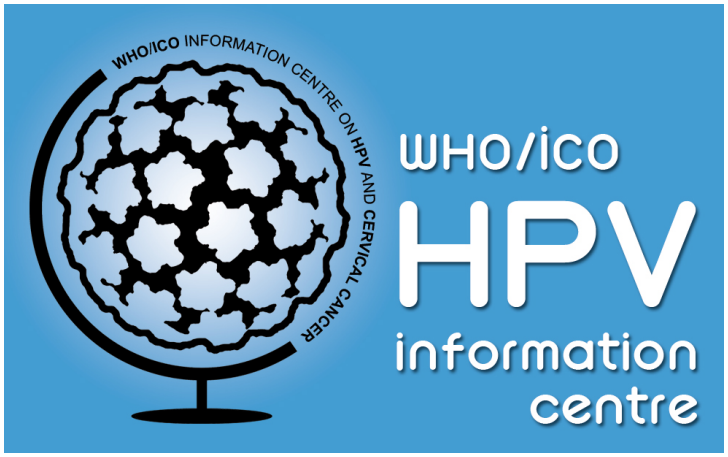

Human Papillomavirus (HPV) and Related Cancers in the Global Alliance for Vaccines and Immunization (GAVI) Countries. A WHO/ICO HPV Information Centre Report

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Contents

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Preface

The path to eliminate cervical cancer in the world and the challenges of professional education

Cervical cancer remains a major public health priority. In at least one-third of the countries worldwide, in which all GAVI countries are included, cervical cancer is the most common cancer in women and for women below the age of 45, cervical cancer is one of the three leading cancers. The economic and social disparities in cervical cancer prevention and treatment are staggering and strongly reflect the limitations for women in developing nations, to access basic preventative options.

Success in basic and clinical research has expanded the possibilities of cervical cancer prevention by introducing human papillomavirus (HPV) testing as part of the screening technology and most importantly, by making available remarkably efficacious prophylactic HPV vaccines. Understanding the nature of these tools, how to use them and how to evaluate their impact is a pressing social demand for the scientific, medical and public health communities. Because cervical cancer prevention encompasses a range of complex topics and public health disciplines globally, the need to present the information in a comprehensive and unbiased manner becomes a critical task.

The WHO / ICO HPV Information Centre and the "ICO Monograph Series on HPV and Disease Prevention"

To respond to this need, since 2004, the Catalan Institute of Oncology (ICO) has worked in close collaboration with the World Health Organization (WHO) to organize the HPV and Cancer Information Centre (www.who.int/hpvcentre), a web-based resource to compile, edit and disseminate scientific data on HPV and related cancers. With the generous contribution of the international HPV scientific community, the project also launched a series of international reviews published as scientific monographs and regional reports (Vaccine, Vol 24 Suppl. 3, 2006) and in 2007, the WHO/ICO Information Centre published an international compilation of HPV and cervical cancer statistics (Vaccine, Vol 25, Suppl. 3, 2007) for each one of the 192 countries in the world. In 2008, the project presented three volumes, which provided an updated overview of progress in the research field, expanded understanding of the infection and disease spectrum, and gave information on the technical developments for the prevention of HPV-related diseases (general section, Vaccine, Vol 26, Suppl. 10, 2008). The general section was accompanied by two region-specic reports focusing on the Latin America and Caribbean region (Vaccine, Vol 26, Suppl. 11, 2008) and the Asia Pacific region (Vaccine, Vol 26, Suppl. 12, 2008). These regional reports are available in English, Spanish, Chinese and Japanese languages and represent a major collaborative effort between the local and international scientific communities.

The project is now presenting the third update of the general chapters describing scientific advances in the field (Vaccine, Vol 30, Suppl. 5, 2012) and four regional reports addressing the Central and Eastern European and central Asia countries (Vaccine, Vol 31, Suppl. 2, 2013), the Northern Africa and Middle Eastern countries (Vaccine, Vol 31, Suppl. 1, 2013), Israel (Vaccine, Vol 31, Suppl. 4, 2013) and the Sub Saharan African regions (Vaccine, Vol 31, Suppl. 3, 2013).

Finally, in this issue, we present a special report of the WHO/ICO Information Centre on the statistics of HPV and cancer prevention for the GAVI countries (Vaccine, Vol 30, Suppl. 4, 2012). This summary report provides key information for the 72 GAVI countries (56 GAVI-eligible and 16 GAVI-graduating ones) on the burden of 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 indicators.

Other educational initiatives

In order to maximize the impact of the reviews and the publications, two other initiatives are being developed. One is to facilitate access to the widest possible audiences, including free distribution of the printed materials to scientific societies and major conferences. Under the WHO HINARI international agreement, the e-version of all Monographs and reports are freely available for those countries included in the agreement.

The second initiative is to produce a web-based e-learning educational platform based on an existing program and platform at ICO (www.e-oncologia.org). In 2011, a 10-hour course on cervical cancer epidemiology and prevention was launched in close collaboration with the educational branch at the International Federation of Gynecology and Obstetrics (FIGO), the International Agency for Research on Cancer (IARC), the International Union Against Cancer (UICC), the WHO and the International Atomic Energy Agency (IAEA) (courseccp@iconcologia.net). By early 2012, over 4000 participants have already taken the course. The course is currently offered free of charge in Spanish, English French and Russian.

Prospects of cervical cancer control and eradication

In the years ahead, we should witness major efforts in the distribution of HPV vaccines to pre-adolescent girls, adolescent girls and young women, and eventually to men. Considerable effort will also be devoted to the development of sustainable screening protocols in developed and developing countries. Promising scenarios now involve the GAVI countries with the announcement in 2011 that the GAVI Alliance supports HPV vaccines in the world's poorest countries. The purpose of this monograph series is to contribute accurate, unbiased and comprehensive information to medical and public health communities worldwide. It is a scientific response to a unique opportunity in the common pursuit of reducing the impact of cancer globally. We sincerely hope the readers will recognize the effort and enjoy the work.

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Foreword

In January 2000, the Global Alliance for Vaccines and Immunization (GAVI) was launched to address the need to increase immunization coverage and to fund vaccines for children in the world's poorest countries.

GAVI is a global public-private partnership. It brings together developing country and donor governments, WHO, UNICEF, the World Bank, the vaccine industry in both industrialised and developing countries, research and technical agencies, civil society organisations, the Bill & Melinda Gates Foundation and other private philanthropists. This has brought a single-minded focus to the task of reaching the 19.3 million unvaccinated children worldwide. By the end of 2011, GAVI had supported the immunization of 326 million additional children, who might not otherwise have had access to vaccines, and prevented over five million future deaths.

GAVI's mission, to save children's lives and protect people's health by increasing access to immunization in poor countries, recognises the priority of reducing childhood deaths due to vaccine preventable diseases, and the importance of bridging the equity gap between the introduction of new vaccines in high- and low-income countries.

HPV vaccines have been part of routine immunization programmes in many wealthier countries since 2007. However, although 88% of the 275,000 women who die of cervical cancer every year lived in low-income countries, HPV vaccines have yet to be introduced where they are needed most.

In 2008, the GAVI Alliance Board prioritised support for HPV vaccines as part of its vaccine investment strategy which identified vaccines that would have the biggest impact on the disease burden in developing countries. However due to financial constraints at the time of the Board decision, GAVI was unable to provide support until November 2011 when the Board agreed to invite countries to apply for funding for HPV vaccines provided that GAVI secure an acceptable price commitment from industry and countries demonstrate the ability to deliver HPV vaccines nationally to the new target population of adolescent girls or develop demonstration projects.

In introducing HPV vaccines, GAVI Alliance continues to prioritise women's health. This requires a new way of working at both global and country levels, with multiple stakeholders and new partnerships. It requires active engagement of reproductive health, adolescent health and cancer prevention and control programmes in addition to the immunization community, and represents a significant opportunity for increased synergies.

This report is very timely and can serve as a reference for all countries in assessing their burden of HPV and related cancers including cervical cancer. The fact that it brings together national level data for all GAVI countries makes it an invaluable resource and a first step in documenting HPV-related disease data in these countries.

We would like to thank the HPV Information Centre at the Catalan Institute of Oncology for taking the initiative for the Report which we believe will be of use to GAVI countries to support an evidenced-based approach to developing appropriate interventions and advocacy strategies to support the fight against HPV, cervical and other related cancers.

Nina Schwalbe
Managing Director
Policy and Performance
GAVI Secretariat

Executive summary

In November 2011, the GAVI Alliance announced the decision to support Human Papillomavirus (HPV) vaccines in the world's poorest countries. This summary report provides key information for the 72 GAVI countries (56 GAVI-eligible and 16 GAVI-graduating ones) on the burden of cervical cancer, burden of 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 indicators. The report is intended to strengthen the guidance for health policy implementation of cervical cancer prevention strategies in GAVI countries.

There are 3,082 million people living in GAVI countries (44% of the world population), and 1,021 million are women at risk of developing cervical cancer (women aged 15 years and older). This number is projected to increase to 2,468 million (53% of the worldwide population) by 2050.

Current estimates indicate that, every year, 282,711 women are diagnosed with cervical cancer in GAVI countries (53% of the annual number of new cases worldwide) and 163,333 women die from cervical cancer (59% of the annual number of deaths worldwide). Based on crude rates, cervical cancer is the 1st and 3rd cause of female cancer in GAVI-eligible and GAVI-graduating countries, respectively, and ranks as the 1st and 4th cause of female cancer death, respectively.

Only due to population growth, projected global estimates of cervical cancer are expected to rise to 720,415 new cases and 394,905 deaths in 2025. A marked increase has been predicted specifically in GAVI-eligible countries, with a 58% expected increase in the number of new cases and a 63% expected increase in the number of related deaths.

Genital HPV infection is one of the most common sexually transmitted infections (STIs). In GAVI countries, about 11.5% of women with normal cytological findings are estimated to harbour detectable HPV infection at a given time, and close to 70% of invasive cervical cancers are attributed to HPV16 and 18. The 8 most common HPV types in invasive cervical cancer in GAVI countries are HPV16, 18, 45, 33, 35, 52, 31 and 51.

Key statistics in the World and in GAVI countries

Population	WORLD	GAVI COUNTRIES
Women at risk for cervical cancer (aged >= 15 years) in millions	2,562.00	1,020.85
Burden of cervical cancer (CC)*		
Annual number of new cases	530,232	282,711
Annual number of deaths	275,008	163,333
Projected number of new CC cases in 2025	720,415	438,051
Projected number of CC deaths in 2025	394,905	262,760
HPV-related cancer		
HPV prevalence (%) in the general population (women with normal cytology)	11.4	11.5
Prevalence (%) of HPV16 and/or HPV18 in women with:		
Normal cytology	3.8	5.5
Low-grade cervical lesions (LSIL/CIN1)	24.3	19.9
High-grade cervical lesions (HSIL/ CIN2 / CIN3 /CIS)	51.1	39.9
Cervical cancer	70.9	73.8

* Rates per 100,000 women per year; LSIL, low-grade intraepithelial lesions; HSIL, high-grade intraepithelial lesions; CIN cervical intraepithelial neoplasia; CIS, carcinoma in-situ. 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.

Introduction

With the advent of the announcement by the GAVI Alliance Board to support Human Papillomavirus (HPV) vaccines in the world's poorest countries, the WHO/ICO Information Centre on HPV and Cancer (HPV Information Centre) aims to summarize the data available on HPV and HPV-related cancers. This can help to fully evaluate the burden of disease in GAVI countries and to facilitate stakeholders and relevant bodies of decision makers to formulate recommendations on the prevention of cervical cancer and other HPV-related cancers. Data include relevant cancer statistic estimates, epidemiological determinants of cervical cancer, such as demographics, information on country specific risk factors such as proportion of young women who have sex before age of 15 years, use of oral contraceptives, prevalence of smoking, prevalence of Human Immunodeficiency Virus (HIV), prevalence of circumcision and of condom use, burden of HPV infection in women and men, and country-based cervical screening and immunization practices. The report is structured into the following sections:

Section 1 summarizes the mission, policy and strategy of the GAVI Alliance.

Section 2 summarizes the socio-demographic profile of the world and each GAVI country. Detailed explanation of the world division is given in Annex 1.

Section 3 describes the current burden of invasive cervical cancer and other HPV-related cancers in the world and each GAVI country with estimates of incidence and mortality rates.

Section 4 reports on prevalence of HPV and HPV type-specific distribution, in the world and each GAVI country, 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) is 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 presents sexual and reproductive 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 demonstrations programs conducted by PATH and the prevalence of male circumcision and condom use.

1 GAVI Alliance

As explained in the GAVI Alliance website (http://www.gavialliance.org), the Global Alliance for Vaccines and Immunization (GAVI Alliance) was established in 1999 as an alliance of countries and major partners committed to save children's lives and protecting people health by increasing access to immunization in the world's poorest countries.

In November 2011 the GAVI Alliance Board announced the decision to support Human Papillomavirus (HPV) vaccines in the world's poorest countries. This means that up to two million women and girls could be protected from cervical cancer by 2015 (*GAVI Alliance Press Releases 2011*). HPV vaccine, which has direct benefits for women, was prioritized for future investment in 2008 but due to financial constraints, GAVI was unable to offer support immediately. In the meantime, GAVI has been working with manufacturers on strategies to lower vaccine prices to make them more affordable to developing countries. As a result, in June 2011, Merck & Co announced that it would provide its HPV vaccine at U$5 per dose to GAVI, a 67% reduction in the current lowest public price (*GAVI Alliance HPV vaccine support*). The 2009 World Health Organization (WHO) recommendation on HPV vaccines cites that nationwide introduction of the vaccine would be cost-effective in low-income and middle-income countries if the cost per vaccinated girl is less than U$10-25. At U$10 per vaccinated girl, vaccination would be cost-effective in all GAVI-eligible countries (*GAVI Alliance The Evidence Base 2011, Goldie et al. 2008*).

Cervical cancer is the second biggest cancer killer of women in the developing world. WHO recommends the routine use of HPV vaccines in girls aged 9-13 years through national immunization programs (*WHO HPV Position Paper 2009*). New vaccines that prevent the cancer's primary cause, persistent infection by HPV, became available in 2006 and have been rapidly adopted in many high-income countries; however, they are yet to reach women in low-income countries where incidence and mortality rates are much higher. The price of HPV vaccine has been a major barrier to routine use worldwide. From now on, GAVI eligible countries will be able to apply for GAVI support. Countries whose applications are successful will have to provide some co-financing for the vaccine, but this can be just U$0.20 per dose (*GAVI Alliance Press Releases 2011*).

