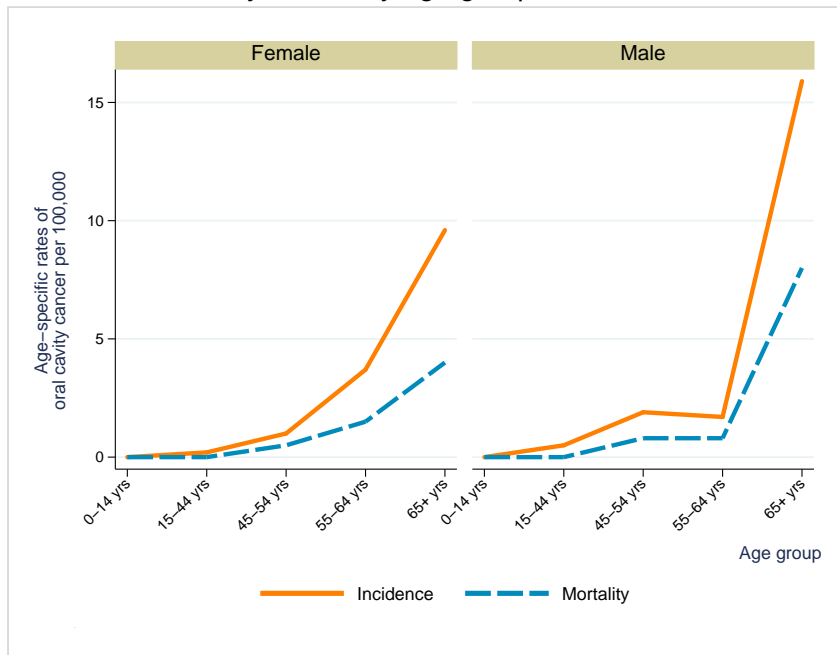
Standardized rates have been estimated using the direct method and the World population as the reference.

¹ Male: Rates per 100,000 men per year. Female: Rates per 100,000 women per year.

Data sources:

IARC, Globocan 2008. (Specific methodology for Bolivia: A) Incidence. Simple average of the incidence rates from: 1) Simple average of the estimated incidence rates for Ecuador and Peru 2) Incidence rates from La Paz (1999). B) Mortality. The number of cancer deaths in 2008 was estimated from incidence estimates and site specific survival, estimated by the GDP method. For further details refer to http://globocan.iarc.fr/DataSource_and_methods.asp and <http://globocan.iarc.fr/method/method.asp?country=068>.)

Figure 22: Comparison of incidence and mortality rates of oral cavity cancer by age group in Bolivia



Data sources: IARC, Globocan 2008. Age-specific data from GLOBOCAN 2008 were obtained from IARC, personal communication. For specific estimation methodology refer to http://globocan.iarc.fr/DataSource_and_methods.asp.

3.3.2 Pharynx (excluding nasopharynx)

Table 13: Incidence and mortality of cancer of the pharynx (excluding nasopharynx) by sex in Bolivia, South America and the World

Indicator	MALE			FEMALE		
	Bolivia	South America	World	Bolivia	South America	World
INCIDENCE						
Crude incidence rate ¹	0.3	2.7	3.2	0.2	0.5	0.8
Age-standardized incidence rate ¹	0.4	3.0	3.4	0.3	0.5	0.8
Cumulative risk (%) ages 0-74 years ¹	0.1	0.4	0.4	0.1	0.1	0.1
Annual number of new cancer cases	13	5052	107941	11	1039	27744
MORTALITY						
Crude mortality rate ¹	0.2	2.0	2.2	0.2	0.4	0.6
Age-standardized mortality rate ¹	0.4	2.3	2.4	0.3	0.4	0.5
Cumulative risk (%) ages 0-74 years ¹	0.1	0.3	0.3	0.0	0.0	0.1
Annual number of deaths	11	3800	76363	9	784	19095

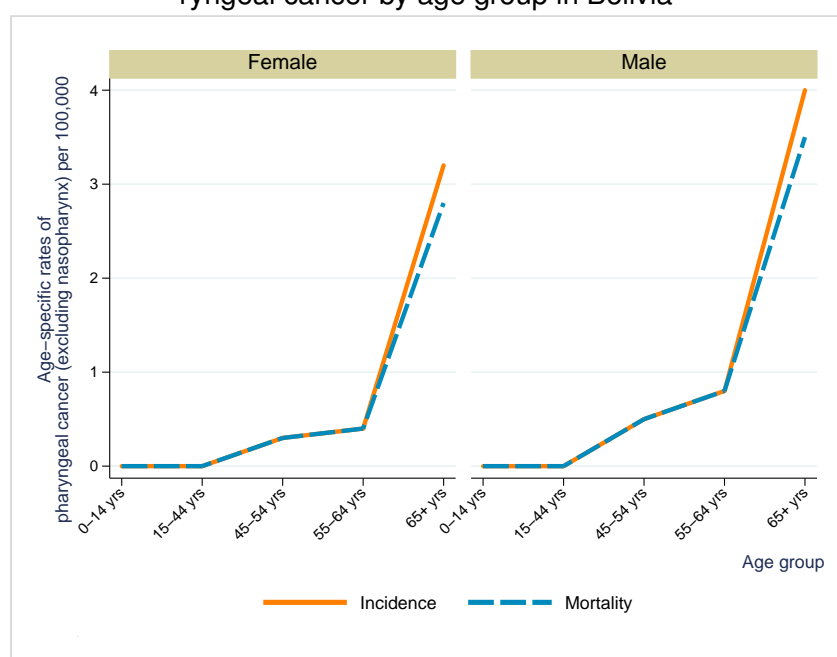
Standardized rates have been estimated using the direct method and the World population as the reference.

¹ Male: Rates per 100,000 men per year. Female: Rates per 100,000 women per year.

Data sources:

IARC, Globocan 2008. (Specific methodology for Bolivia: A) Incidence. Simple average of the incidence rates from: 1) Simple average of the estimated incidence rates for Ecuador and Peru 2) Incidence rates from La Paz (1999). B) Mortality. The number of cancer deaths in 2008 was estimated from incidence estimates and site specific survival, estimated by the GDP method. For further details refer to http://globocan.iarc.fr/DataSource_and_methods.asp and <http://globocan.iarc.fr/method/method.asp?country=068>.)

Figure 23: Comparison of incidence and mortality rates of pharyngeal cancer by age group in Bolivia



Data sources:

IARC, Globocan 2008. Age-specific data from GLOBOCAN 2008 were obtained from IARC, personal communication. For specific estimation methodology refer to http://globocan.iarc.fr/DataSource_and_methods.asp.

4 HPV related statistics

Human papillomavirus 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. This section presents the HPV burden at each of the anogenital tract sites. 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, Supl 3; Vaccine 2008, Vol. 26, Supl 10; IARC Monographs 2007, Vol. 90*)

4.1 HPV burden in women with normal cytology, precancerous cervical 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 means of HPV DNA detection in cervical cells (fresh tissue, paraffin embedded or exfoliated cells).

The prevalence of HPV increases with severity of the lesion. HPV causes virtually 100% of cases of cervical cancer, and an underestimation of HPV prevalence in cervical cancer is most likely due to the limitations of study methodologies. Worldwide, HPV-16 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 HPV-16/18, 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 et al. Vaccine 2006;24(S3):26-34*).

HPV is also responsible for other benign genital infections such as recurrent juvenile respiratory papillomatosis and genital warts, both mainly caused by HPV types 6 and 11 (*Lacey CJ et al. Vaccine 2006; 24(S3):35-41*).

4.1.1 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.

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)

Cancerous cells are confined to the cervix and have not spread to other parts of the body.

Invasive cervical cancer (ICC) / Cervical cancer

If the high-grade precancerous cells invade deeper tissues of the cervix or to other tissues or organs, then the disease is called invasive cervical cancer or cervical cancer.

Invasive squamous cell carcinoma

Invasive carcinoma composed of cells resembling those of squamous epithelium.

Adenocarcinoma

Invasive tumour with glandular and squamous elements intermingled.

4.1.2 HPV prevalence in women with normal cytology

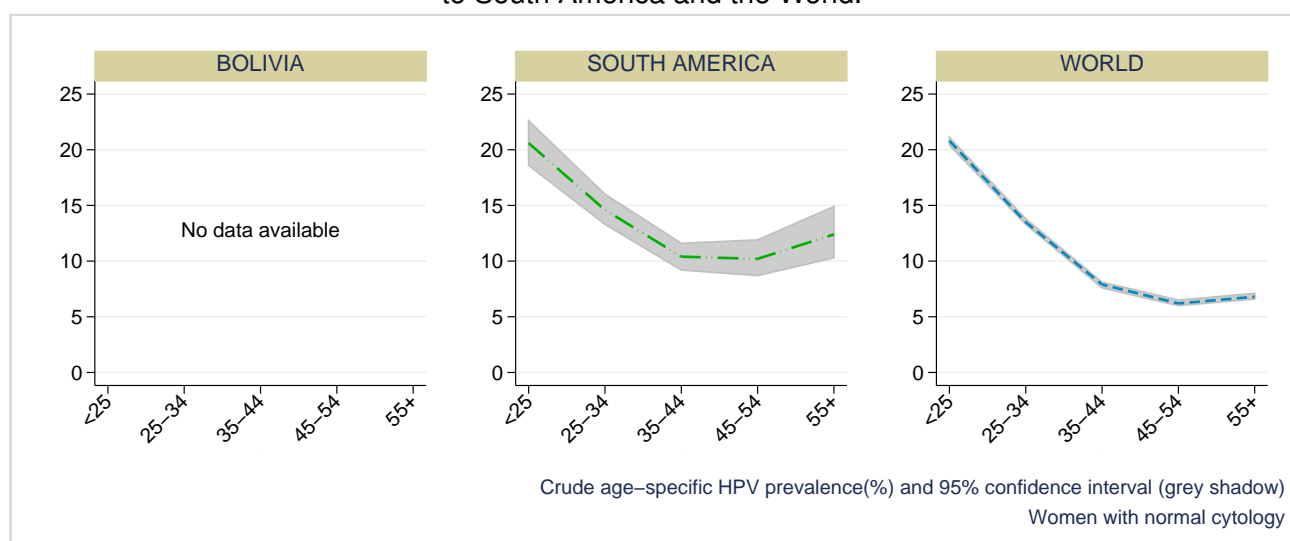
Table 14: Prevalence of HPV among women with normal cytology