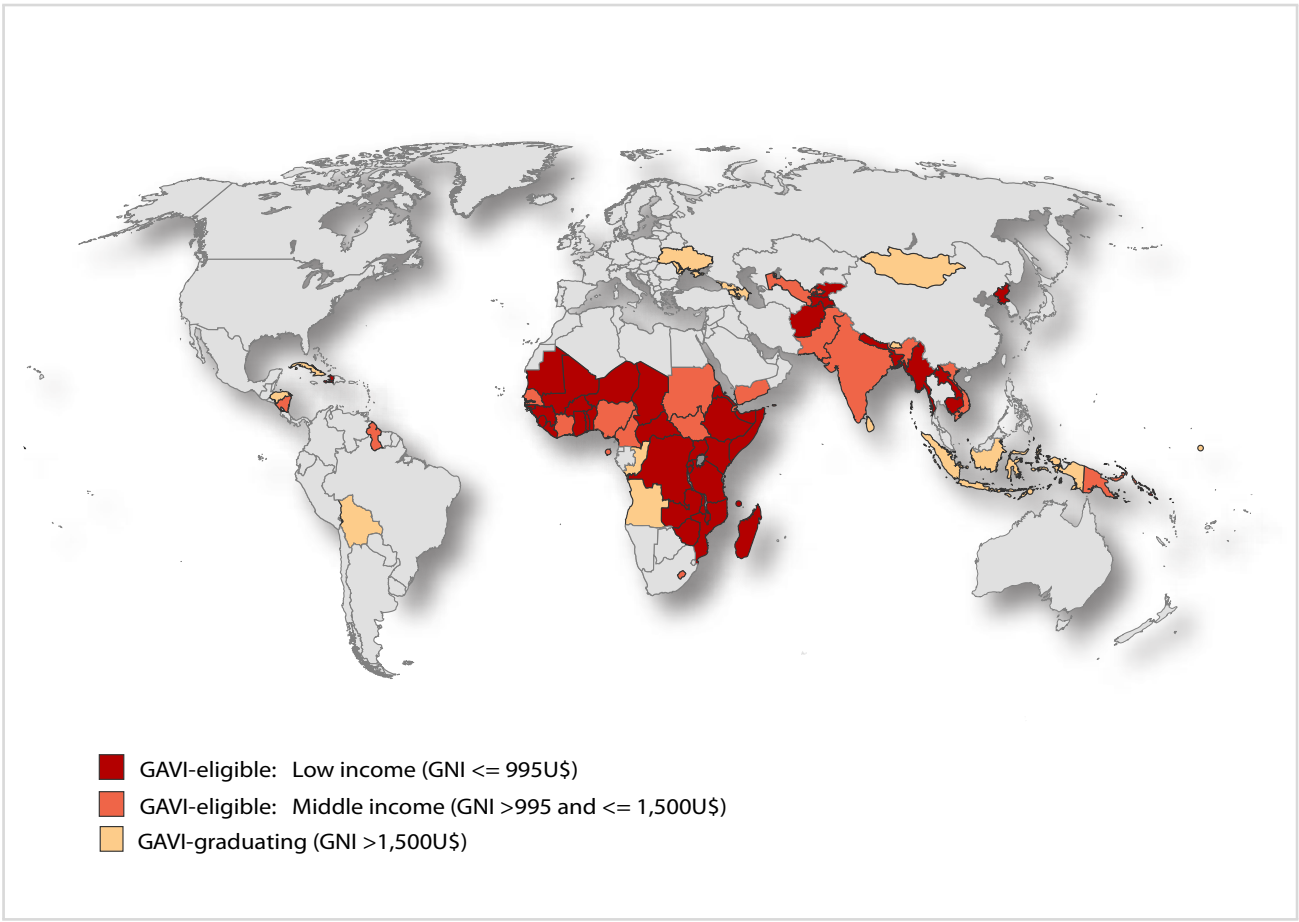
In its first 10 years, the GAVI Alliance has achieved remarkable results. GAVI's impact on public health extends beyond immunization statistics as significant new resources have been attracted to immunization. In recent years, with the support of the GAVI Alliance, low-income countries have begun to fill some of the critical gaps in their immunization schedules and the delay that historically characterizes new vaccine introduction in low-income countries is being reduced. All of these interventions are having a visible impact on disease prevalence and have resulted in a marked reduction in vaccine-preventable mortality. By the end 2010, GAVI has already prevented 5 million future deaths caused by hepatitis B, *Haemophilus influenzae type b* (Hib), measles, pertussis, pneumococcal disease, polio, rotavirus diarrhoea and yellow fever, supporting the immunization of 288 million additional children (otherwise not vaccinated) and pushing global immunization coverage to its highest level in history (*GAVI Alliance Progress Report 2010*).

GAVI has a track record as an effective, efficient and innovative model for development. The GAVI Alliance supports immunization at a global level by providing funds for strengthening of infrastructure, introduction of new and underutilized vaccines and provision of safe injections. All GAVI-supported vaccines are cost-effective, even the new ones, according to the WHO standard classifications, and also when compared with many other interventions (*WHO-CHOICE*). The Alliance is also changing the dynamics of the vaccine market in favour of low-income countries. The growth in predictable demand from low-income countries and the new funds mobilized for immunization has created the sustainable market required to attract manufacturers, stimulate competition and start to drive down prices (*GAVI Alliance The Evidence Base 2011, GAVI Alliance Progress Report 2010*).

GAVI supports the world's poorest countries, which globally suffer the highest burden of vaccine-preventable diseases. In 2009, the GAVI Alliance Board approved a revised eligibility policy that took effect on 1 January 2011 and set the eligibility threshold at a Gross National Income (GNI) per capita level of U$1,500 (according to 2009 World Bank data published in 2010). There are currently 56 GAVI-eligible countries and 16 more countries graduating from GAVI support in 2011 (their GNI per capita exceeds the new eligibility threshold of U$1,500 but they have a final opportunity in 2011 to apply for GAVI support) (*GAVI Alliance Types of Support 2011*) (Figure 1).

By 2011-2015, GAVI has the potential to immunize 243 million children and avert an additional 3.9 million future deaths. In just 5 years, this would nearly double the number of lifes saved in its first decade, representing a major acceleration of GAVI's impact and contributing significantly to the achievement of the Millennium Development Goals (*GAVI Alliance The Evidence Base 2011, GAVI Alliance Progress Report 2010*).

Figure 1: GAVI-eligible and GAVI-graduating countries according to GNI



Data sources: GAVI Alliance 2011 (GNI per capita 2009, US dollars, Washington, DC, World Bank, 2010).
GAVI-graduating countries are those countries with GNI per capita exceeding the eligibility threshold of U$ 1,500 but that have a final opportunity in 2011 to apply for GAVI support.

2 Demographic factors

KEY STATS

2,696 million people live in **GAVI-eligible countries**.

874 million are **women aged 15 and older** who are at risk of cervical cancer.

70% of population is **less than 35 years** old in GAVI-eligible countries.

2,468 million women are projected to live **in GAVI countries by 2050, 53%** of women population worldwide.

The current world population is close to 7,000 million people, with more than 5,700 million living in less developed countries (82%) and 2,696 million living in GAVI-eligible countries (39%) (Table 1). Most of the population of GAVI-eligible countries is from South Central Asia (1,764 million, 46%, 7% and 6% from India, Pakistan and Bangladesh respectively) and from Sub-Saharan Africa (856 million, 32%). To a lesser extent, GAVI-graduating countries include 386 million people, 63% only from Indonesia. Specific population estimates for 2011 in each GAVI country are provided in Annex 2. Contribution of each GAVI country to the total population in GAVI-eligible and GAVI-graduating countries is given in Figure 2.

Country- or region-specific population pyramids illustrate age and sex structure as well as population dynamics. Less developed regions present an expanding pyramid which reflects high birth and death rates and short life expectancy (Figure 3). More developed regions usually show a contracting pyramid indicating low birth and death rates and long life expectancy.

These differences are especially marked in GAVI countries, and mainly in GAVI-eligible ones. The wide pyramid base indicates a large number of children, and the steady upwards narrowing shows that more people die at each higher age group. This situation is especially remarkable in African countries. More than 70% people are less than 35 years of age in GAVI-eligible countries, 35% less than 15 years, and only 4% older than 65 years. It must be noted that figures are highly influenced by the population structure of India, Pakistan, Nigeria, Bangladesh and Indonesia.

The female population worldwide by 2011 is close to 3,457 million and is projected to reach 4,639 million by the middle of this century. Almost all of this increase is projected to come from less developed countries. The female population in less developed regions was estimated at 2,820 million by 2011 and with a tendency to grow annually, and is expected to reach 3,972 million by 2050. By 2011, 1,326 million women were living in GAVI-eligible countries and 196 million women were living in GAVI-graduating ones. Future population projections indicate that over the next 40 years, almost 86% of the female population will live in less developed regions. The female population living in current GAVI-eligible countries will increase from 38% in 2011 to 48% by 2050.

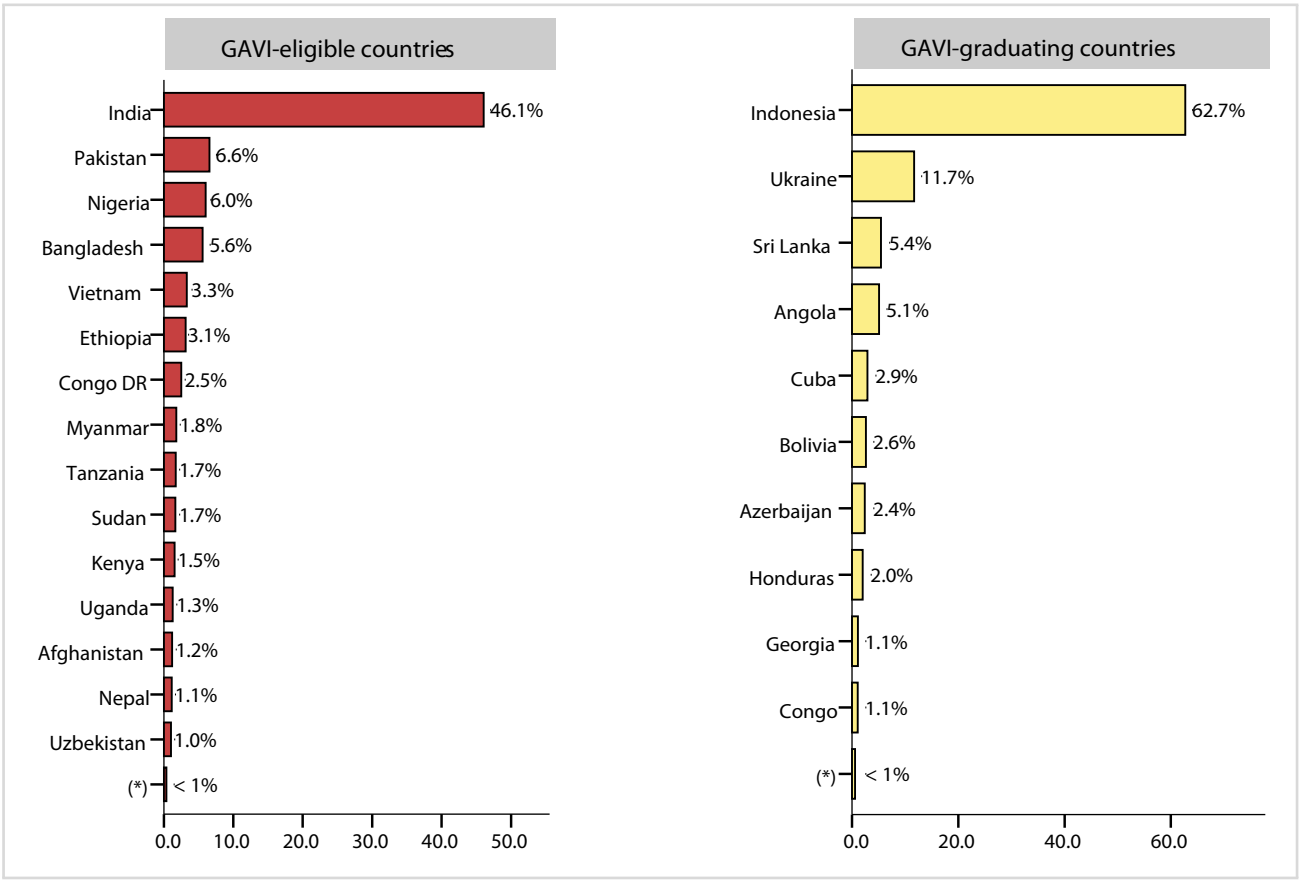
Ageing of the global population is also projected to occur by 2050 (Figure 4). In current GAVI-eligible and GAVI-graduating countries, women aged 10-24 are expected to decline from 30% and 25%, respectively, in 2011 to 23% and 18%, respectively, by 2050 (Figure 5).

Table 1: Population (in millions) estimates for 2011 of the World, Less and More developed regions and GAVI countries

	Female			Male		
	10-14 years	15+ years	Total	10-14 years	15+ years	Total
World	290.28	2562.00	3456.78	311.20	2558.55	3517.26
Less developed regions	257.93	2024.65	2819.50	277.19	2060.62	2914.16
More developed regions	32.35	537.35	637.28	34.01	497.93	603.10
GAVI-eligible Countries (56 countries)	141.13	874.38	1325.75	149.03	893.84	1369.82
GAVI-graduating Countries (16 countries)	15.86	146.47	195.91	16.45	139.06	190.48

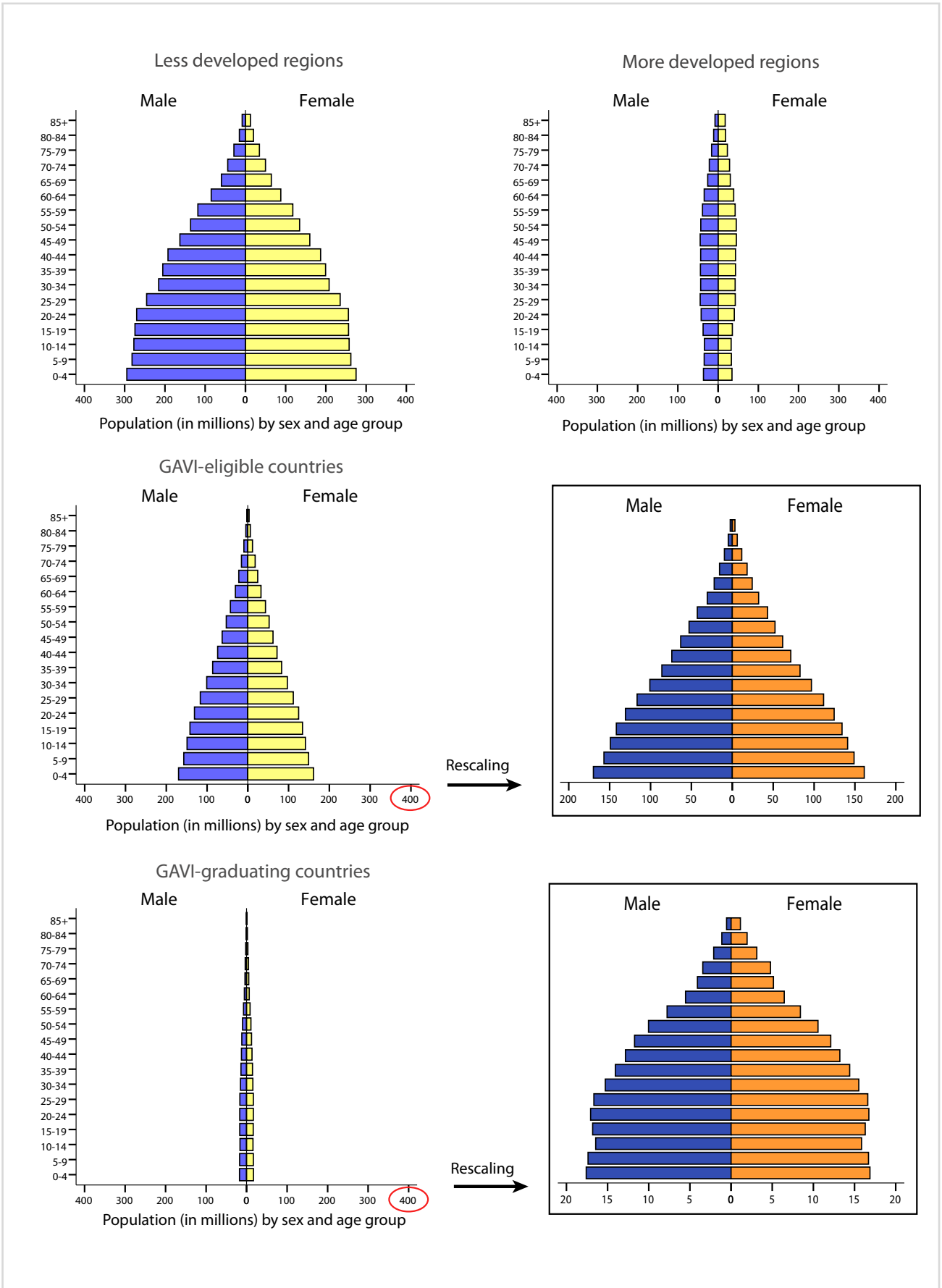
Population in millions.
GAVI-eligible countries: GNI per capita <= 1,500U$; GAVI-graduating countries: GNI per capita > 1,500U$ but they have a final opportunity in 2011 to apply for GAVI support.
Data sources: World population prospects 2011.