Country/Region	Number of women tested	HPV prevalence %	(95% CI)
Bolivia	-	-	-
South America	17500	13.2	(12.7-13.7)
World	436430	11.4	(11.3-11.5)

Data sources:

Data have been compiled by the HPV Information Centre in the Unit of Infections and Cancer at the Institut Catala d'Oncologia and have been published as meta-analysis in: De Sanjosé S, Lancet Infect Dis 2007; 7: 453 and Bruni L, 25th IPV Society Meeting, Malmo, Sweden, 8-14 May 2009 (Manuscript in preparation). For South America and the World, refer to specific reports or methods document for complete data sources.

Figure 24: Crude age-specific HPV prevalence in women with normal cytology in Bolivia compared to South America and the World.



Data sources:

Data have been compiled by the HPV Information Centre in the Unit of Infections and Cancer at the Institut Catala d'Oncologia and have been published as meta-analysis in: De Sanjosé S, Lancet Infect Dis 2007; 7: 453 and Bruni L, 25th IPV Society Meeting, Malmo, Sweden, 8-14 May 2009 (Manuscript in preparation). For South America and the World, refer to specific reports or methods document for complete data sources.

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

Table 15: Prevalence of HPV-16 and HPV-18 by cytology in Bolivia, South America and the World

	Bolivia		South America		World	
	No. tested	HPV 16/18 Prevalence % (95% CI)	No. tested	HPV 16/18 Prevalence % (95%CI)	No. tested	HPV 16/18 Prevalence % (95%CI)
Normal cytology ^a	-	--	5854	5.2 (4.6-5.8)	218339	3.8 (3.7-3.9)
Low-grade lesions ^{†b}	-	--	570	34.3 (30.5-38.4)	14762	24.3 (23.6-25.0)
High-grade lesions ^{‡c}	-	--	572	55.3 (51.1-59.4)	14901	51.1 (50.3-51.9)
Cervical cancer ^d	47	38.3 (24.5-53.6)	1520	67.7 (65.3-70.0)	22826	70.9 (70.3-71.5)

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

Abbreviations used:

95% CI: 95% Confidence Interval

†Low-grade lesions: LSIL or CIN-1

‡High-grade lesions: CIN-2, CIN-3, CIS or HSIL

Data sources:

^a Data have been compiled by the HPV Information Centre in the Unit of Infections and Cancer at the Institut Catala d'Oncologia and have been published as meta-analysis in: De Sanjosé S, Lancet Infect Dis 2007; 7: 453 and Bruni L, 25th IPV Society Meeting, Malmo, Sweden, 8-14 May 2009 (Manuscript in preparation).

^b Data have been compiled by the IARC Infection and Cancer Epidemiology Group and have been published as a systematic review and meta-analysis in: Clifford GM, Cancer Epidemiol Biomarkers Prev 2005; 14: 1157

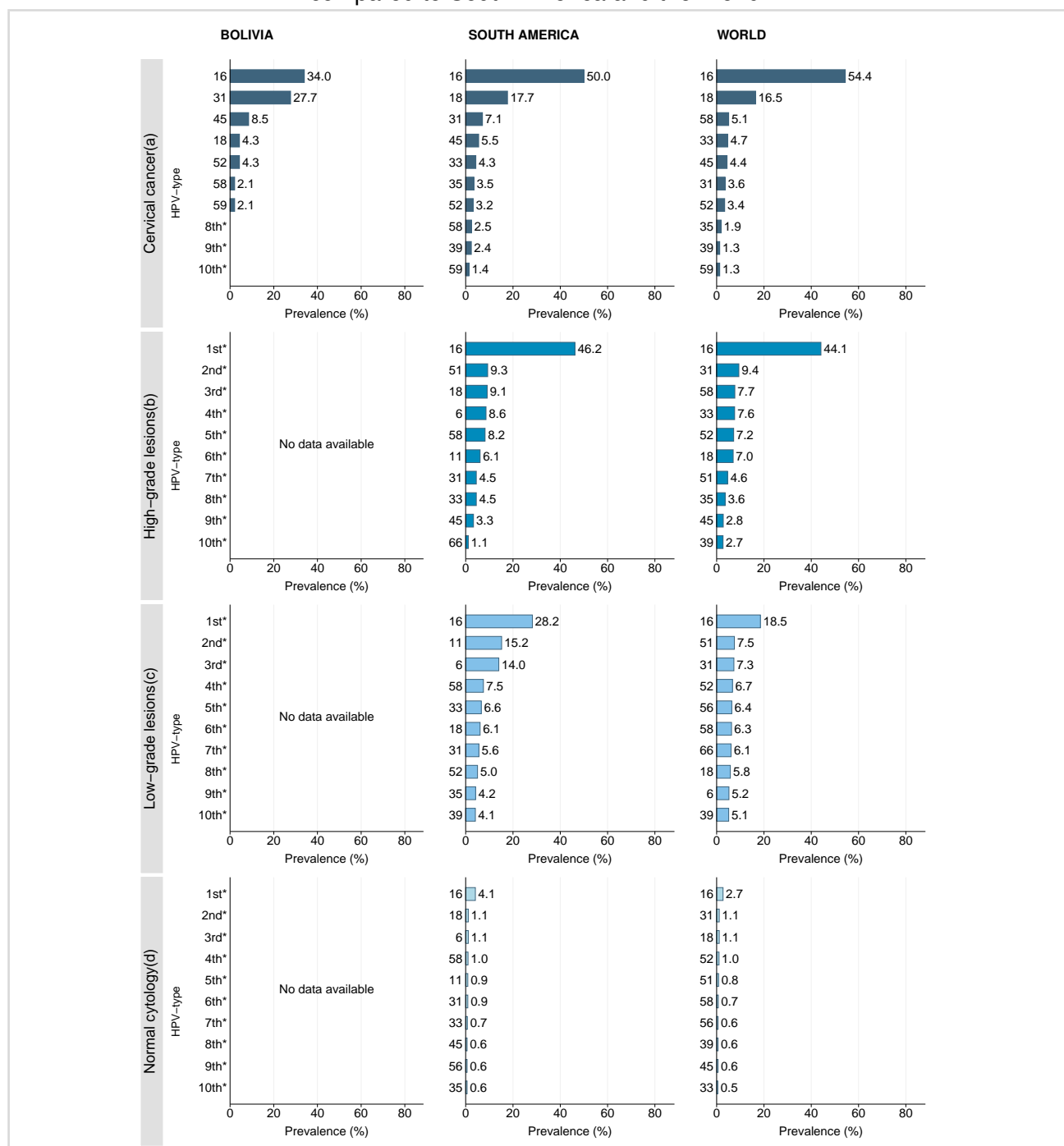
^c Data have been compiled by the IARC Infection and Cancer Epidemiology Group and have been published as a systematic review and meta-analysis in: Clifford G, Br J Cancer 2003;89:101 | Smith JS Int J Cancer 2007;121:621

^d Data have been compiled by the IARC Infection and Cancer Epidemiology Group and have been published as a systematic review and meta-analysis in: Clifford G, Br J Cancer 2003;88:63 | Clifford G, Int J Cancer 2008; 122: 1684

Specific for Bolivia: Bosch FX, J Natl Cancer Inst 1995; 87: 796

For South America and the World, refer to specific reports or methods document for complete data sources.

Figure 25: Ten most frequent HPV types among women with and without cervical lesions in Bolivia compared to South America and the World



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

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

The ranking of the ten most frequent HPV types may present less than ten types because only a limited number of types were tested or were HPV-positive.