Figure 2: Contribution of each GAVI country to the total population in GAVI-eligible and GAVI-graduating countries (by 2011)



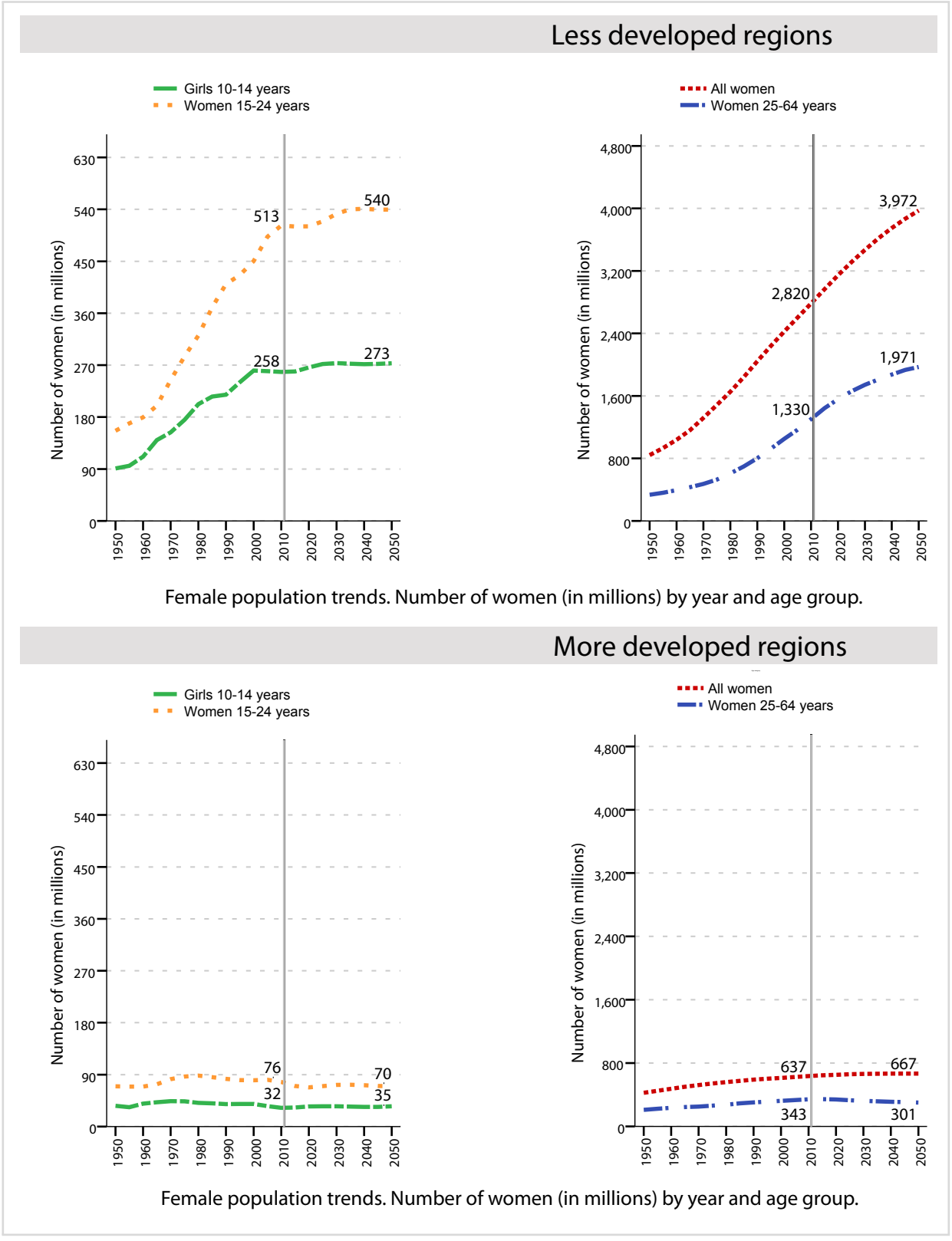
Country population as a percentage of the total population in GAVI-eligible or GAVI-graduating countries.
* Countries contributing with less than 1% to the total population in GAVI-eligible and GAVI-graduating countries.
GAVI-eligible countries: GNI per capita <= 1,500U$; GAVI-graduating countries: GNI per capita > 1,500U$ but they have a final opportunity in 2011 to apply for GAVI support.
Data sources: World population prospects 2011.

Figure 3: Population pyramid (in millions) estimates for 2011 in Less and More developed regions, GAVI-eligible and GAVI-graduating countries



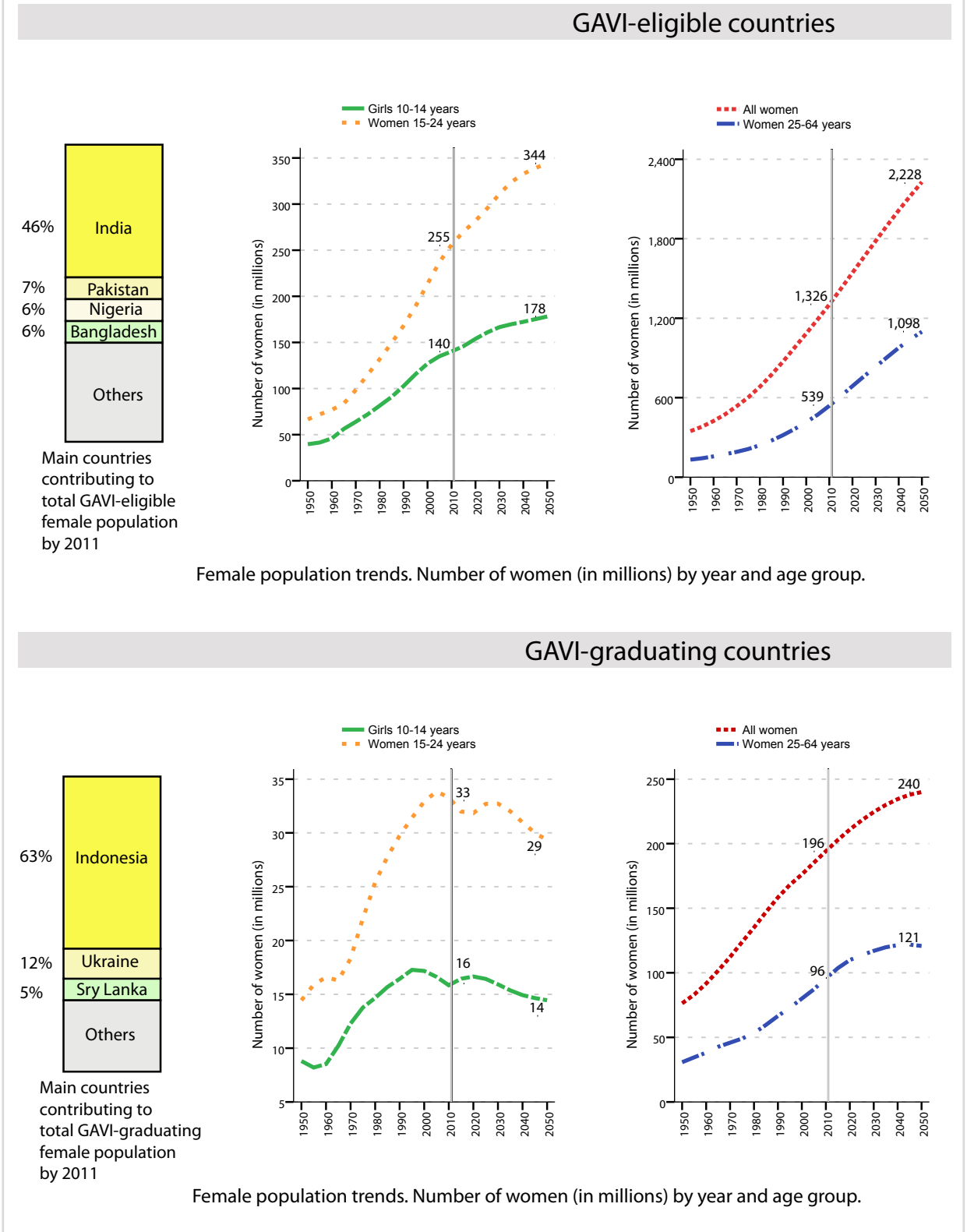
Population in millions.
GAVI-eligible countries: GNI per capita <= 1,500U$; GAVI-graduating countries: GNI per capita > 1,500U$ but they have a final opportunity in 2011 to apply for GAVI support.
Data sources: World population prospects 2011.

Figure 4: Estimated population trends of four selected age groups of women in 2011 Less and More developed regions



Population in millions.
Data sources: World population prospects 2011.

Figure 5: Estimated population trends of four selected age groups of women in 2011 GAVI-eligible and GAVI-graduating countries



Population in millions.
GAVI-eligible countries: GNI per capita <= 1,500U$; GAVI-graduating countries: GNI per capita > 1,500U$ but they have a final opportunity in 2011 to apply for GAVI support.
Data sources: World population prospects 2011.

3 Burden of HPV related cancers

3.1 Cervical cancer

This section describes the current burden of invasive cervical cancer in the world, more developed and less developed regions and specifically in GAVI countries, with estimates of annual number of new cases, deaths, and incidence and mortality rates.

Details on methodological aspects are provided in Annex 3.

3.1.1 Incidence

KEY STATS

530,232 new cervical cancer cases are diagnosed **annually** worldwide.

254,374 cases are **from GAVI-eligible countries** (48%).

Cervical cancer is the **leading cause** of female cancer **in GAVI-eligible countries**.

Age-standardized incidence rates in GAVI-eligible countries are **3-fold higher** than in more developed regions and 1.5-fold higher than in less developed ones.

Cervical cancer **peak incidence in GAVI-eligible countries** is observed in **women aged 60-64 years**, with estimated rates of 90 cases per 100,000 women aged 60-64 years, **5-fold higher** than in more developed regions estimates for this age group.

Cervical cancer is the third most common cancer among women worldwide, with 530,232 new cases diagnosed in 2008 (9% of all female cancers). About 86% of the global cervical cancer burden occurs in less developed regions, representing 13% of all female cancers.

It should also be emphasized that the risk of women getting cervical cancer before age 75 in GAVI-eligible countries is 3-fold and 1.5-fold higher than in more developed and in less developed regions, respectively. In GAVI-graduating countries, the risk is 1.5-fold higher than in less developed regions (Table 2).

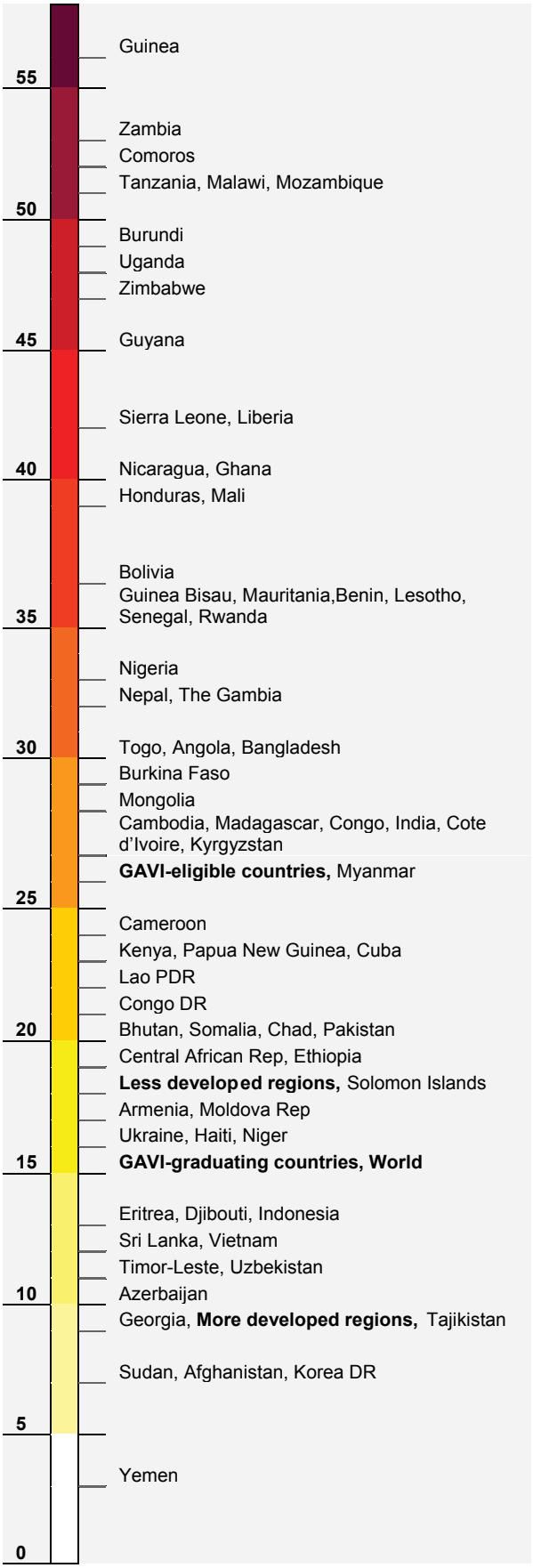
Specific incidence rates for each GAVI country are given in Figure 6 and Annex 4 and specific ranking for each GAVI country can be found in Figure 7.