Data sources:

^a Data have been compiled by the IARC Infection and Cancer Epidemiology Group and have been published as a systematic review and meta-analysis in: Clifford G, Br J Cancer 2003;88:63 | Clifford G, Int J Cancer 2008; 122: 1684
Specific for Bolivia: Bosch FX, J Natl Cancer Inst 1995; 87: 796

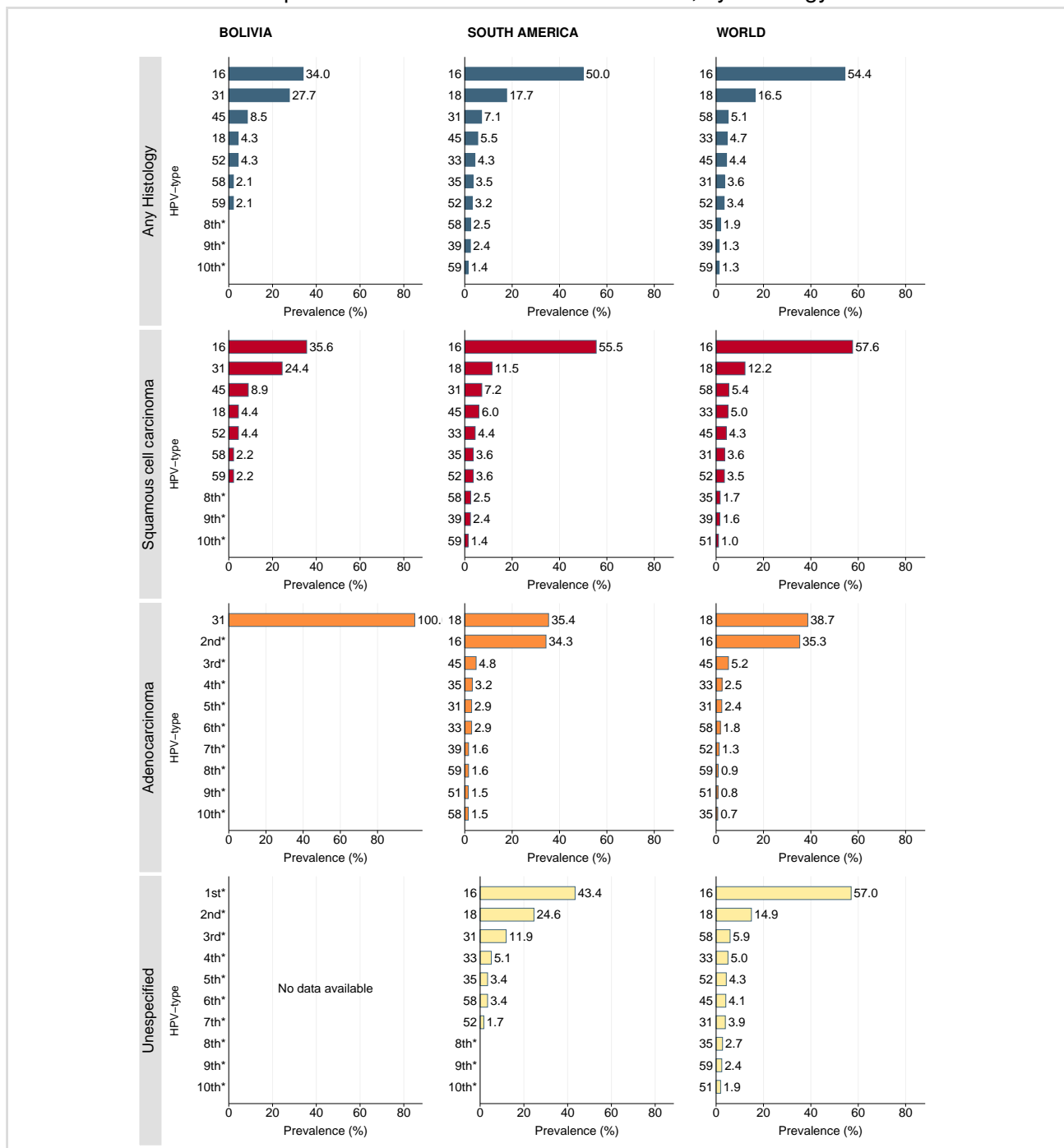
^b Data have been compiled by the IARC Infection and Cancer Epidemiology Group and have been published as a systematic review and meta-analysis in: Clifford G, Br J Cancer 2003;89:101 | Smith JS Int J Cancer 2007;121:621

^c Data have been compiled by the IARC Infection and Cancer Epidemiology Group and have been published as a systematic review and meta-analysis in: Clifford GM, Cancer Epidemiol Biomarkers Prev 2005; 14: 1157

^d Data have been compiled by the HPV Information Centre in the Unit of Infections and Cancer at the Institut Catala d'Oncologia and have been published as meta-analysis in: De Sanjosé S, Lancet Infect Dis 2007; 7: 453 and Bruni L, 25th IPV Society Meeting, Malmo, Sweden, 8-14 May 2009 (Manuscript in preparation).

For South America and the World, refer to specific reports or methods document for complete data sources.

Figure 26: Ten most frequent HPV types among women with invasive cervical cancer in Bolivia compared to South America and the World, by histology



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

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

The ranking of the ten most frequent HPV types may present less than ten types because only a limited number of types were tested or were HPV-positive.

Data sources:

Data have been compiled by the IARC Infection and Cancer Epidemiology Group and have been published as a systematic review and meta-analysis in: Clifford G, Br J Cancer 2003;88:63 | Clifford G, Int J Cancer 2008; 122: 1684

Bosch FX, J Natl Cancer Inst 1995; 87: 796

For South America and the World, refer to specific reports or methods document for complete data sources.

Table 16: Type-specific HPV prevalence in women with normal cytology, precancerous cervical lesions and invasive cervical cancer in Bolivia

HPV Type	Normal cytology ^a		Low-grade lesions ^{†b}		High-grade lesions ^{‡c}		Cervical cancer ^d	
	No. tested	HPV Prev % (95%CI)	No. tested	HPV Prev % (95%CI)	No. tested	HPV Prev % (95%CI)	No. tested	HPV Prev % (95%CI)
6	-	--	-	--	-	--	47	0.0 (0.0-7.5)
11	-	--	-	--	-	--	47	0.0 (0.0-7.5)
13	-	--	-	--	-	--	-	--
16	-	--	-	--	-	--	47	34.0 (20.9-49.3)
18	-	--	-	--	-	--	47	4.3 (0.5-14.5)
26	-	--	-	--	-	--	-	--
30	-	--	-	--	-	--	-	--
31	-	--	-	--	-	--	47	27.7 (15.6-42.6)
32	-	--	-	--	-	--	-	--
33	-	--	-	--	-	--	47	0.0 (0.0-7.5)
34	-	--	-	--	-	--	-	--
35	-	--	-	--	-	--	47	0.0 (0.0-7.5)
39	-	--	-	--	-	--	47	0.0 (0.0-7.5)
40	-	--	-	--	-	--	-	--
42	-	--	-	--	-	--	-	--
43	-	--	-	--	-	--	-	--
44	-	--	-	--	-	--	-	--
45	-	--	-	--	-	--	47	8.5 (2.4-20.4)
51	-	--	-	--	-	--	47	0.0 (0.0-7.5)
52	-	--	-	--	-	--	47	4.3 (0.5-14.5)
53	-	--	-	--	-	--	-	--
54	-	--	-	--	-	--	-	--
55	-	--	-	--	-	--	-	--
56	-	--	-	--	-	--	47	0.0 (0.0-7.5)
57	-	--	-	--	-	--	-	--
58	-	--	-	--	-	--	47	2.1 (0.1-11.3)
59	-	--	-	--	-	--	47	2.1 (0.1-11.3)
61	-	--	-	--	-	--	-	--
62	-	--	-	--	-	--	-	--
64	-	--	-	--	-	--	-	--
66	-	--	-	--	-	--	47	0.0 (0.0-7.5)
67	-	--	-	--	-	--	-	--
68	-	--	-	--	-	--	47	0.0 (0.0-7.5)
69	-	--	-	--	-	--	-	--
70	-	--	-	--	-	--	47	0.0 (0.0-7.5)
71	-	--	-	--	-	--	-	--
72	-	--	-	--	-	--	-	--
73	-	--	-	--	-	--	47	0.0 (0.0-7.5)
74	-	--	-	--	-	--	-	--
81	-	--	-	--	-	--	-	--
82	-	--	-	--	-	--	47	0.0 (0.0-7.5)
83	-	--	-	--	-	--	-	--
84	-	--	-	--	-	--	-	--
85	-	--	-	--	-	--	-	--
86	-	--	-	--	-	--	-	--
89	-	--	-	--	-	--	-	--
90	-	--	-	--	-	--	-	--
91	-	--	-	--	-	--	-	--

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

Abbreviations used:

95% CI: 95% Confidence Interval

†Low-grade lesions: LSIL or CIN-1

‡High-grade lesions: CIN-2, CIN-3, CIS or HSIL

Data sources:

^a Data have been compiled by the HPV Information Centre in the Unit of Infections and Cancer at the Institut Catala d'Oncologia and have been published as meta-analysis in: De Sanjosé S, Lancet Infect Dis 2007; 7: 453 and Bruni L, 25th IPV Society Meeting, Malmo, Sweden, 8-14 May 2009 (Manuscript in preparation).

^b Data have been compiled by the IARC Infection and Cancer Epidemiology Group and have been published as a systematic review and meta-analysis in: Clifford GM, Cancer Epidemiol Biomarkers Prev 2005; 14: 1157

^c Data have been compiled by the IARC Infection and Cancer Epidemiology Group and have been published as a systematic review and meta-analysis in: Clifford G, Br J Cancer 2003;89:101 | Smith JS Int J Cancer 2007;121:621

^d Data have been compiled by the IARC Infection and Cancer Epidemiology Group and have been published as a systematic review and meta-analysis in: Clifford G, Br J Cancer 2003;88:63 | Clifford G, Int J Cancer 2008; 122: 1684

Bosch FX, J Natl Cancer Inst 1995; 87: 796

Table 17: Type-specific HPV prevalence among invasive cervical cancer cases in Bolivia, by histology

HPV Type	Any Histology		Squamous cell carcinoma		Adenocarcinoma		Unspecified	
	No. tested	HPV Prev % (95%CI)	No. tested	HPV Prev % (95%CI)	No. tested	HPV Prev % (95%CI)	No. tested	HPV Prev % (95%CI)
6	47	0.0 (0.0-7.5)	45	0.0 (0.0-7.9)	2	0.0 (0.0-84.2)	-	--
11	47	0.0 (0.0-7.5)	45	0.0 (0.0-7.9)	2	0.0 (0.0-84.2)	-	--
16	47	34.0 (20.9-49.3)	45	35.6 (21.9-51.2)	2	0.0 (0.0-84.2)	-	--
18	47	4.3 (0.5-14.5)	45	4.4 (0.5-15.1)	2	0.0 (0.0-84.2)	-	--
31	47	27.7 (15.6-42.6)	45	24.4 (12.9-39.5)	2	100.0 (15.8-100.0)	-	--
33	47	0.0 (0.0-7.5)	45	0.0 (0.0-7.9)	2	0.0 (0.0-84.2)	-	--
35	47	0.0 (0.0-7.5)	45	0.0 (0.0-7.9)	2	0.0 (0.0-84.2)	-	--
39	47	0.0 (0.0-7.5)	45	0.0 (0.0-7.9)	2	0.0 (0.0-84.2)	-	--
45	47	8.5 (2.4-20.4)	45	8.9 (2.5-21.2)	2	0.0 (0.0-84.2)	-	--
51	47	0.0 (0.0-7.5)	45	0.0 (0.0-7.9)	2	0.0 (0.0-84.2)	-	--
52	47	4.3 (0.5-14.5)	45	4.4 (0.5-15.1)	2	0.0 (0.0-84.2)	-	--
56	47	0.0 (0.0-7.5)	45	0.0 (0.0-7.9)	2	0.0 (0.0-84.2)	-	--
58	47	2.1 (0.1-11.3)	45	2.2 (0.1-11.8)	2	0.0 (0.0-84.2)	-	--
59	47	2.1 (0.1-11.3)	45	2.2 (0.1-11.8)	2	0.0 (0.0-84.2)	-	--
66	47	0.0 (0.0-7.5)	45	0.0 (0.0-7.9)	2	0.0 (0.0-84.2)	-	--
68	47	0.0 (0.0-7.5)	45	0.0 (0.0-7.9)	2	0.0 (0.0-84.2)	-	--
70	47	0.0 (0.0-7.5)	45	0.0 (0.0-7.9)	2	0.0 (0.0-84.2)	-	--
73	47	0.0 (0.0-7.5)	45	0.0 (0.0-7.9)	2	0.0 (0.0-84.2)	-	--
82	47	0.0 (0.0-7.5)	45	0.0 (0.0-7.9)	2	0.0 (0.0-84.2)	-	--

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

Abbreviations used:

95% CI: 95% Confidence Interval

Data sources:

Data have been compiled by the IARC Infection and Cancer Epidemiology Group and have been published as a systematic review and meta-analysis in: Clifford G, Br J Cancer 2003;88:63 | Clifford G, Int J Cancer 2008; 122: 1684
Bosch FX, J Natl Cancer Inst 1995; 87: 796

4.2 HPV burden in anogenital cancers other than the cervix

4.2.1 Anal cancer

Anal cancer is similar to cervical cancer with respect to overall HPV DNA positivity, with approximately 85% of cases associated with HPV infection worldwide. HPV-16 is the most common detected type, representing 87% of all HPV-positive tumours. HPV-18 is the second most common type detected and is found in approximately 9% of cases. HPV DNA is also detected in the majority of precancerous anal lesions (AIN) and the prevalence of HPV increases with the severity of the lesion, 75% in AIN1, 86% in AIN2, and 94% in AIN3. In this section, the burden of HPV among cases of anal cancers in Bolivia is presented.

(*Vaccine 2006, Vol. 24, Supl 3; Vaccine 2008, Vol. 26, Supl 10; IARC Monographs 2007, Vol. 90*)

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

Study	HPV detection method	No. tested	HPV prevalence % (95% CI)
No data available	-	-	-

Data sources:

Ongoing data are compiled by the HPV Information Centre in the Unit of Infections and Cancer at the Institut Catala d'Oncologia based on the initial meta-analysis conducted by the IARC Infection and Cancer Epidemiology Group in: De Vuyst H, Int J Cancer 2009; 124: 1626.

Table 19: Pooled estimate of HPV prevalence among cases of anal cancer by sex in Bolivia

Sex	No. tested	HPV prevalence	
		%	(95% CI)
Female	-	-	-
Male	-	-	-
Unspecified	-	-	-

Data sources:

Ongoing data are compiled by the HPV Information Centre in the Unit of Infections and Cancer at the Institut Catala d'Oncologia based on the initial meta-analysis conducted by the IARC Infection and Cancer Epidemiology Group in: De Vuyst H, Int J Cancer 2009; 124: 1626.

Table 20: Pooled estimate of HPV prevalence among men who have sex with men (MSM) and non-MSM with anal cancer in Bolivia

MSM	No. tested	HPV prevalence	
		%	(95% CI)
MSM	-	-	-
Non-MSM	-	-	-
Unspecified	-	-	-

Data sources:

Ongoing data are compiled by the HPV Information Centre in the Unit of Infections and Cancer at the Institut Catala d'Oncologia based on the initial meta-analysis conducted by the IARC Infection and Cancer Epidemiology Group in: De Vuyst H, Int J Cancer 2009; 124: 1626.

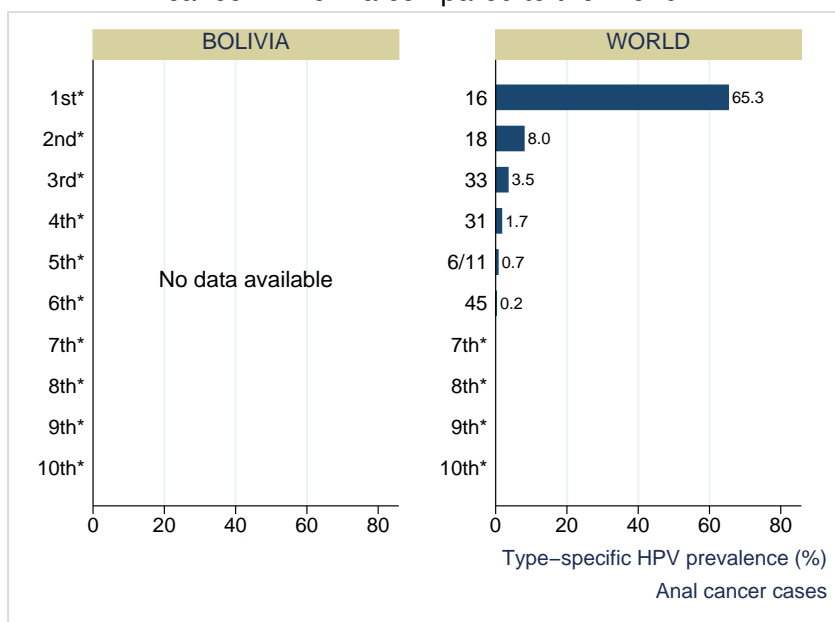
Table 21: Pooled estimate of HPV prevalence among cases of anal cancer by histology in Bolivia

Histology	No. tested	HPV prevalence	
		%	(95% CI)
Any Histology	-	-	-
Basaloid/Cloacogenic SCC	-	-	-
Keratinizing SCC	-	-	-
Unspecified SCC	-	-	-
Adenocarcinoma	-	-	-
Others	-	-	-

Data sources:

Ongoing data are compiled by the HPV Information Centre in the Unit of Infections and Cancer at the Institut Catala d'Oncologia based on the initial meta-analysis conducted by the IARC Infection and Cancer Epidemiology Group in: De Vuyst H, Int J Cancer 2009; 124: 1626.

Figure 27: Ten most frequent HPV types among cases of anal cancer in Bolivia compared to the World



*Not available. No more types than shown were tested or were positive

Data sources:

Ongoing data are compiled by the HPV Information Centre in the Unit of Infections and Cancer at the Institut Catala d'Oncologia based on the initial meta-analysis conducted by the IARC Infection and Cancer Epidemiology Group in: De Vuyst H, Int J Cancer 2009; 124: 1626.

World: Refer to specific World report or methods document for data sources

4.2.2 Vulvar cancer

Vulvar cancer has two distinct histological patterns with two different risk factor profiles: (1) basaloid/warty types (2) keratinizing types. The majority of vulvar carcinomas are of the basaloid warty type (>55%), which occur mainly in younger women compared to the keratinizing types, and are associated with similar risk factors for HPV infection in the cervix. In contrast, keratinizing vulvar carcinomas are associated with a low prevalence of HPV DNA ($\leq 10\%$) that occur mainly in older women and are associated with lichen planus. In a case series, HPV DNA prevalence ranged from 72-100% among cases of high-grade vulvar neoplasias (VIN3) and 27.3-100% among vulvar carcinomas (3.9-6.3% in keratinizing types). Similarly, a meta-analysis estimated a HPV prevalence of 76% for VIN and 36% for vulvar carcinomas. HPV-16 is the most common detected type (65-93% in VIN and 71% for vulvar cancer) followed by HPV-18. In this section, the HPV burden among cases of vulvar cancers in Bolivia is presented.

(*Vaccine 2006, Vol. 24, Supl 3; Vaccine 2008, Vol. 26, Supl 10; IARC Monographs 2007, Vol. 90*)

Table 22: Studies on HPV prevalence among cases of vulvar cancer in Bolivia

Study	HPV detection method	No. tested	HPV prevalence	
			%	(95% CI)
No data available	-	-	-	-

Data sources:

Ongoing data are compiled by the HPV Information Centre in the Unit of Infections and Cancer at the Institut Catala d'Oncologia based on the initial meta-analysis conducted by the IARC Infection and Cancer Epidemiology Group in: De Vuyst H, *Int J Cancer* 2009; 124: 1626.