Table 2: Incidence of cervical cancer in the World, Less and More developed regions and GAVI countries

	N cases	Crude Rate	ASR*	Cum risk* by age 75	Ranking†	
					All women	Women 15-44 yrs
World	530,232	15.8	15.3	1.6	3rd	2nd
Less developed regions	453,531	16.7	17.8	1.9	2nd	2nd
More developed regions	76,701	12.1	9.1	0.9	10th	3rd
GAVI-eligible countries (56 countries)	254,374	20.0	25.9	2.8	1st	2nd
GAVI-graduating countries (16 countries)	28,337	15.2	14.5	1.5	3rd	2nd

* ASR: Age-standardized rate; Cum. risk: Cumulative risk.
Rates per 100,000 women per year. Standardized rates have been estimated using the direct method and the World population as the reference.
†Ranking of cervical cancer incidence to other cancers among all women and women aged 15-44 years according to highest incidence rates (ranking 1st). Ranking is based on crude incidence rates (actual number of cervical cancer cases) in the country/region. Ranking using ASR may differ.
GAVI-eligible countries: GNI per capita <= 1,500U$; GAVI-graduating countries: GNI per capita > 1,500U$ but they have a final opportunity in 2011 to apply for GAVI support.
Data sources: IARC, Globocan 2008.

Figure 6: Age-standardized incidence rates of cervical cancer in GAVI countries



More than a half of the global burden of cervical cancer worldwide occurs in GAVI countries. 254,374 (48%) new cases in GAVI-eligible and 28,337 (5%) new cases in GAVI-graduating countries were estimated in 2008. Cervical cancer is responsible of 23% and 10% of all female cancers respectively.

Worldwide, the highest incidence rates are found in Eastern and Western Africa (cervical cancer age-standardized rate (ASR) of more than 30 new cancer cases per 100,000 women), where 22 out of 26 countries are GAVI countries. These two African regions are followed by Southern Africa (ASR 26.8 per 100,000), South-Central Asia (ASR 24.6 per 100,000), South America and Middle Africa (ASRs 23.9 and 23.0 per 100,000 respectively).

Globally, ASR in GAVI-eligible countries is 25.9 per 100,000, 3-fold higher than in More developed regions, and 1.5-fold higher than in Less developed regions. GAVI-graduating countries have lower rates (ASR 14.5 per 100,000) but higher than in Less developed regions.

Four of the most populated countries of the world, which represent almost 25% of the world female population, are GAVI-eligible countries: Nigeria (14,550 cases, ASR 33.0 per 100,000), Bangladesh (17,686 cases, ASR 29.8 per 100,000), India (134,420 cases, ASR 27.0 per 100,000) and Pakistan (11,688 cases, ASR 19.5 per 100,000).

Rates per 100,000 women per year. Standardized rates have been estimated using the direct method and the World population as the reference.
GAVI-eligible countries: GNI per capita <= 1,500U$; GAVI-graduating countries: GNI per capita > 1,500U$ but they have a final opportunity in 2011 to apply for GAVI support.
Data sources: IARC, Globocan 2008.

Based on age-standardized incidence rates, cervical cancer is the leading cause of female cancer in GAVI-eligible countries. In GAVI-graduating countries, cervical cancer is not as frequent but remains as the 3rd most common female cancer (preceded by breast and colorectal cancer). Cervical cancer is the 2nd leading cause of female cancer in the world and in less developed regions, only preceded by breast cancer, and ranks 7th in more developed regions (Figure 8, 9).

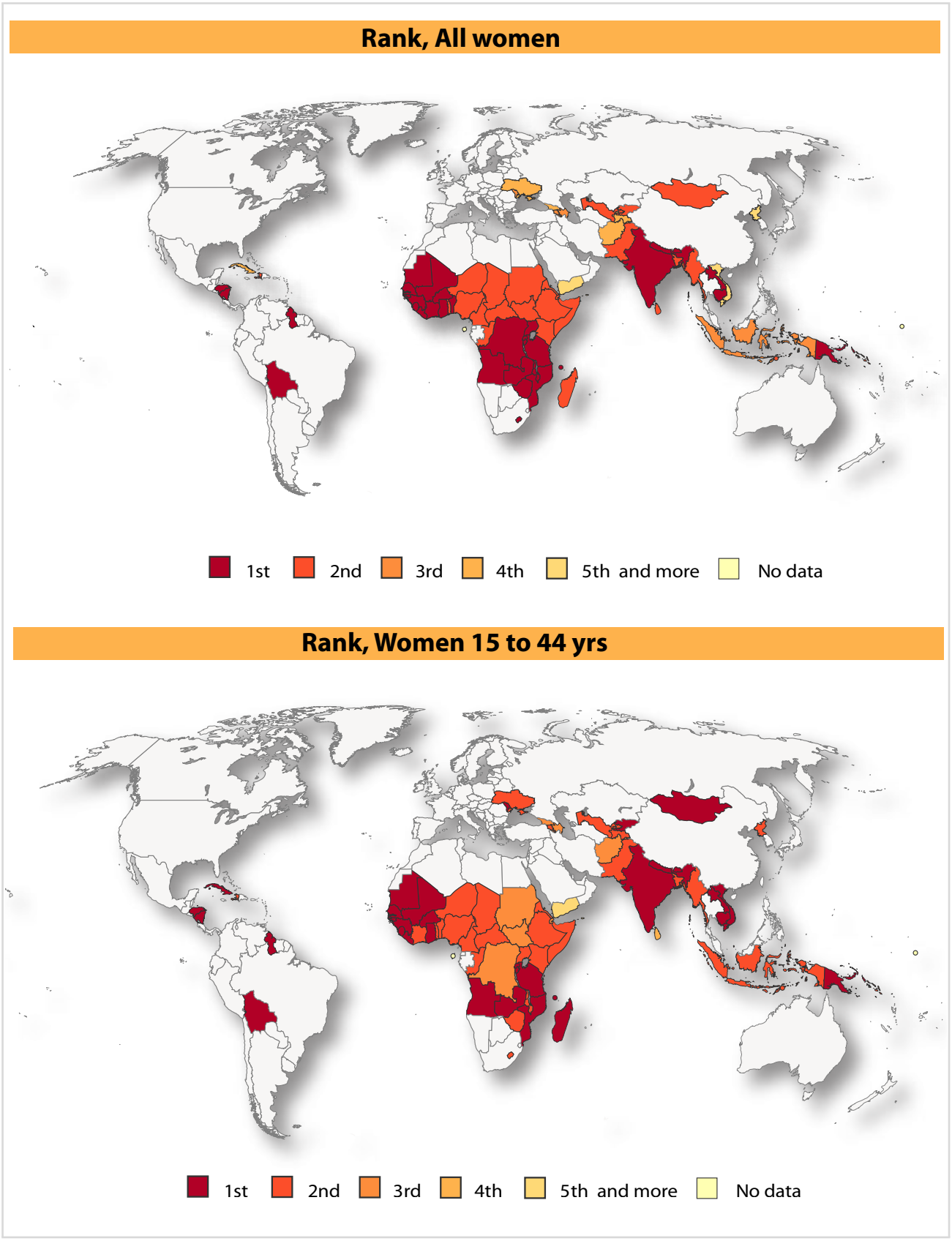
Among women aged 15-44 years, cervical cancer ranks 2nd in GAVI-eligible countries with incidence rates close to those for breast cancer. Cervical cancer also ranks 2nd in GAVI-graduating countries and in less developed regions and moves up to the 3rd ranking position in more developed regions (Figure 8, 9).

Although cancer (all sites) is more frequent in more developed regions (ASR nearly 2-fold higher) than in GAVI countries and in less developed regions, cervical cancer ASR is 3-fold higher in GAVI-eligible countries than in more developed regions and almost 2-fold higher in GAVI-graduating ones (Figure 10).

Cervical cancer ASR rates in women aged 15-44 years are higher in GAVI countries when compared to more developed regions, although the global cancer incidence ASR is nearly 2-fold higher in more developed regions than in GAVI countries (Figure 10).

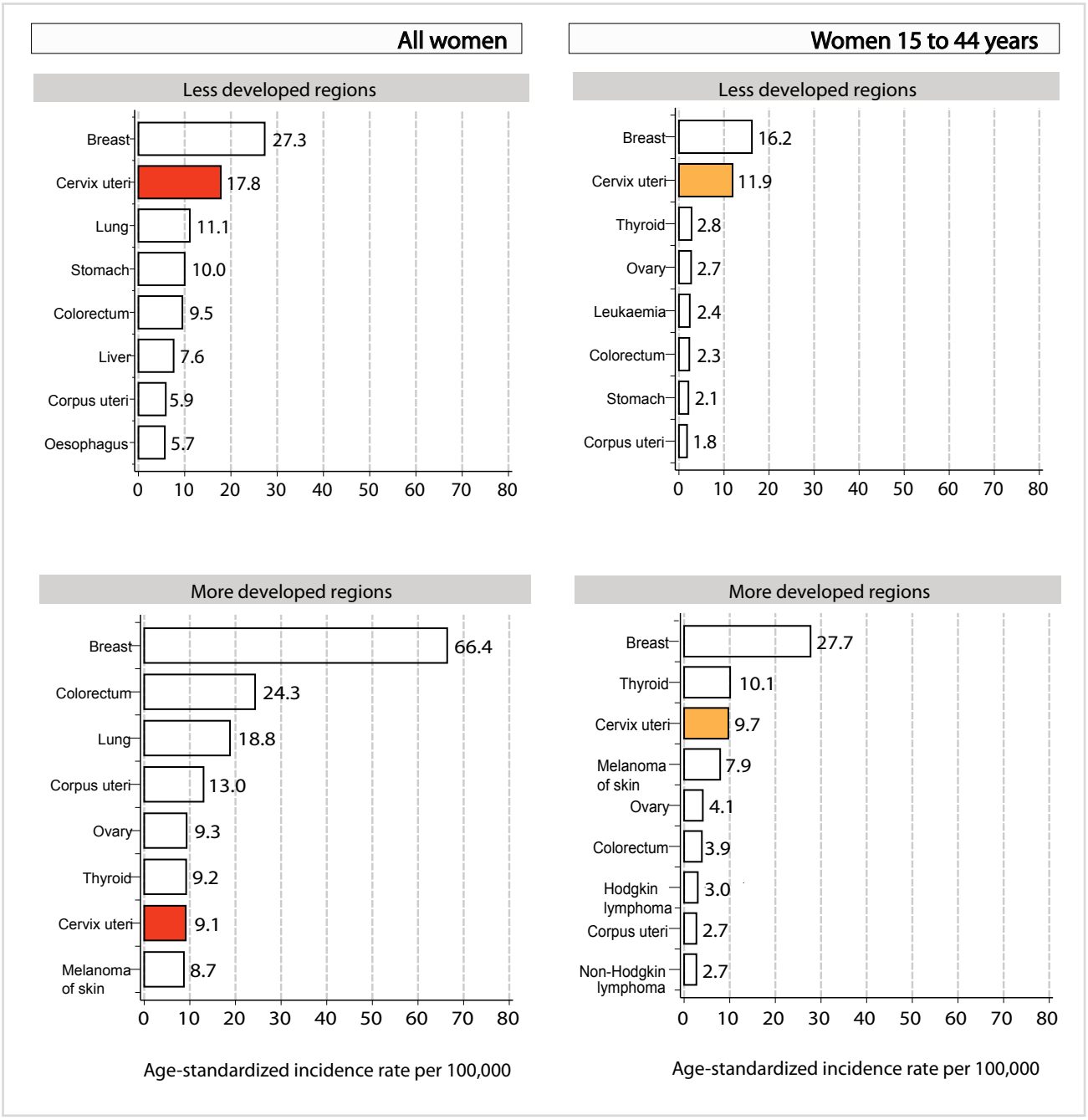
Cervical cancer age-specific incidence rates rise worldwide in women older than 15 years until the age of 65 years. When compared to the world, GAVI-eligible countries show much greater increases in incidence rates with increasing age (Figure 11). However, in absolute numbers, burden at young ages is very high in both the world and GAVI countries. The absolute number of cases in GAVI countries account for almost 60% of cervical cancer cases in women aged 15-54 years (Figure 12). Cervical cancer peak incidence in GAVI-eligible countries is observed in women aged 60-64 years, with estimated rates of 90 cases per 100,000 women. Incidence rates in women aged 60-64 years are 5-fold higher than in more developed regions and 2-fold higher than world rates. Cervical cancer peak incidence in GAVI-graduating countries is also found in women aged 60-64 years, with age-specific incidence rates close to the average world rates (Figure 11).

Figure 7: Ranking of cervical cancer incidence rates relative to other female cancers among all women and women aged 15 to 44 years in GAVI countries



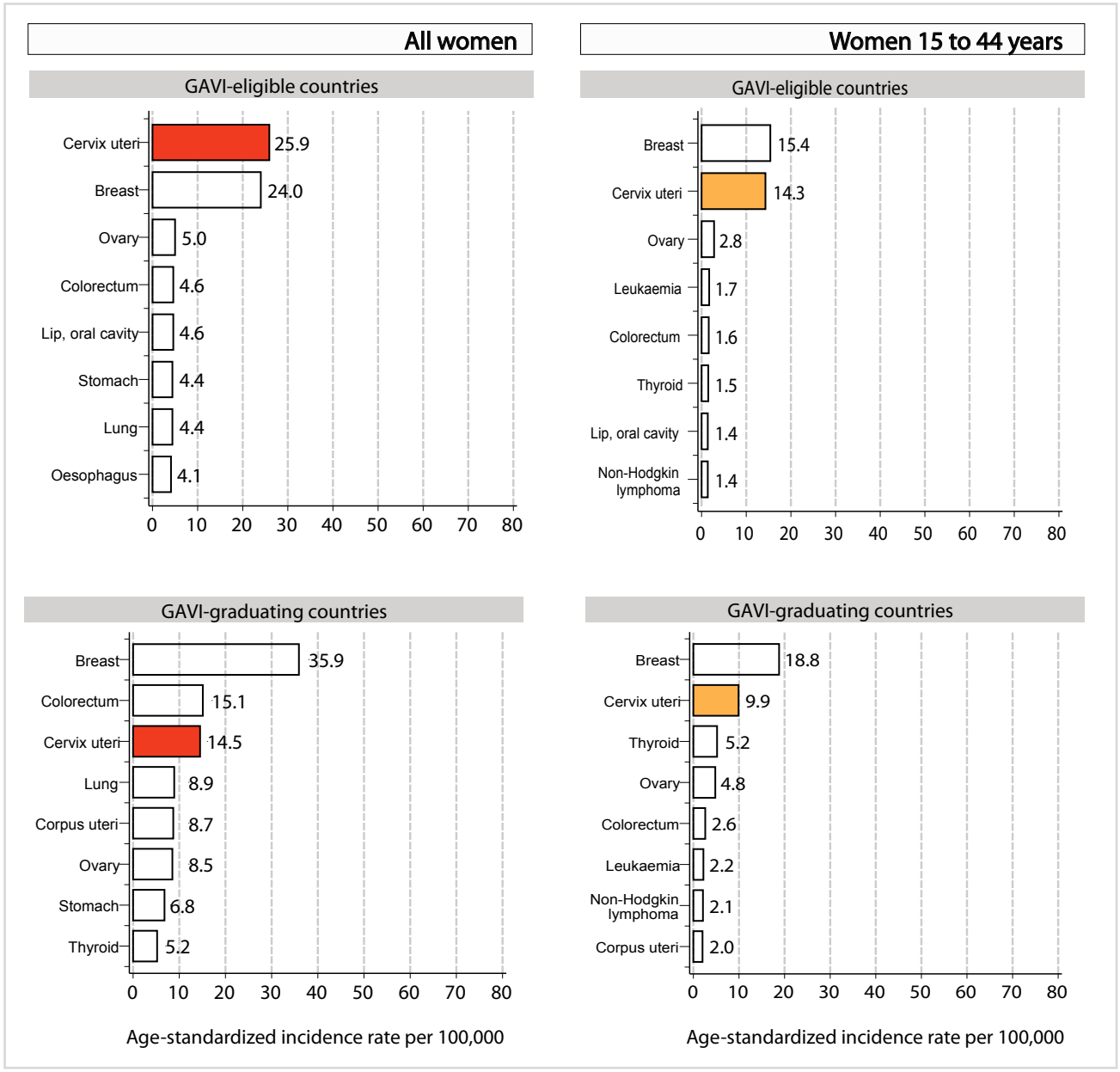
Highest incidence rate rank 1st. Ranking is based on crude incidence rates (actual number of cervical cancer cases) in the country/region. Ranking using ASR may differ.
GAVI-eligible countries: GNI per capita <= 1,500U$; GAVI-graduating countries: GNI per capita > 1,500U$ but they have a final opportunity in 2011 to apply for GAVI support.
Data source: IARC, Globocan 2008.