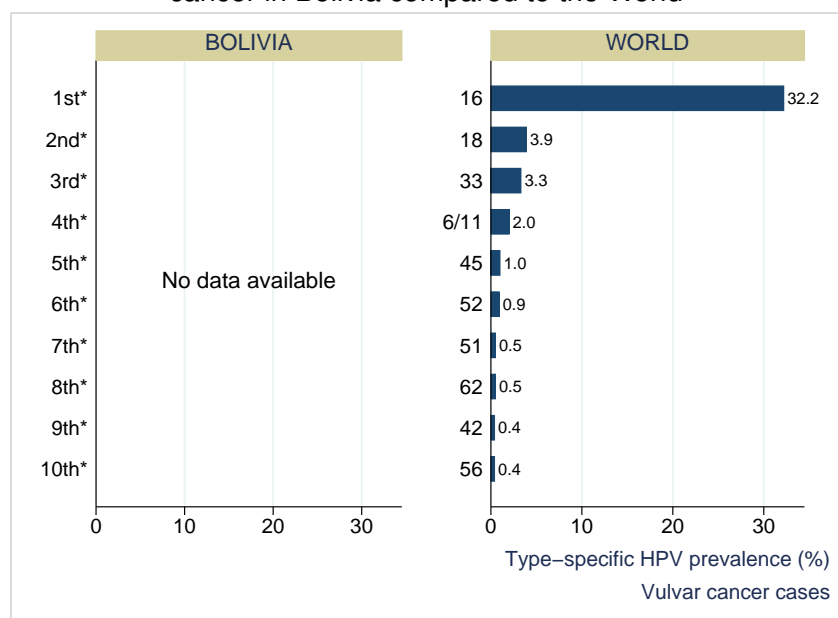
Table 23: Pooled estimate of HPV prevalence among cases of vulvar cancer by histology in Bolivia

Histology	No. tested	HPV prevalence	
		%	(95% CI)
Any Histology	-	-	-
Warty-Basaloid SCC	-	-	-
Keratinizing SCC	-	-	-
Verrucous SCC	-	-	-
Unspecified SCC	-	-	-
Adenocarcinoma	-	-	-

Data sources:

Ongoing data are compiled by the HPV Information Centre in the Unit of Infections and Cancer at the Institut Catala d'Oncologia based on the initial meta-analysis conducted by the IARC Infection and Cancer Epidemiology Group in: De Vuyst H, Int J Cancer 2009; 124: 1626.

Figure 28: Ten most frequent HPV types among cases of vulvar cancer in Bolivia compared to the World



*Not available. No more types than shown were tested or were positive

Data sources:

Ongoing data are compiled by the HPV Information Centre in the Unit of Infections and Cancer at the Institut Catala d'Oncologia based on the initial meta-analysis conducted by the IARC Infection and Cancer Epidemiology Group in: De Vuyst H, Int J Cancer 2009; 124: 1626.

World: Refer to specific World report or methods document for data sources

4.2.3 Vaginal cancer

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 91% of invasive vaginal carcinomas and 82% of high-grade vaginal neoplasias (VAIN3). In a case series of vaginal cancers, HPV-16 is the most common type in at least 70% of HPV-positive carcinomas. In this section, the HPV burden among cases of vaginal cancers in Bolivia is presented. (*Vaccine 2006, Vol. 24, Supl 3; Vaccine 2008, Vol. 26, Supl 10; IARC Monographs 2007, Vol. 90*)

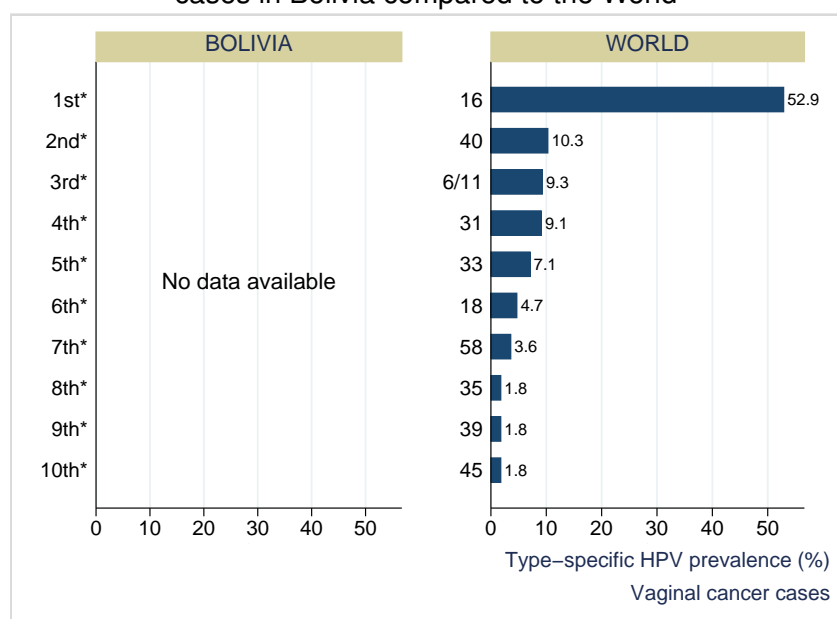
Table 24: Studies on HPV prevalence among cases of vaginal cancer in Bolivia

Study	HPV detection method	Histology	No. tested	HPV prevalence % (95% CI)
No data available	-	-	-	-

Data sources:

Ongoing data are compiled by the HPV Information Centre in the Unit of Infections and Cancer at the Institut Catala d'Oncologia based on the initial meta-analysis conducted by the IARC Infection and Cancer Epidemiology Group in: De Vuyst H, Int J Cancer 2009; 124: 1626.

Figure 29: Ten most frequent HPV types among vaginal cancer cases in Bolivia compared to the World



*Not available. No more types than shown were tested or were positive

Data sources:

Ongoing data are compiled by the HPV Information Centre in the Unit of Infections and Cancer at the Institut Catala d'Oncologia based on the initial meta-analysis conducted by the IARC Infection and Cancer Epidemiology Group in: De Vuyst H, Int J Cancer 2009; 124: 1626.

World: Refer to specific World report or methods document for data sources

4.2.4 Penile cancer

The geographical correlation between the incidence of penile and cervical cancers and the concordance of these two cancers among married couples suggested the common aetiology of HPV infection. HPV DNA is detectable in approximately 40-50% of all penile cancers. HPV DNA is detectable among penile intraepithelial neoplasias with the basaloid histological type, ranging from 75-80% of cases, and decreasing to 30-60% among invasive squamous cell carcinomas (SCC). The majority of penile carcinomas are squamous cell carcinomas (SCC), and it has been observed that some cases of penile SCC are HPV DNA negative. HPV DNA positivity among penile cancers varies with histopathological type, with a prevalence of 47% in basaloid/warty types, 75% in purely basaloid types, and 11% in keratinizing SCC. Among HPV-DNA positive cases, HPV-16 is the most common type. In this section, the HPV burden among cases of penile cancers in Bolivia is presented. (*Vaccine 2006, Vol. 24, Supl 3; Vaccine 2008, Vol. 26, Supl 10; IARC Monographs 2007, Vol. 90*)

Table 25: Studies on HPV prevalence among cases of penile cancer in Bolivia

Study	HPV detection method	No. tested	HPV prevalence % (95% CI)
No data available	-	-	- -

Data sources:

Data have been compiled by the HPV Information Centre in the Unit of Infections and Cancer at the Institut Catala d'Oncologia and have been published as systematic review in: Miralles-Guri C, J Clin Pathol 2009; In press

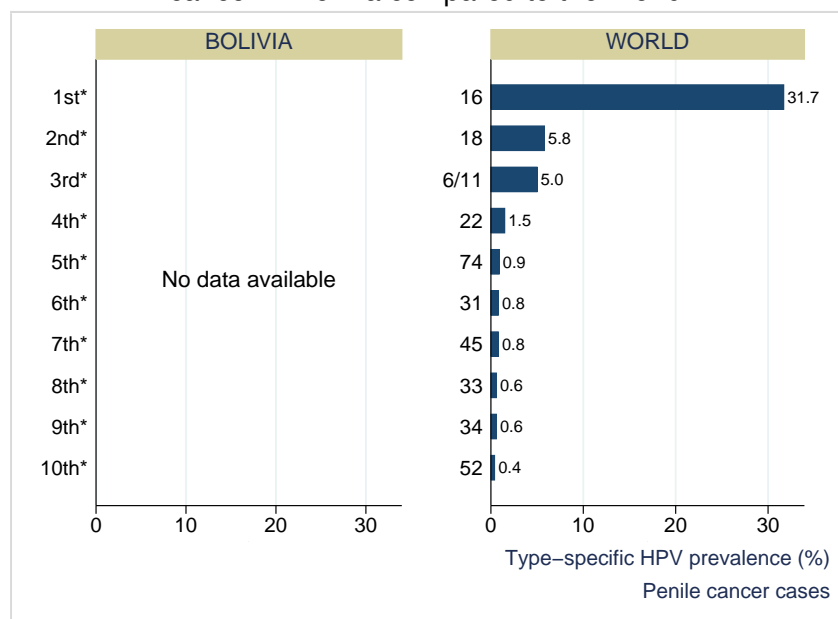
Table 26: Pooled estimate of HPV prevalence among cases of penile cancer by histology in Bolivia

Histology	No. tested	HPV prevalence	
		%	(95% CI)
Any Histology	-	-	-
Verrucous SCC	-	-	-
Non-keratinizing SCC	-	-	-
Carc. In situ	-	-	-
SCC (unspecified)	-	-	-
Warty SCC	-	-	-
Keratinizing SCC	-	-	-
Basaloid SCC	-	-	-

Data sources:

Data have been compiled by the HPV Information Centre in the Unit of Infections and Cancer at the Institut Catala d'Oncologia and have been published as systematic review in: Miralles-Guri C, J Clin Pathol 2009; In press

Figure 30: Ten most frequent HPV types among cases of penile cancer in Bolivia compared to the World



*Not available. No more types than shown were tested or were positive

Data sources:

Data have been compiled by the HPV Information Centre in the Unit of Infections and Cancer at the Institut Catala d'Oncologia and have been published as systematic review in: Miralles-Guri C, J Clin Pathol 2009; In press

World: Refer to specific World report or methods document for data sources

4.3 HPV burden in men

The information to date regarding penile HPV infection is primarily derived from studies that examined husbands of female cervical cancer cases, cross-sectional studies of selected populations such as individuals with sexually transmitted infections (STI) and military recruits, as well as from small prospective studies. HPV infection in the genital tract has been detected in up to 73% of healthy men. Like other STIs, HPV may be transmitted more readily from men to women than from women to men. In this section, the HPV burden among men in Bolivia is presented.

(*Vaccine 2008, Vol. 26, Supl 10*)

Table 27: Studies on HPV prevalence among men in Bolivia

Study	Anatomic sites samples	HPV detection method	Population	Age (years)	HPV prevalence	
					Men tested	% (95% CI)
No data available	-	-	-	-	-	-

Table 28: Studies on high-risk HPV Prevalence among men in Bolivia

Study	Anatomic sites samples	High-risk HPV tested	Population	Age (years)	HPV prevalence	
					Men tested	% (95% CI)
No data available	-	-	-	-	-	-

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; 24S3: S3-1*)

In this section, the prevalence of smoking, parity (fertility), oral contraceptive use, and HIV in Bolivia are presented.

Table 29: Factors contributing to cervical carcinogenesis (cofactors) in Bolivia

INDICATOR		MALE	FEMALE	TOTAL
Smoking¹				
Smoking of any tobacco prevalence (%)	Current	-	-	-
	Daily	16.8 ^a	9.5 ^a	-
Cigarette smoking prevalence (%)	Current	-	-	-
	Daily	16.3 ^a	8.4 ^a	-
Parity^{2,3}				
Total fertility rate per woman		-	4.1 ^b	-
	15-19 yrs	-	97 ^b	-
	20-24 yrs	-	193 ^b	-
Age-specific fertility rate (per 1000 women)	25-29 yrs	-	191 ^b	-
	30-34 yrs	-	156 ^b	-
	35-39 yrs	-	118 ^b	-
	40-44 yrs	-	54 ^b	-
	44-49 yrs	-	15 ^b	-
Hormonal contraception⁴				
Oral contraceptive use (%)		-	-	3.6 ^c
HIV				
Adult (15-49 yrs) prevalence percent [low estimate - high estimate] ⁵		-	-	0.2 [0.1-0.3] ^d
Young adults (15-24 yrs) rate of HIV (%) [low estimate - high estimate] ⁵		0.2 [0.1-0.3] ^d	0.1 [<0.1-0.2] ^d	-
Estimated number of adults and children living with HIV [low estimate - high estimate] ⁵		-	-	8100 [6500-11000] ^d
Estimated number of adults (15+ yrs) living with HIV [low estimate - high estimate] ⁵		-	2200 [1700-2900] ^d	7900 [6300-10000] ^d
Estimated number of AIDS deaths in adults and children [low estimate - high estimate] ⁵		-	-	<500 [<1000] ^d
Estimated antiretroviral therapy coverage (%) [low estimate - high estimate] ^{6,7}		-	-	22% (16%-30%) ^d
Estimated number of people receiving antiretroviral therapy [low estimate - high estimate] ^{6,7}		-	-	<500 (500) ^d
HIV prevalence (%) among female sex workers in the capital city ⁵		-	0.4 ^d	-
HIV prevalence (%) among men who have sex with men in the capital city ⁵		21.5 ^d	-	-

Year of estimation: ^a 2008; ^b 2001; ^c 2003/04; ^d 2007;

² Fertility rate is a proxy measure of parity.

⁶ The coverage estimates are based on the estimated unrounded numbers of people receiving antiretroviral therapy and the estimated unrounded need for antiretroviral therapy (based on UNAIDS/WHO methodology). The ranges in coverage estimates are based on plausibility bounds in the denominator: that is, low and high estimates of need.

Data sources:

¹ WHO Report on the Global Tobacco Epidemic, 2008 - The MPOWER package. Tobacco Free Initiative, World Health Organization, 2008 (http://www.who.int/tobacco/mpower/gtcr_download/en/index.html)

³ World fertility patterns 2007 [wall chart]. New York, Population Division, Department of Economic and Social Affairs, United Nations Secretariat, 2008.

⁴ United Nations, Department of Economic and Social Affairs, Population Division. World Contraceptive Use 2005 (<http://www.un.org/esa/population/publications/contraceptive2005/WCU2005.htm>)

⁵ 2008 Report on the global AIDS epidemic, UNAIDS/WHO, July 2008.

⁷ World Health Organization. WHO and HIV/AIDS. Towards universal access: scaling up priority HIV/AIDS interventions in the health sector: progress report 2008.

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 30: Time of sexual intercourse and high-risk sexual behaviour in Bolivia, for females and males

Indicator	Male ^a	Female
Time of sexual intercourse		
Median age at first sex among young men and women (15-24 years) ¹	17.9	19.4 ^a
Median age at first sexual intercourse among men (25-54 years) and women (25-49 years) ¹	17.3	18.6 ^a
% of young people (15-24 years) who have had sex before the age of 15 ¹	18	6 ^a
Abstinence of never-married young men and women (age 15-24 years) ¹	47	74 ^a
High-risk sexual behaviour		
Extramarital sex in the last year ³	29	13 ^a
Multiple partners in the last year among sexually active respondents aged 15-49 ¹	18	1 ^a
Commercial sex in last year ²	3	-

Year of estimation: ^a 2003;

Data sources:

¹ Bolivia Encuesta Nacional de Demografía y Salud 2003

² Bolivia Encuesta Nacional de Demografía y Salud 2003

The number of male respondents reporting that they paid for sex in the last 12 months. [instead of one direct question, this came from respondents reporting that of their last three sex partners, 0

³ Bolivia Encuesta Nacional de Demografía y Salud 2003

(Numerator): The number of respondents who have had sex with a nonmarital, noncohabiting partner, in the last 12 months. [based on last two partners in last 12 months].

Table 31: Reproductive health indicators in Bolivia

Factor	Indicator	Male	Female	Total	
Age at first marriage ¹	Average age at first marriage:	25.1 ^a	22.7 ^a	-	
	Percentage of ever married	15-19 yrs	3.7 ^a	13.5 ^a	-
		20-24 yrs	36.0 ^a	53.2 ^a	-
		45-49 yrs	94.2 ^a	92.7 ^a	-
	Difference in average at first marriage between men and women	-	-	2.4 ^a	
Married or in union ²	Women aged 15-49 married or in union (thousands)	-	1371 ^b	-	
Contraceptive use ³	Any contraceptive method (%)	-	58.4 ^b	-	
	Annual change (1997 to 2007): any contraceptive method	-	1.5 ^b	-	
	Annual change (1997 to 2007): modern methods	-	1.7 ^b	-	
	Modern methods	Condom (%)	-	3.9 ^b	-
		IUD (%)	-	10.2 ^b	-
		Injectable or implant (%)	-	8.0 ^b	-
		Pill/Oral contraceptive (%)	-	3.6 ^b	-
		Sterilization (%)	0.0 ^b	6.5 ^b	-
		Vaginal barrier method (%)	-	0.2 ^b	-
		Other modern methods (%)	-	2.5 ^b	-
	Traditional methods	Prevalence of modern methods (%)	-	34.9 ^b	-
		With-drawal (%)	-	3.8 ^b	-
Rhythm (%)		-	19.3 ^b	-	
Other traditional methods (%)		-	0.3 ^b	-	

Year of estimation: ^a 1992; ^b 2003/04;

Data sources:

¹ World Bank HNPStats [online database]. Washington DC, World Bank Health, Nutrition and Population (HNP) statistics, 2007 (<http://go.worldbank.org/N2N84RDV00>, accessed 28 Jan 2009).

² United Nations, Department of Economic and Social Affairs, Population Division. World Contraceptive Use 2005 (<http://www.un.org/esa/population/publications/contraceptive2005/WCU2005.htm>)

³ United Nations, Department of Economic and Social Affairs, Population Division. World Contraceptive Use 2007 (<http://www.un.org/esa/population/publications/contraceptive2007/contraceptive2007.htm>)

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. In addition, male circumcision and the use of condoms have shown a significant protective effect against HPV transmission and may offer an alternative preventative strategy. This section presents indicators on basic characteristics and performance of cervical cancer screening, status of HPV vaccine licensure, introduction and country recommendations and the prevalence of male circumcision and condom use in Bolivia.

7.1 Cervical cancer screening practices

Table 32: Main characteristics of cervical cancer screening in Bolivia

Indicator	Value
Screening ages (years)	-
Screening interval (years) or frequency of screens	-
Lifetime number of recommended smears	-
Smear taker	-

Variable screening ages and screening intervals or frequency of screens depend on different guidelines followed in the country.

Data sources:

IARC Handbooks of Cancer Prevention Vol. 10: Cervix Cancer Screening. IARC Press. Lyon, 2005.