Figure 8: Incidence rates of the eight most frequent female cancers in "All women" and in "Women aged 15 to 44 years" in Less and More developed regions



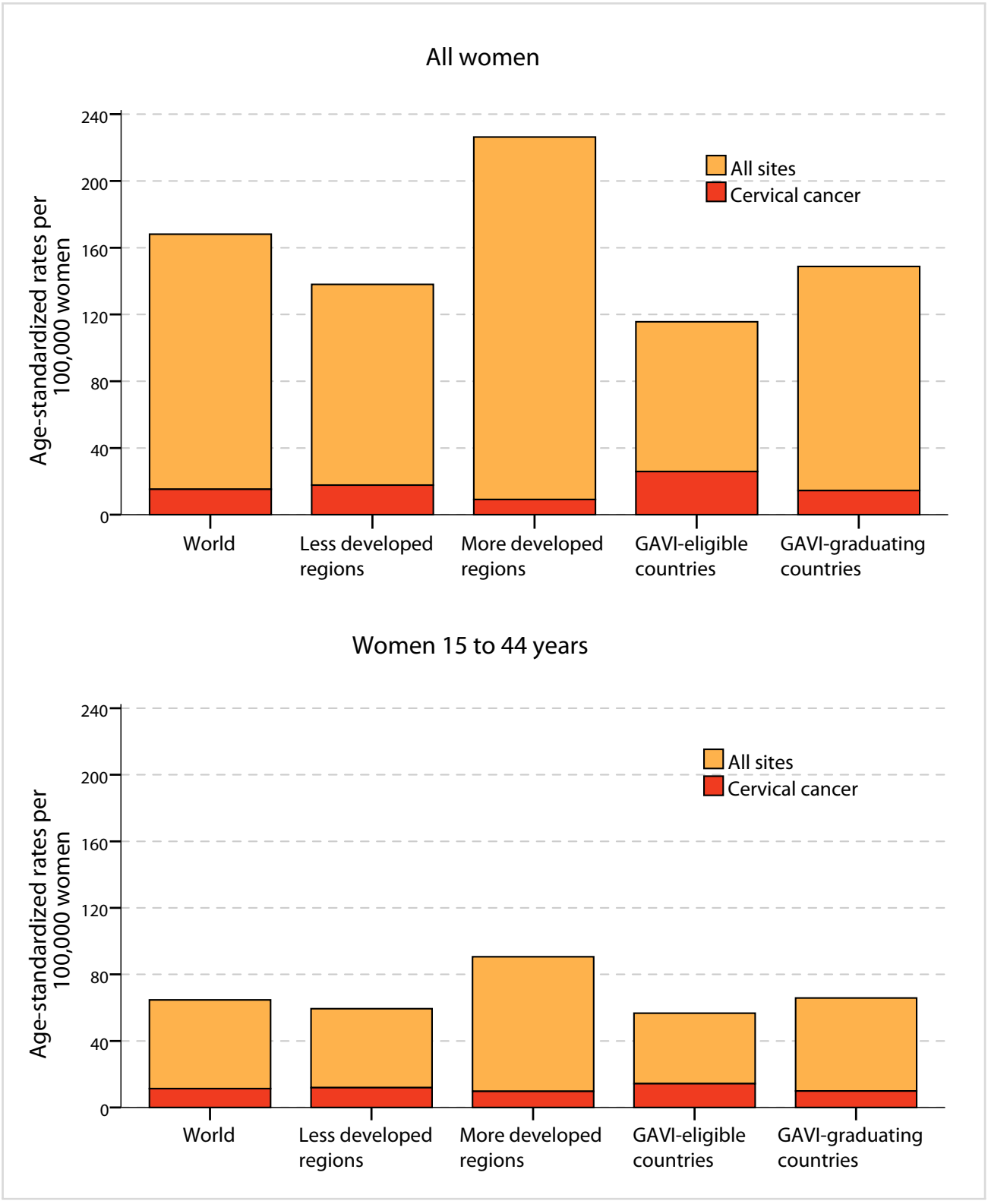
Standardized rates have been estimated using the direct method and the World population as the reference.
Ranking is based on ASR rates in the country/region. Ranking using Crude Rate may differ.
Data source: IARC, Globocan 2008.

Figure 9: Incidence rates of the eight most frequent female cancers in "All women" and in "Women aged 15 to 44 years" in GAVI-eligible and GAVI-graduating countries



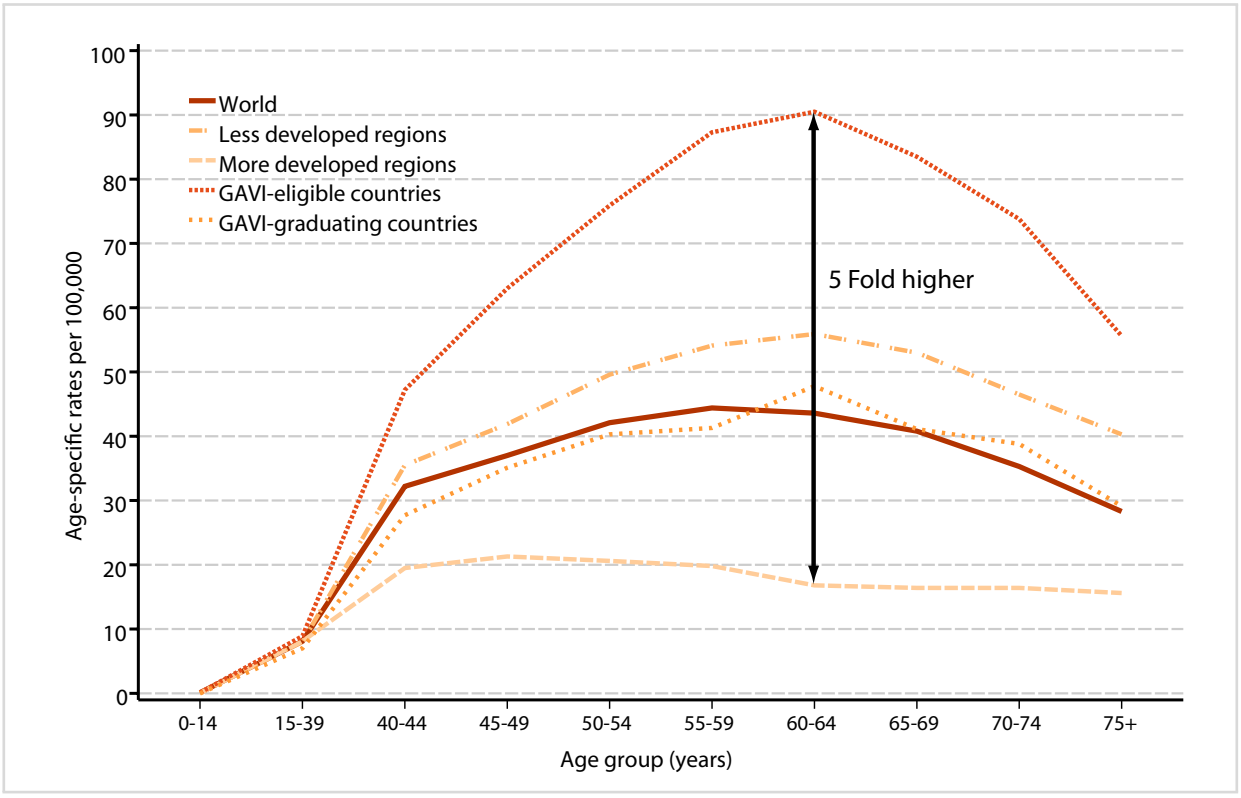
Standardized rates have been estimated using the direct method and the World population as the reference.
Ranking is based on ASR rates in the country/region. Ranking using Crude Rate may differ.
GAVI-eligible countries: GNI per capita <= 1,500U$; GAVI-graduating countries: GNI per capita > 1,500U$ but they have a final opportunity in 2011 to apply for GAVI support.
Data source: IARC, Globocan 2008.

Figure 10: Age-standardized incidence rates of all cancer sites compared to cervical cancer, in the World, Less and More developed regions and in GAVI countries



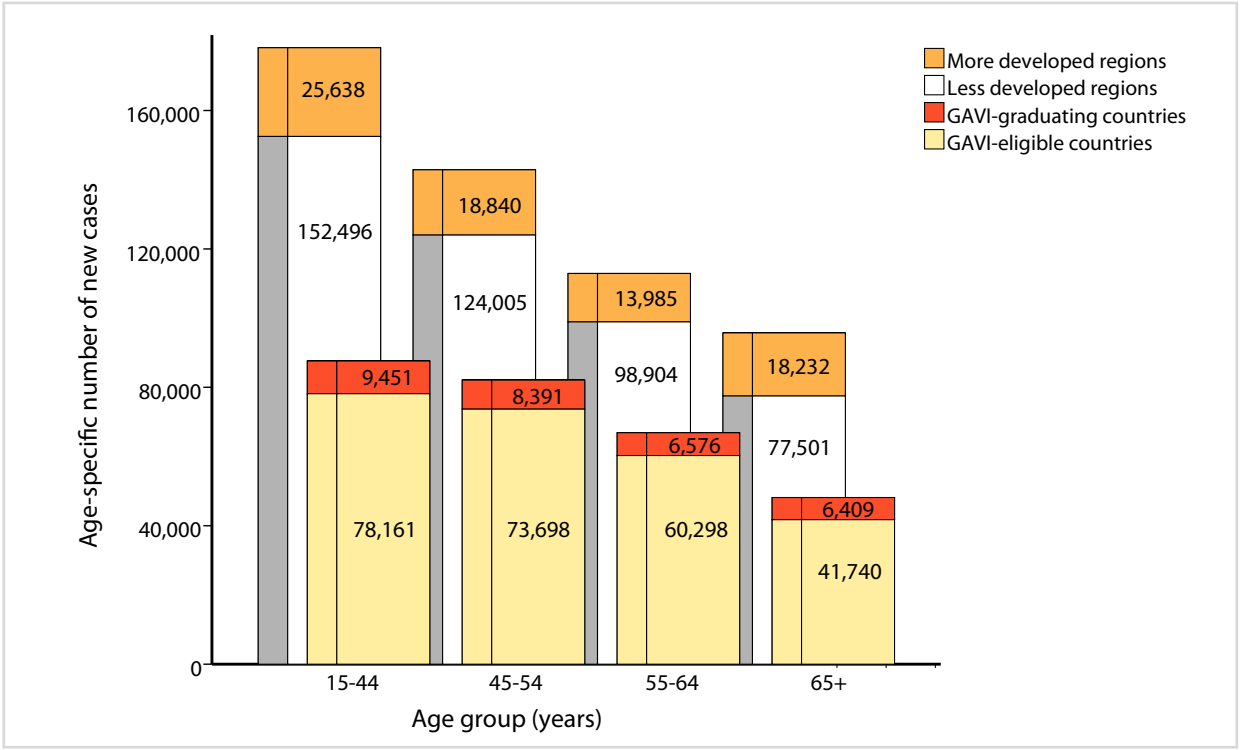
Standardized rates have been estimated using the direct method and the World population as the reference.
GAVI-eligible countries: GNI per capita <= 1,500U$; GAVI-graduating countries: GNI per capita > 1,500U$ but they have a final opportunity in 2011 to apply for GAVI support.
Data sources: IARC, Globocan 2008.

Figure 11: GAVI age-specific incidence rates of cervical cancer compared to that of the World, Less and More developed regions



GAVI-eligible countries: GNI per capita <= 1,500U$; GAVI-graduating countries: GNI per capita > 1,500U$ but they have a final opportunity in 2011 to apply for GAVI support.
Data sources: IARC, Globocan 2008.

Figure 12: GAVI age-specific incidence number of new cases of cervical cancer compared to those in Less and More developed regions



GAVI-eligible countries: GNI per capita <= 1,500U$; GAVI-graduating countries: GNI per capita > 1,500U$ but they have a final opportunity in 2011 to apply for GAVI support.
Data sources: IARC, Globocan 2008.

3.1.2 Mortality

KEY STATS

275,008 cervical cancer deaths occur **annually** worldwide.

148,803 deaths are from **GAVI-eligible countries** (54%).

Cervical cancer is the **leading cause** of female cancer death **in GAVI-eligible countries**.

Age-standardized mortality rates in GAVI countries are **5-fold higher** than in More developed regions and 1.5-fold than in Less developed regions.

Cervical cancer **peak mortality in GAVI-eligible countries** is observed in **women aged 70-74 years**, with estimated rates of 75 cases per 100,000 women aged 70-74 years, and **7-fold higher** than More developed regions estimates for this age group.

Cervical cancer is the fifth leading cause of cancer death in females worldwide, with an estimated 275,008 new deaths in 2008 (8% of all cancers). Over 88% of these deaths occur in less developed regions, representing 11% of female cancer deaths.

It should also be emphasized that the risk of women dying from cervical cancer before age 75 years in GAVI-eligible countries is 6-fold and more than 1.5-fold higher than in more developed and in less developed regions, respectively. In GAVI-graduating countries, the risk is almost 3-fold higher than in more developed regions (Table 3).

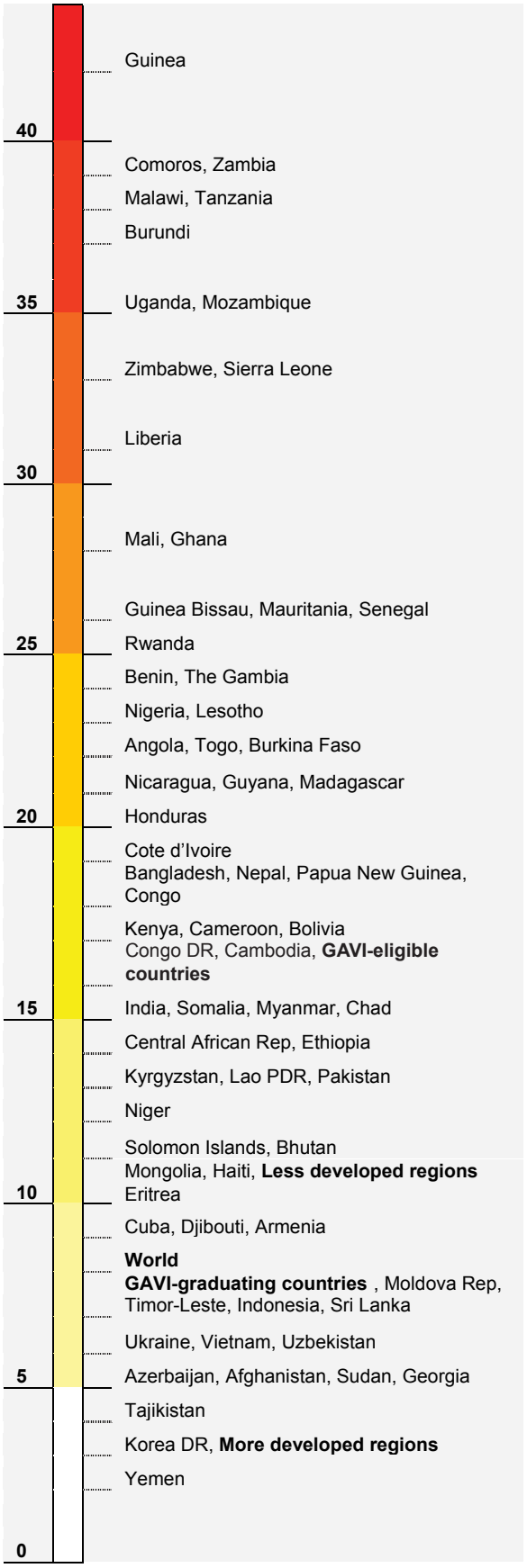
Specific mortality rates for each GAVI country are given in Figure 13 and Annex 5 and specific ranking for each GAVI country can be found in Figure 14.

Table 3: Mortality burden from cervical cancer in the World, Less and More developed regions and GAVI countries

	N cases	Crude rate	ASR*	Cum risk * by age 75	Ranking†	
					All women	Women 15-44 yrs
World	275,008	8.2	7.8	0.9	5th	2nd
Less developed regions	242,077	8.9	9.8	1.1	2nd	2nd
More developed regions	32,931	5.2	3.1	0.3	11th	2nd
GAVI-eligible countries (56 countries)	148,803	11.7	15.9	1.8	1st	1st
GAVI-graduating countries (16 countries)	14,530	7.8	7.4	0.8	4th	2nd

*ASR: Age-standardized rate; Cum. risk: Cumulative risk.
Rates per 100,000 women per year. Standardized rates have been estimated using the direct method and the World population as the reference.
†Ranking of cervical cancer mortality to other cancers among all women and women aged 15-44 years according to highest mortality rates (ranking 1st). Ranking is based on crude mortality rates (actual number of cervical cancer deaths) in the country/region. Ranking using ASR may differ.
GAVI-eligible countries: GNI per capita <= 1,500U$; GAVI-graduating countries: GNI per capita > 1,500U$ but they have a final opportunity in 2011 to apply for GAVI support.
Data sources: IARC, Globocan 2008.

Figure 13: Age-standardized mortality rates of cervical cancer in GAVI countries



Almost two-thirds of all cervical cancer deaths occur in GAVI countries. 148,803 (54%) deaths in GAVI-eligible and 14,530 (5%) deaths in GAVI -graduating countries were estimated in 2008. Cervical cancer is responsible of 20% and 8% of all female cancer deaths respectively.

Worldwide, the highest mortality rates are found in Eastern and Western Africa (Cervical cancer age-standardized rate (ASR) of more than 24 cancer deaths per 100,000 women), where 22 of the total 26 countries in these regions are GAVI countries. These are followed by: Middle Africa (ASR 17.0 per 100,000) Melanesia (ASR 16.8 per 100,000), Southern Africa (ASR 14.0 per 100,000) and Southern Asia (ASR 14.4 per 100,000)

-

Globally, cervical cancer age standardized mortality rate is 15.9 per 100,000 in GAVI-eligible countries, 5-fold higher than in more developed regions, and 1.5-fold higher than in less developed regions. GAVI-graduating countries have lower rates (ASR 7.4 per 100,000) but still 1.5-fold higher than in more developed regions

Age-standardized mortality rate in the most populated GAVI countries are: ASR 22.9 per 100,000 in Nigeria, ASR 17.9 per 100,000 in Bangladesh ASR 15.2 per 100,000 in India and ASR 12.9 per 100,000 in Pakistan.

Rates per 100,000 women per year. Standardized rates have been estimated using the direct method and the World population as the reference.
GAVI-eligible countries: GNI per capita <= 1,500U$; GAVI-graduating countries: GNI per capita > 1,500U$ but they have a final opportunity in 2011 to apply for GAVI support.
Data sources: IARC, Globocan 2008.

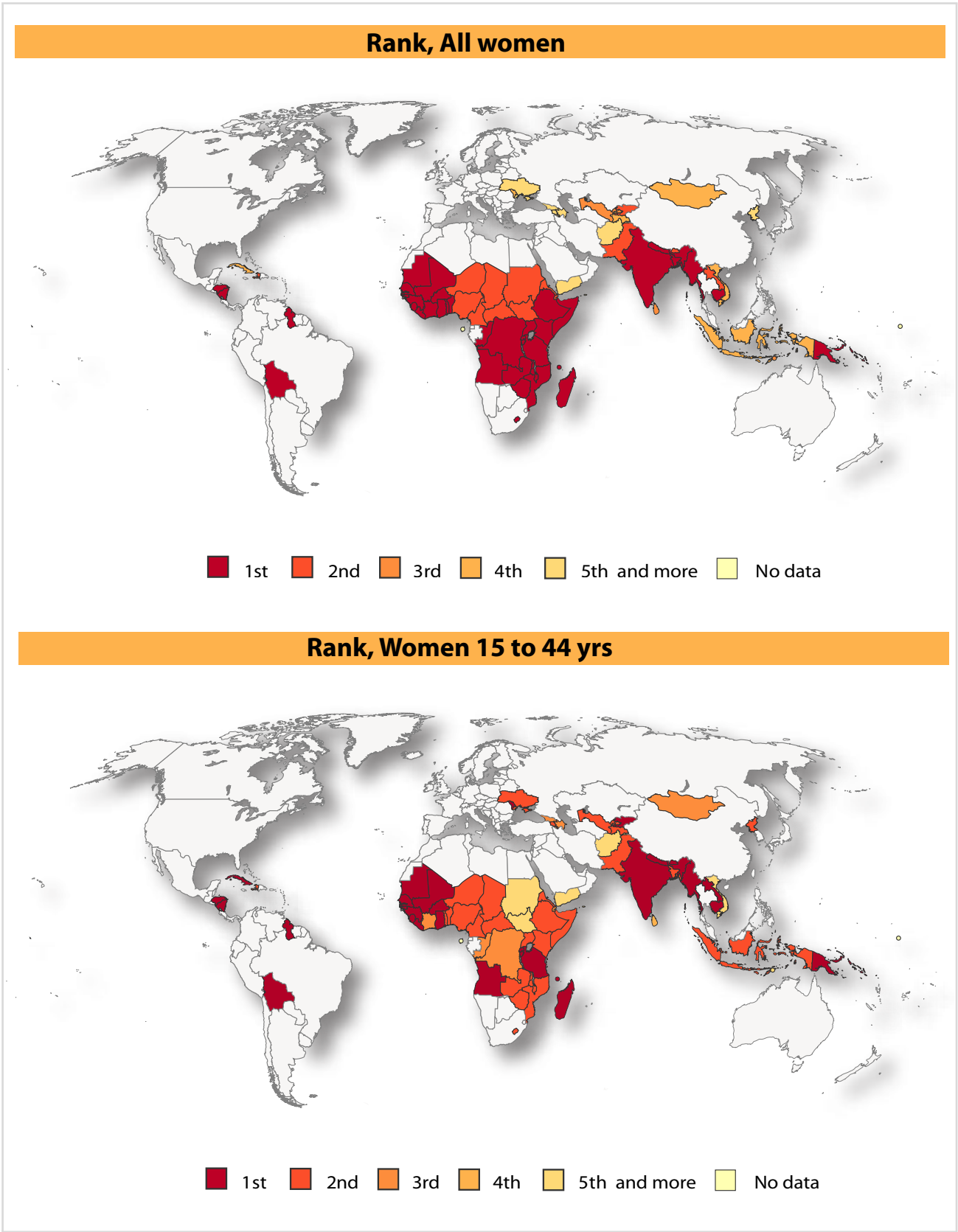
Based on age-standardized mortality rates, cervical cancer is the leading cause of female cancer deaths in GAVI-eligible countries. In GAVI-graduating countries, cervical cancer is not as frequent but remains the 4th most common cause of female cancer death. Cervical cancer is the 5th leading cause of female cancer deaths in the world, the 2nd in less developed regions and the 7th in more developed regions (Figure 15, 16).

Among women aged 15-44 years cervical cancer is the leading cause of cancer death in GAVI eligible countries, and ranks the 2nd in GAVI graduating countries, in less developed and in more developed regions, only preceded by breast cancer. In women aged 15-44 years, mortality rates are 3-fold higher in GAVI countries when compared to more developed regions (Figure 15, 16).

Although cancer incidence rates (all sites) in GAVI countries and in less developed regions are half those seen in more developed regions, cancer mortality ASR (all sites) are generally similar. In addition, cervical cancer mortality rates are more than 5-fold higher in GAVI-eligible countries than in more developed regions, and 2.4-fold higher in GAVI-graduating countries than in more developed regions.

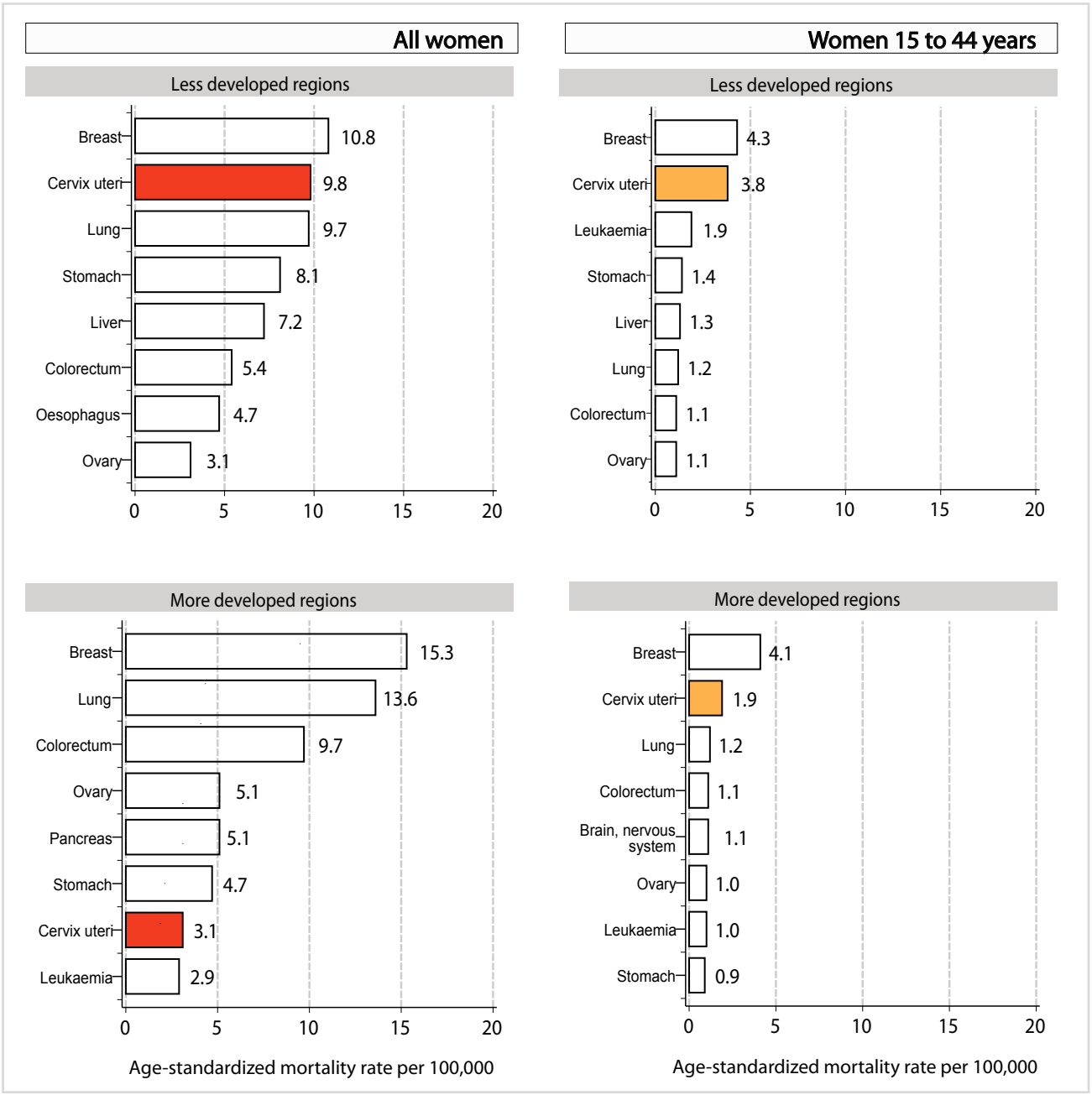
Cervical cancer age-specific mortality rates rise worldwide in women older than 15 years until the age of 75 years. When compared to the world, in GAVI-eligible countries, much higher increases in mortality rates are found with increasing ages (Figure 17). However, in absolute numbers, burden of cervical cancer deaths is quite uniform in women older than 45 years (Figure 18). Cervical cancer peak mortality in GAVI-eligible countries is observed in women aged 70-74 years, with estimated rates of 75 cases per 100,000 women (close to the peak incidence rates). Mortality rates in women aged 70-74 years are 7-fold higher than in more developed regions and more than 2-fold higher than the worl ones. Cervical cancer peak mortality in GAVI-graduating countries is also found in women aged 70-74 years, with age-specific mortality rates close to the average world rates and 3-fold higher than rates observed in more developed regions (Figure 17).