Table 33: Estimated coverage of cervical cancer screening in Bolivia

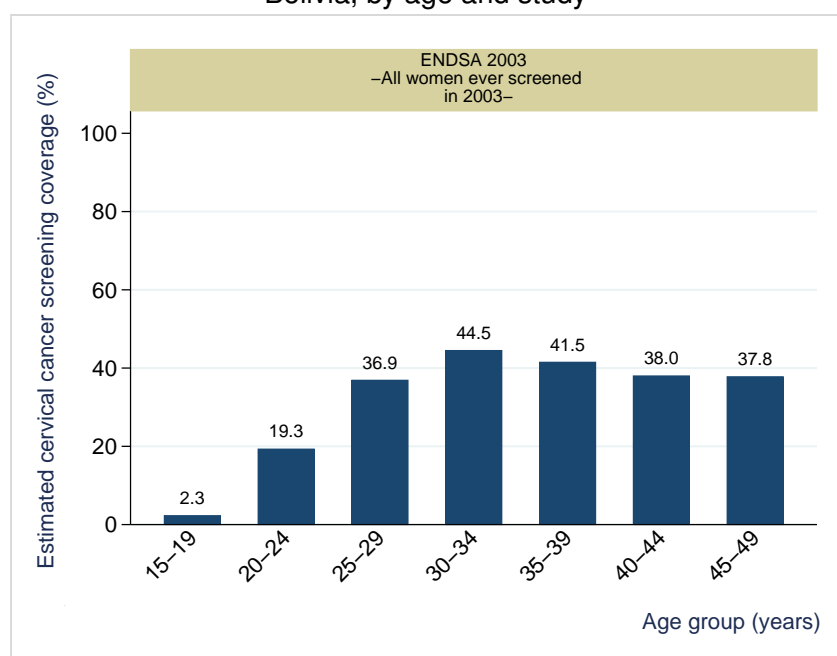
Reference	Year	Population studied	Rural or Urban	N Women	Age range	Coverage (%)	Within the last year(s)
Batista Moliner 2006 ^a	2004	General female population	All	-	25-49	9.0	3y
	2003		All	-	25-49	9.0	3y
	2002		All	-	25-49	9.0	3y
ENDSA 2003 ^b	2003	General female population	All	17654	15-49	28.0	Ever
			Urban	3920	15-49	32.2	Ever
			Rural	1027	15-49	18.7	Ever

Notes and sources:

^a Data based on report of the National Health Information System (Sistema Nacional de Información en Salud, SNIS) of the Ministry of Health and Sports. Batista Moliner R. Situación de Salud Bolivia 2004. Bolivia: Ministerio de Salud y Deportes. Dirección De Planificación y Cooperación externa. Sistema Nacional de Información y Vigilancia Epidemiológica; 2006.

^b Nationally representative sample of 20,000 households and ever-married 18,487 women aged 15-49 years. Ministerio de Salud y Deportes (MSD), Instituto Nacional de Estadística (INE). Bolivia Encuesta Nacional de Demografía y Salud ENDSA 2003. Calverton, USA: Measure DHS; 2004 Nov.

Figure 31: Estimated coverage of cervical cancer screening in Bolivia, by age and study



Notes and sources:

Nationally representative sample of 20,000 households and ever-married 18,487 women aged 15-49 years. Ministerio de Salud y Deportes (MSD), Instituto Nacional de Estadística (INE). Bolivia Encuesta Nacional de Demografía y Salud ENDSA 2003. Calverton, USA: Measure DHS; 2004 Nov.

Table 34: Estimated coverage of cervical cancer screening in Bolivia, by region

Region	N women	Age range	Coverage (%)	LY*	Population	Reference
Beni	-	25-49	4.0	3y	General female population	Batista 2006 ^a Moliner
Beni/Pando	724	15-49	21.4	Ever	General female population	ENDSA 2003 ^b
Chiquisaca	-	25-49	24.0	3y	General female population	Batista 2006 ^a Moliner
Chuquisaca	1160	15-49	31.0	Ever	General female population	ENDSA 2003 ^b
Cochabamba	3353	15-49	30.5	Ever	General female population	ENDSA 2003 ^b
	-	25-49	9.0	3y	General female population	Batista 2006 ^a Moliner
La Paz	4782	15-49	24.6	Ever	General female population	ENDSA 2003 ^b
	-	25-49	10.0	3y	General female population	Batista 2006 ^a Moliner
Oruro	915	15-49	21.8	Ever	General female population	ENDSA 2003 ^b
	-	25-49	5.0	3y	General female population	Batista 2006 ^a Moliner
Pando	-	25-49	9.0	3y	General female population	Batista 2006 ^a Moliner
Potosi	1368	15-49	19.4	Ever	General female population	ENDSA 2003 ^b
	-	25-49	3.0	3y	General female population	Batista 2006 ^a Moliner
Santa Cruz	4488	15-49	33.4	Ever	General female population	ENDSA 2003 ^b
Santa Cruz	-	25-49	8.0	3y	General female population	Batista 2006 ^a Moliner
Tarija	863	15-49	31.3	Ever	General female population	ENDSA 2003 ^b
	-	25-49	10.0	3y	General female population	Batista 2006 ^a Moliner

LY*: Within the last year(s)

Notes and sources:

^a Data based on report of the National Health Information System (Sistema Nacional de Información en Salud, SNIS) of the Ministry of Health and Sports.

Batista Moliner R. Situación de Salud Bolivia 2004. Bolivia: Ministerio de Salud y Deportes. Dirección De Planificación y Cooperación externa. Sistema Nacional de Información y Vigilancia Epidemiológica; 2006.

^b Nationally representative sample of 20,000 households and ever-married 18,487 women aged 15-49 years.

Ministerio de Salud y Deportes (MSD), Instituto Nacional de Estadística (INE). Bolivia Encuesta Nacional de Demografía y Salud ENDSA 2003. Calverton, USA: Measure DHS; 2004 Nov.

7.2 HPV vaccination

7.2.1 HPV vaccine licensure and introduction

Table 35: Licensure status of current HPV vaccines in Bolivia

HPV vaccine	Date	Licensure
Bivalent vaccine/Cervarix	2009	-
Quadrivalent vaccine/Gardasil	2009	Yes

Due to importation, distribution, and other regulatory requirements, as well as price negotiations, a licensed vaccine may not necessarily be marketed in a given country.

Data sources:

Bivalent: GlaxoSmithKline Biologicals, Rixensart, Belgium, March 2009 | Quadrivalent: Merck & Co., Inc., Whitehouse Station, NJ, USA, March 2009

Table 36: HPV vaccine introduction in Bolivia

Indicator	Value
HPV vaccine schedule	-
Introduction in entire or part of the country	-
Comment	-

Data sources:

WHO-UNICEF Joint Reporting Form and WHO Regional offices 2009, WHO Immunization surveillance, assessment, and monitoring (http://www.who.int/immunization_monitoring/data/data_subject/en/index.html)

7.2.2 Country recommendations on the inclusion of HPV vaccines in national immunization programmes

Table 37: Summary of national HPV vaccine recommendations and programmatic aspects in Bolivia

Indicator	Date	Value
Finance mechanism	-	-
Delivery strategy	-	-
Integration of vaccination and cervical cancer screening program	-	-
Announcement date and type; and recommendation committee	-	-
Recommendation for primary target population	-	-
Recommendation for catch-up population	-	-
Recommendation for vaccinating males	-	-
Comments	-	-

7.3 Male circumcision and condom use

Table 38: Prevalence of male circumcision in Bolivia

Reference	Prevalence % (95%CI)	Method
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%.
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%.

Data sources:

Drain PK, BMC Infect Dis 2006; 6: 172 | WHO 2007: Male circumcision: Global trends and determinants of prevalence, safety and acceptability

Table 39: Prevalence of condom use in Bolivia

Indicator	Prevalence %	Year of estimation
Condom use	3.9	2003/04

Data sources:

United Nations, Department of Economic and Social Affairs, Population Division. World Contraceptive Use 2005 (<http://www.un.org/esa/population/publications/contraceptive2007/contraceptive2007.htm>)

8 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/).

8.1 Immunization schedule

Table 40: General immunization schedule in Bolivia

Vaccine	Schedule	Coverage†	Comment
Bacille Calmette-Guérin vaccine	birth	entire	-
Diphtheria and tetanus toxoid with whole cell pertussis, Hib and HepB vaccine	2, 4, 6 months	entire	-
Measles mumps and rubella vaccine	12-23 months	entire	-
Oral polio vaccine	2, 4, 6 months	entire	-
Tetanus and diphtheria toxoid for older children / adults	1st contact; +1, +6 months; +1, +1 year	entire	-
Vitamin A supplementation	6-11 months; 1-4 years	entire	-
Yellow fever vaccine	12-23 months	entire	-

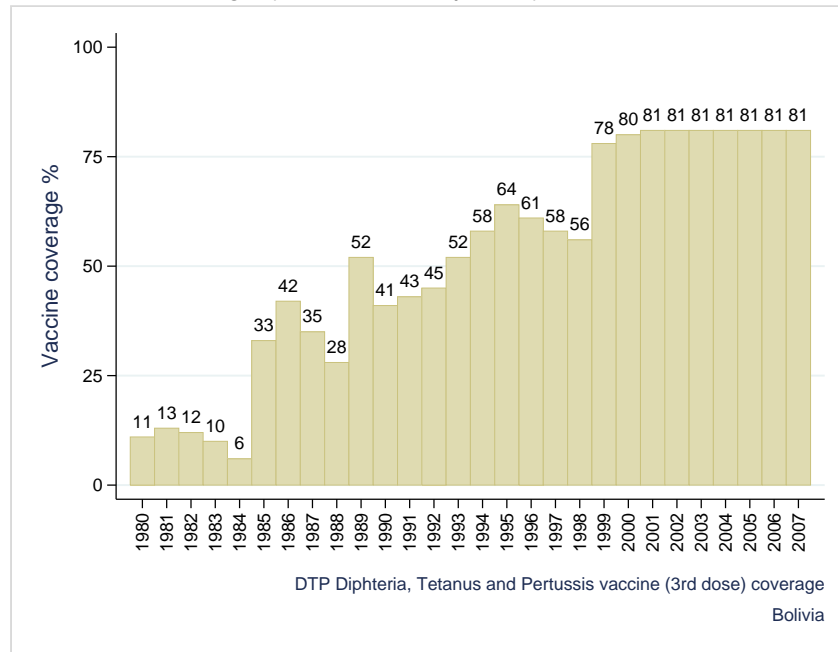
†Entire or part of the population covered.