Figure 14: Ranking of cervical cancer mortality rates relative to other female cancers among all women and women aged 15 to 44 years in GAVI countries



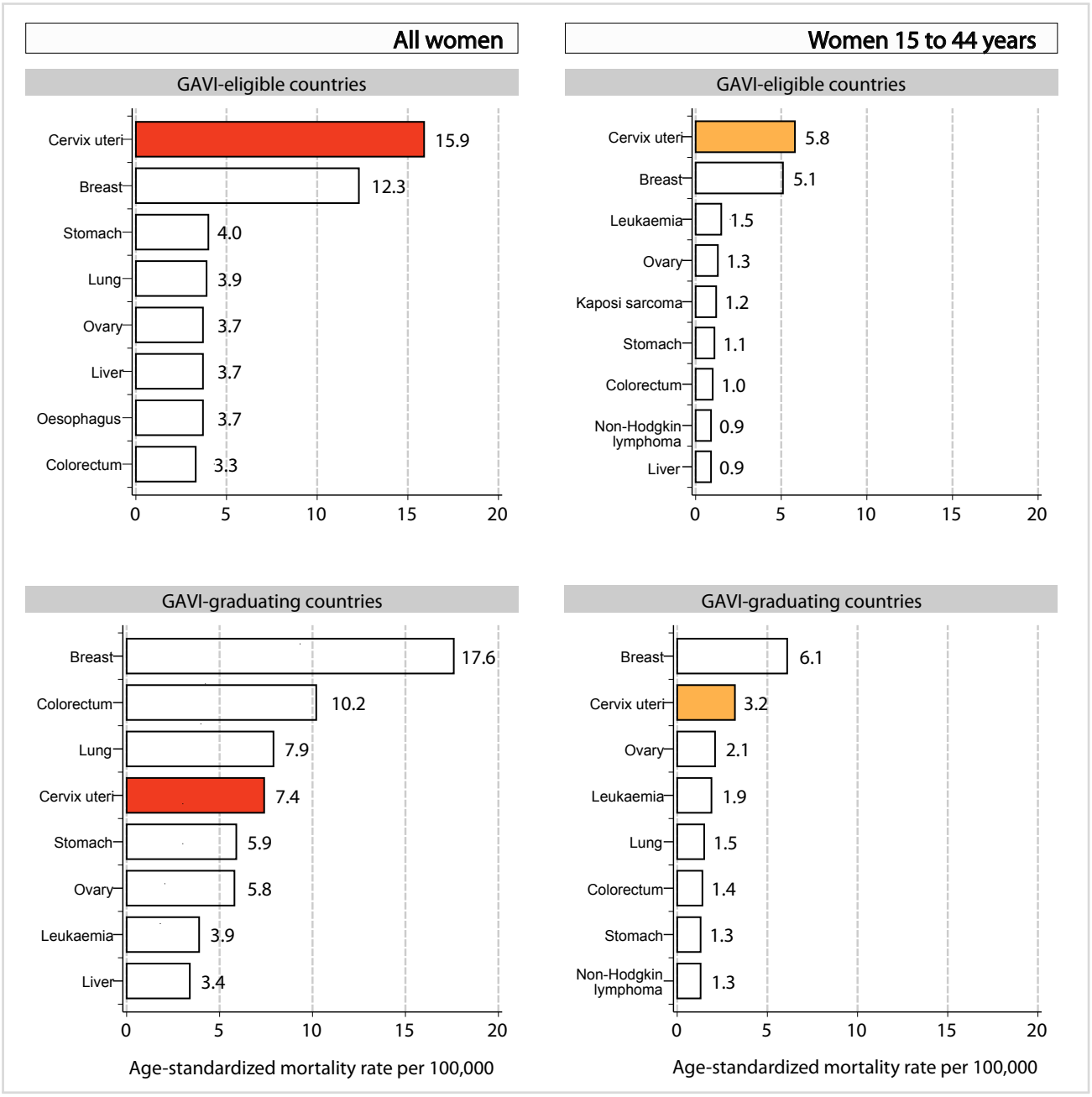
Highest mortality rate rank 1st. Ranking is based on crude mortality rates (actual number of cervical cancer deaths) in the country/region. Ranking using ASR may differ.
GAVI-eligible countries: GNI per capita <= 1,500U$; GAVI-graduating countries: GNI per capita > 1,500U$ but they have a final opportunity in 2011 to apply for GAVI support.
Data source: IARC, Globocan 2008.

Figure 15: Mortality rates of the eight most frequent sites of cancer mortality in "All women" and in "Women aged 15 to 44 years" in Less and More developed regions



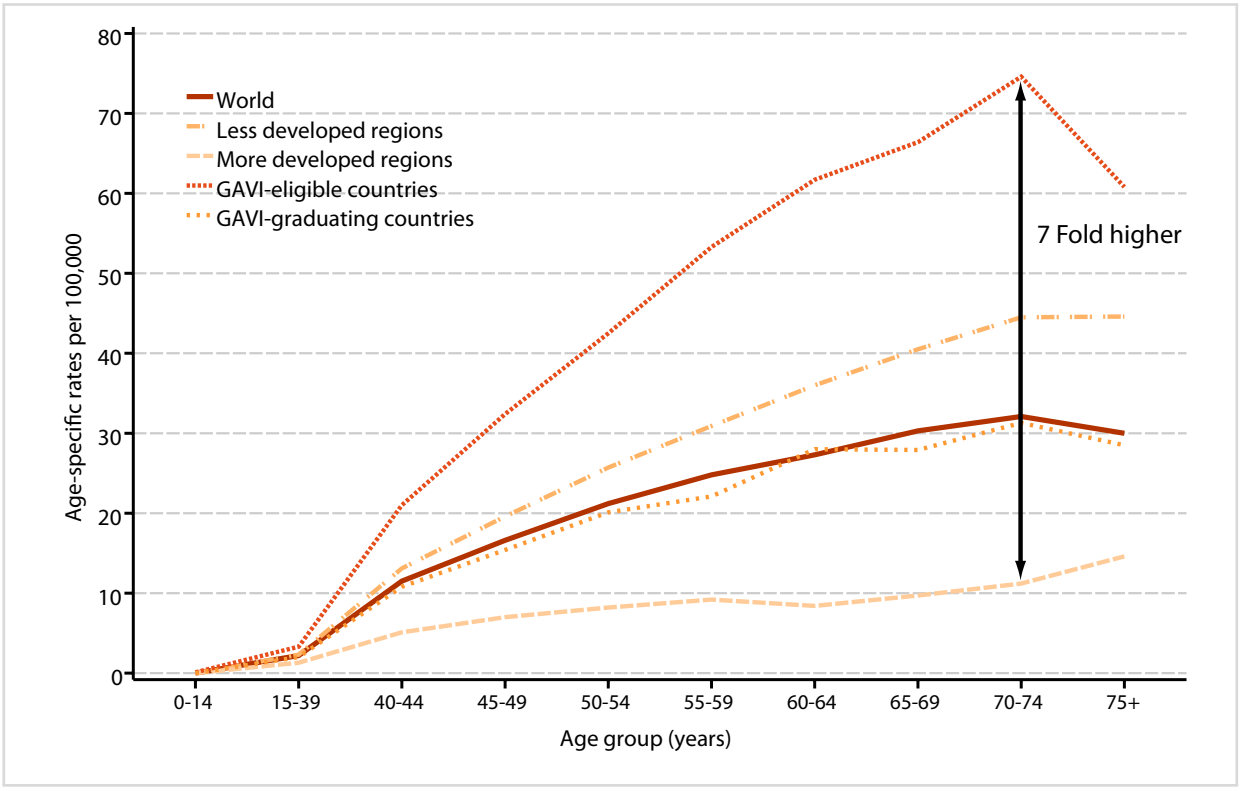
Standardized rates have been estimated using the direct method and the World population as the reference.
Ranking is based on ASR rates in the country/region. Ranking using Crude Rate may differ.
Data source: IARC, Globocan 2008.

Figure 16: Mortality rates of the eight most frequent sites of cancer mortality in "All women" and in "Women aged 15 to 44 years" in GAVI-eligible and GAVI-graduating countries



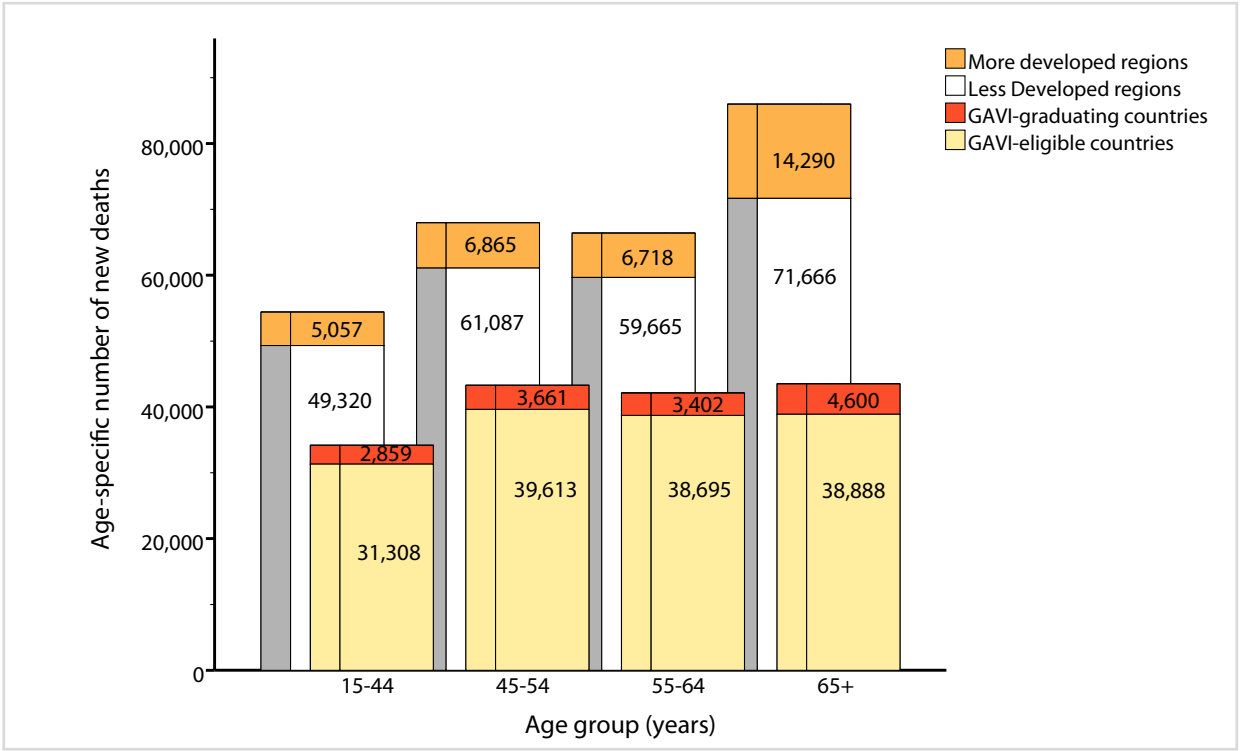
Standardized rates have been estimated using the direct method and the World population as the reference.
Ranking is based on ASR rates in the country/region. Ranking using Crude Rate may differ. GAVI-eligible countries: GNI per capita <= 1,500U$; GAVI-graduating countries: GNI per capita > 1,500U$ but they have a final opportunity in 2011 to apply for GAVI support.
Data source: IARC, Globocan 2008.

Figure 17: GAVI age-specific mortality rates of cervical cancer compared to that of the World, Less and More developed regions



GAVI-eligible countries: GNI per capita <= 1,500U$; GAVI-graduating countries: GNI per capita > 1,500U$ but they have a final opportunity in 2011 to apply for GAVI support.
Data source: IARC, Globocan 2008.

Figure 18: GAVI age-specific number of deaths of cervical cancer compared to those in Less and More developed regions



GAVI-eligible countries: GNI per capita <= 1,500U$; GAVI-graduating countries: GNI per capita > 1,500U$ but they have a final opportunity in 2011 to apply for GAVI support.
Data source: IARC, Globocan 2008.

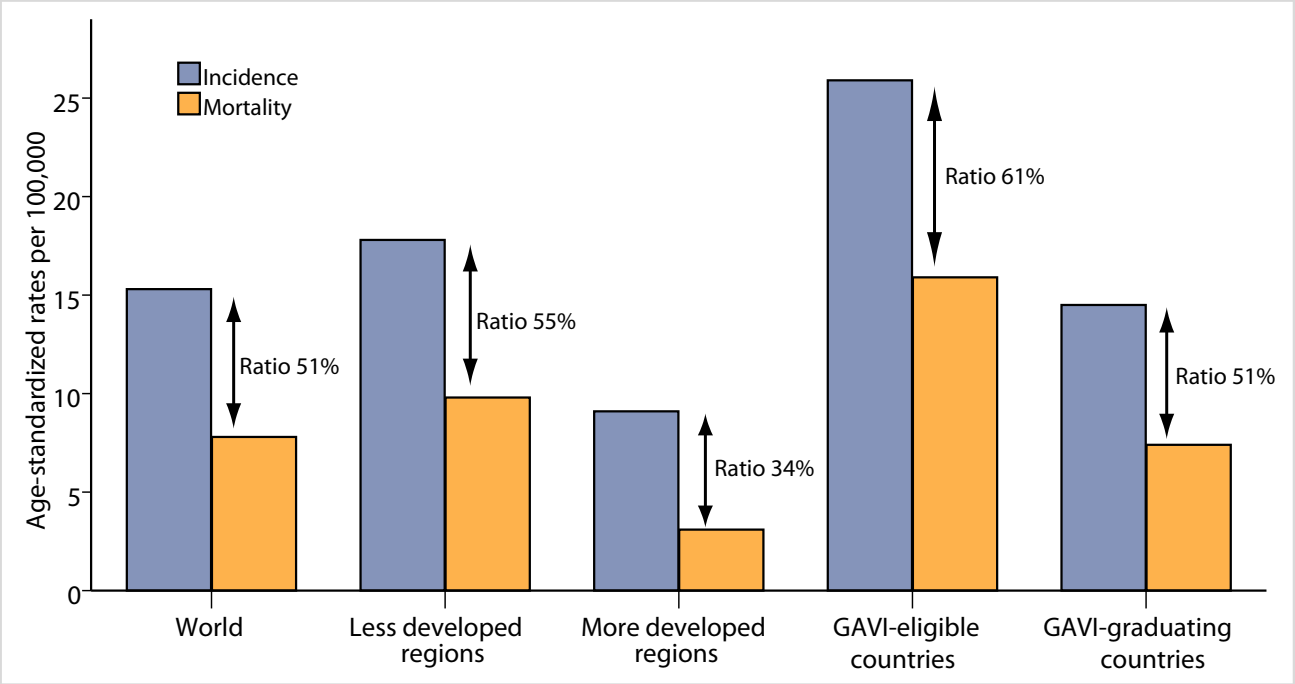
3.1.3 Comparison of incidence, mortality and survival

Cervical cancer tends to be diagnosed at later stages in less developed regions compared with more developed ones and this, combined with reduced access to appropriate therapeutic facilities and drugs, has an adverse effect on mortality and survival.

Although cervical cancer incidence and mortality rates have declined in the last 50 years in many of the more developed regions, they have remained relatively stable in less developed regions. Worldwide, mortality rates of cervical cancer are substantially lower than incidence rates with a ratio of mortality to incidence of 51%. In GAVI-eligible and GAVI-graduating countries, this ratio reaches 61% and 51% respectively, compared to the 34% ratio in more developed regions (Figure 19). Figure 20 shows the age-specific incidence and mortality rates of cervical cancer in GAVI countries.