Notes and sources:

WHO Immunization surveillance, assessment and monitoring (http://www.who.int/immunization_monitoring/data/data_subject/en/)

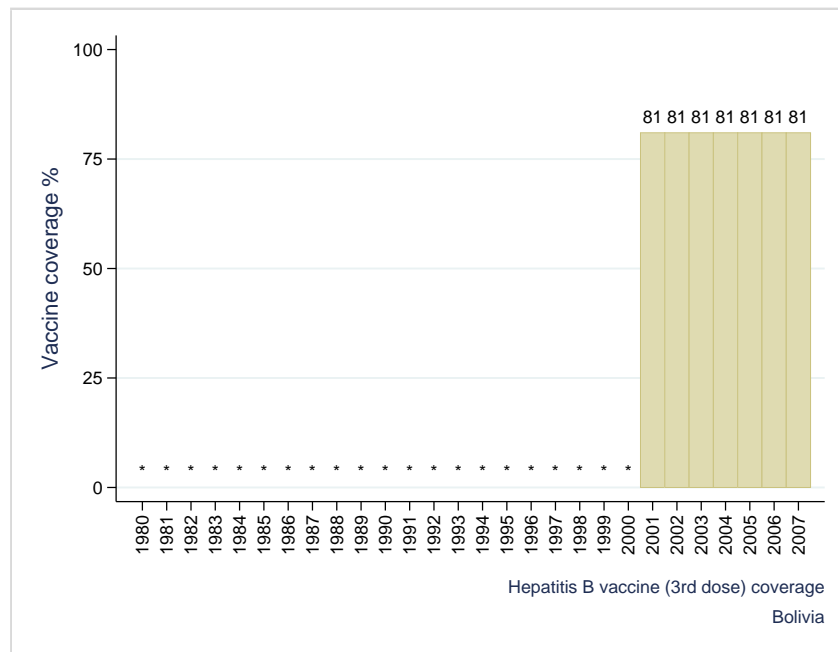
8.2 Immunization coverage estimates

Figure 32: DTP (Diphtheria, Tetanus and Pertussis) vaccine coverage (3rd dose completed) in Bolivia



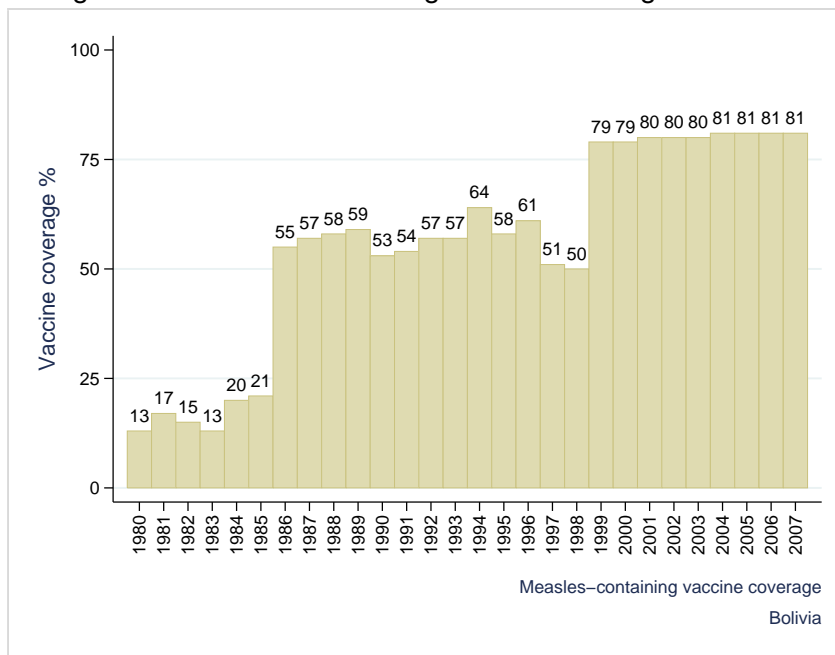
*Data not available
 Data sources: WHO Immunization surveillance, assessment and monitoring (http://www.who.int/immunization_monitoring/data/data_subject/en/)

Figure 33: Hepatitis B vaccine coverage (3rd dose completed) in Bolivia



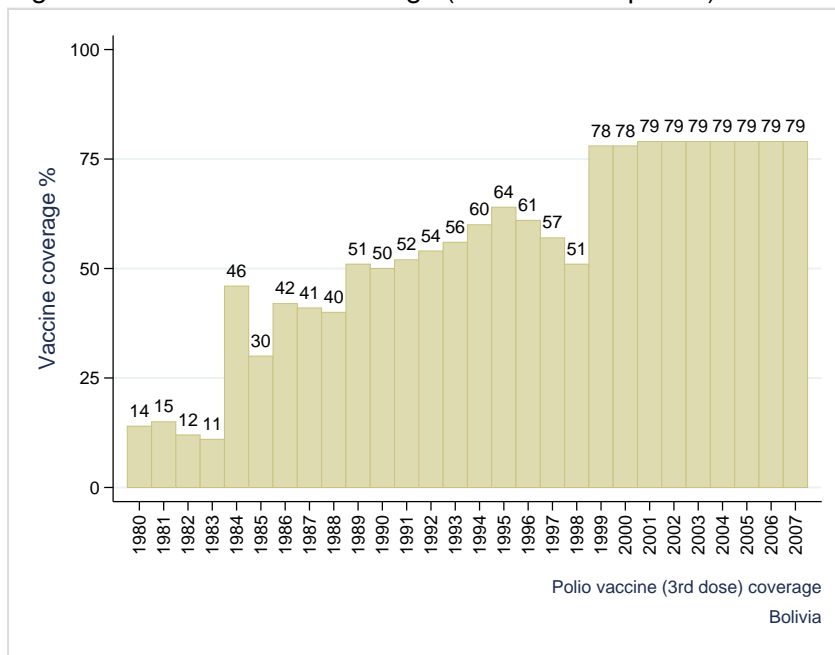
*Data not available
 Data sources: WHO Immunization surveillance, assessment and monitoring (http://www.who.int/immunization_monitoring/data/data_subject/en/)

Figure 34: Measles-containing vaccine coverage in Bolivia



*Data not available
 Data sources: WHO Immunization surveillance, assessment and monitoring (http://www.who.int/immunization_monitoring/data/data_subject/en/)

Figure 35: Polio vaccine coverage (3rd dose completed) in Bolivia



*Data not available
 Data sources: WHO Immunization surveillance, assessment and monitoring (http://www.who.int/immunization_monitoring/data/data_subject/en/)

8.3 Other immunization indicators

Table 41: Relevant indicators of vaccine implementation in Bolivia.

Indicator		Value ^a
Immunization planning and management	Does the country have a multi-year plan (MYP) for immunization?	Yes
	What years does the MYP cover?	-
	Is MYP costing included?	Yes
	Is the MYP for immunization integrated into the broader health sector plan?	Yes
	Year of last inventory (models: location; age and working status) of all refrigeration equipment assigned for public immunization services in the country	2007
Immunization system performance	Total number of districts in country	327
	% of districts \geq 80% DTP3 coverage	54
	Drop-out rate between DTP1 and DTP3 coverage	3.66
Surveillance	Is there a system in place, with laboratory confirmation, to measure the impact of vaccination against invasive bacterial diseases, for example bacterial meningitis or pneumonia?	Yes
Safety	Non AD disposables: Type of injection equipment used for routine immunizations	Yes
	Sterilizable: Type of injection equipment used for routine immunizations	No
	Are safety boxes distributed with all vaccine deliveries?	Yes
	Was there any monitoring for immunization safety (i.e. monitoring of adverse events following immunization)?	Yes
Finance	Was there any monitoring for immunization safety (i.e. monitoring of adverse events following immunization)?	Yes
	What percentage of routine vaccine costs was financed by the government (including loans)?	100
	Was there a line item in the national budget for purchase of injection supplies (syringes: needles, sharp boxes) for routine immunizations?	Yes
	% of immunization spending financed using Government funds	86.8
New vaccine introduction	Is Hepatitis B vaccine integrated into the routine immunization systems?	Yes
	Is Rubella vaccine integrated into the routine immunization systems?	Yes

^a 'A' means Adolescents, 'E' means Estimates and 'P' means Partial.

Reported for year: ^a 2007;

Data sources:

WHO Immunization surveillance, assessment and monitoring (http://www.who.int/immunization_monitoring/data/data_subject/en/)

Note to the reader

Anyone who is aware of relevant published data that may not have been included in the WHO/ICO Information Centre on HPV and Cervical Cancer 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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