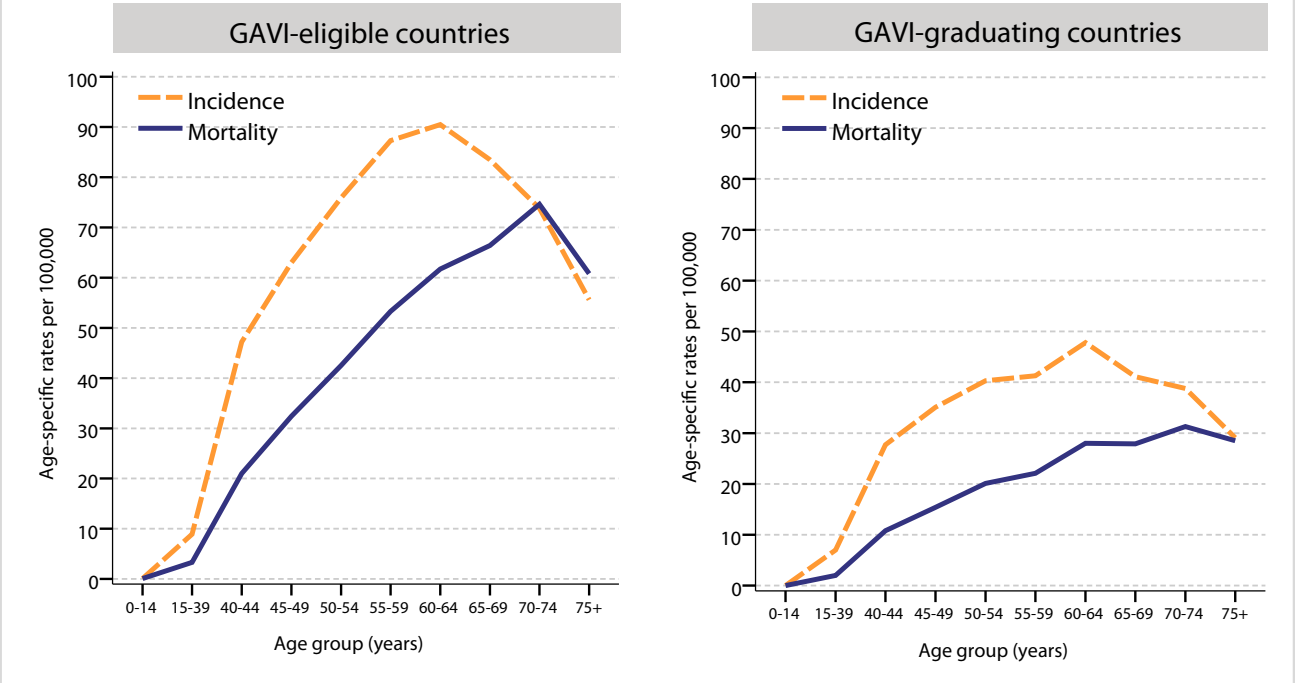
Data on survival are scarce. Routine survival monitoring occurs in limited areas of the world, and survival rates are higher in more developed regions. Information on cervical cancer survival is only available for five GAVI countries (The Gambia, Uganda, Zimbabwe, India and Cuba). Age-adjusted 5-year relative survival (%) for cervical cancer is generally poor in GAVI countries, ranging from 20% to 59%, with the lowest survival in Uganda and The Gambia and the highest in India (Madras and Karunagappally registry) and Cuba. The generally low cervical cancer survival in GAVI countries emphasizes the need for investments to improve prevention and control programs in these countries.

Figure 19: Incidence, mortality and ratio mortality to incidence (%) of cervical cancer in all women in the World, Less and More developed regions, GAVI-eligible and GAVI-graduating countries



Standardized rates have been estimated using the direct method and the World population as the reference.
GAVI-eligible countries: GNI per capita <= 1,500U$; GAVI-graduating countries: GNI per capita > 1,500U$ but they have a final opportunity in 2011 to apply for GAVI support.
Data sources: IARC, Globocan 2008.

Figure 20: Age-specific incidence and mortality rates of cervical cancer in GAVI-eligible and GAVI-graduating countries



GAVI-eligible countries: GNI per capita <= 1,500U$; GAVI-graduating countries: GNI per capita > 1,500U$ but they have a final opportunity in 2011 to apply for GAVI support.
Data sources: IARC, Globocan 2008.

3.1.4 Projections of new cases and deaths

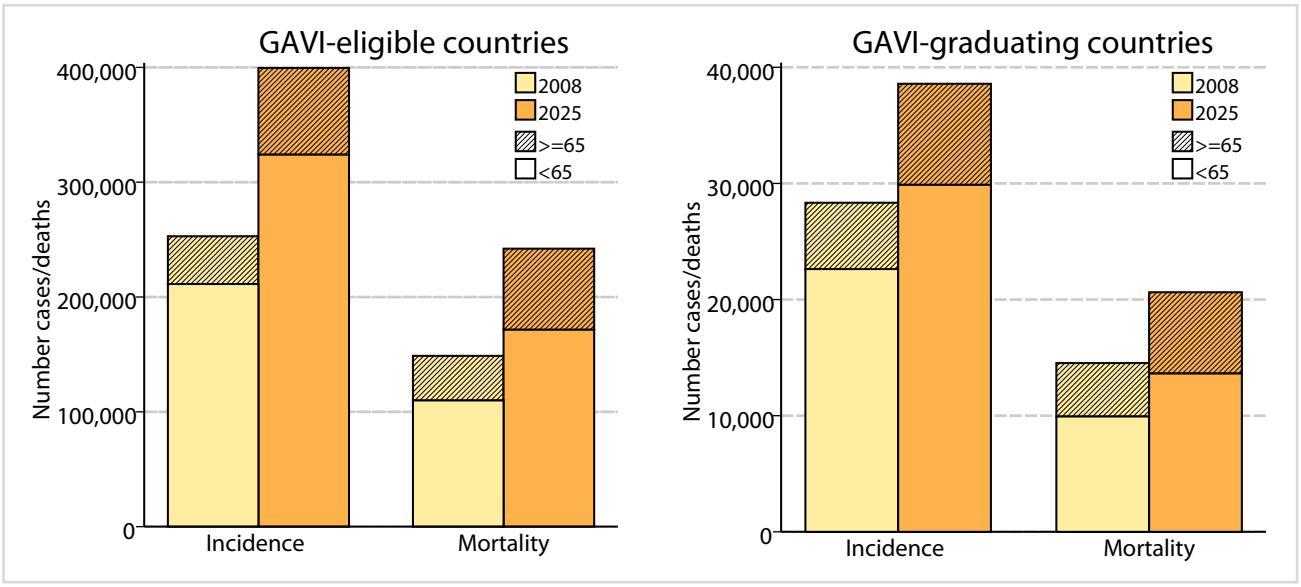
KEY STATS

Projected estimates of cervical cancer based exclusively on population growth are expected to rise to **720,415 new cases** and **394,905 deaths** in **2025**.

In 2025 is expected a **58% increase in new cancer cases** and **63% in deaths** due to cervical cancer **in GAVI-eligible countries**.

Without changes in prevention and control, projections for the coming years reveal a growing burden of cervical cancer with a change in the age profile. Projected global estimates of cervical cancer are expected to rise to 720,415 new cases and 394,905 deaths in 2025, which means a 36% and 44% of global increment in new cases and deaths, respectively. Virtually all of these new cases and deaths will be in less developed regions. In GAVI-eligible countries, a 58% increase in new cases and a 63% increase in deaths is expected. Projections for 2025 in GAVI-graduating countries are for a 36% increase in new cases and a 42% increase in deaths (Figure 21).

Figure 21: Estimated number of new cases and deaths of cervical cancer by age group in GAVI-eligible and GAVI-graduating countries, in 2008 and projected in 2025



GAVI-eligible countries: GNI per capita <= 1,500U$; GAVI-graduating countries: GNI per capita > 1,500U$ but they have a final opportunity in 2011 to apply for GAVI support.
Data sources: IARC, Globocan 2008.

3.2 Anogenital cancers other than 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.

3.2.1 Anal cancer

Anal cancer is rare in the general population, with an average worldwide incidence of 1 per 100,000, but is reported to be increasing in more developed regions. Globally, there are an estimated 27,000 new cases every year (*Martel et al. 2012*). Women have higher incidences of anal cancer than men. Incidence is particularly high among populations of men who have sex with men, 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 4: Incidence of anal cancer by cancer registry in GAVI countries

		MALE			FEMALE		
Country and cancer registry	**Period**	**N cases**[1]	**Crude rate**[2]	**ASR**[2]	**N cases**[1]	**Crude rate**[2]	**ASR**[2]
India							
Chennai registry	1998-2002	51	0.5	0.5	41	0.4	0.5
Karunagappally registry	1998-2002	0	0.0	0.0	2	0.2	0.2
Mumbai registry	1998-2002	81	0.2	0.3	67	0.3	0.3
Nagpur registry	1998-2002	27	0.5	0.6	14	0.3	0.4
New Delhi registry	1998-2002	160	0.5	0.8	71	0.3	0.4
Poona registry	1998-2002	31	0.3	0.5	14	0.2	0.2
Trivandrum registry	1998-2002	4	0.1	0.1	2	0.1	0.1
Pakistan							
South Karachi registry	1998-2002	19	0.4	0.7	8	0.2	0.4
Uganda							
Kyadondo registry	1998-2002	2	0.1	0.2	3	0.1	0.0
Zimbawe							
Harare (African) registry	1998-2002	4	0.1	0.2	2	0.0	0.0

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/women per year.
Data sources: IARC, Cancer Incidence in 5 Continents, Vol IX
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.

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 (*Martel et al. 2012*). Worldwide, about 60% of all vulvar cancer cases occur in more developed regions. Over the past few decades, the incidence of vulvar cancer and vulvar intraepithelial neoplasia (VIN) has increased, particularly among younger women. Vulvar cancer has two distinct histological patterns with two different risk factor profiles: (1) basaloid/warty types and (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 vulvar lesions (>60%), they occur more often in older women and are more rarely associated with HPV *(IARC Monograph Vol 100B)*.

Table 5: Incidence of vulvar cancer by cancer registry in GAVI countries

Country and cancer registry		Period	N cases[1]	Crude rate[2]	ASR[2]
India					
	Chennai registry	1998-2002	53	0.5	0.6
	Karunagappally registry	1998-2002	1	0.1	0.1
	Mumbai registry	1998-2002	65	0.2	0.3
	Nagpur registry	1998-2002	28	0.6	0.7
	New Delhi registry	1998-2002	82	0.3	0.5
	Poona registry	1998-2002	8	0.1	0.1
	Trivandrum registry	1998-2002	10	0.3	0.3
Pakistan					
	South Karachi registry	1998-2002	3	0.1	0.1
Uganda					
	Kyadondo registry	1998-2002	7	0.2	0.3
Zimbawe					
	Harare (African) registry	1998-2002	16	0.4	0.7

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
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.

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 (*Martel et al. 2012*). Similar to cervical cancer, the majority of vaginal cancer cases (68%) occur in less developed regions. 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 years. (*Vaccine 2008, Vol. 26, Suppl 10*).

Table 6: Incidence of vaginal cancer by cancer registry in GAVI countries

Country and cancer registry		Period	N cases[1]	Crude rate[2]	ASR[2]
India					
	Chennai registry	1998-2002	71	0.7	0.8
	Karunagappally registry	1998-2002	6	0.6	0.7
	Mumbai registry	1998-2002	127	0.5	0.6
	Nagpur registry	1998-2002	0	0.0	0.0
	New Delhi registry	1998-2002	85	0.3	0.5
	Poona registry	1998-2002	45	0.5	0.7
	Trivandrum registry	1998-2002	7	0.2	0.2
Pakistan					
	South Karachi registry	1998-2002	6	0.2	0.3
Uganda					
	Kyadondo registry	1998-2002	6	0.2	0.6
Zimbabwe					
	Harare (African) registry	1998-2002	6	0.1	0.3

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
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.

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 (*Martel et al. 2012*). Penile cancer is rare and most commonly affects men aged 50-70 years. Incidence rates are higher in less developed regions than in more developed regions, accounting for up to 10% of male cancers in some parts of Africa, South America and Asia. Precursor penile intraepithelial neoplasia (PIN) lesions 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 PIN lesions are HPV DNA-positive.

Table 7: Incidence of penile cancer by cancer registry in GAVI countries

Country and cancer registry		Period	N cases[1]	Crude rate[2]	ASR[2]
India					
	Chennai registry	1998-2002	162	1.5	1.7
	Karunagappally registry	1998-2002	9	0.9	1.0
	Mumbai registry	1998-2002	196	0.6	0.8
	Nagpur registry	1998-2002	68	1.3	1.6
	New Delhi registry	1998-2002	211	0.6	0.9
	Poona registry	1998-2002	87	0.9	1.3
	Trivandrum registry	1998-2002	22	0.8	0.8
Pakistan					
	South Karachi registry	1998-2002	1	0.0	0.0
Uganda					
	Kyadondo registry	1998-2002	25	0.7	2.8
Zimbabwe					
	Harare (African) registry	1998-2002	19	0.4	0.9

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
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.

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 and lingual tonsil 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 Pharynx (excluding nasopharynx)

About 136,000 new cancer cases of the pharynx (excluding nasopharynx) and 96,000 cancer deaths occurred worldwide in 2008. Almost 64% of new cases occurred in less developed regions and 49% occurred in GAVI countries. Over 74% of deaths occurred in less developed regions and 59% in GAVI countries. Specific incidence and mortality rates for each GAVI country are given in Annex 6 and Annex 7.

Table 8: Incidence of cancer of the pharynx (excluding nasopharynx) in the World, Less and More developed regions and GAVI countries

	Male				Female			
	N cases	**Crude rate**	**ASR***	**Cum risk***	**N cases**	**Crude rate**	**ASR***	**Cum risk***
World	108,588	3.2	3.4	0.41	28,034	0.8	0.8	0.09
Less developed regions	68,523	2.4	3.0	0.37	19,593	0.7	0.8	0.09
More developed regions	40,065	6.7	4.5	0.54	8,441	1.3	0.8	0.09
GAVI-eligible countries (56 countries)	48,266	3.7	5.8	0.69	12,838	1.0	1.4	0.16
GAVI-graduating countries (16 countries)	4,391	2.4	2.7	0.34	1,138	0.6	0.6	0.07

* ASR: Age-standardized rate; Cum. risk: Cumulative risk by age 75. Rates per 100,000 men/women per year. Standardized rates have been estimated using the direct method and the World population as the reference.
GAVI-eligible countries: GNI per capita <= 1,500U$; GAVI-graduating countries: GNI per capita > 1,500U$ but they have a final opportunity in 2011 to apply for GAVI support.
Data sources: IARC, Globocan 2008

Table 9: Mortality of cancer of the pharynx (excluding nasopharynx) in the World, Less and More developed regions and GAVI countries

	Male				Female			
	N cases	**Crude rate**	**ASR***	**Cum risk***	**N cases**	**Crude rate**	**ASR***	**Cum risk***
World	76,458	2.2	2.4	0.29	19,092	0.6	0.5	0.06
Less developed regions	55,852	2.0	2.5	0.29	15,205	0.6	0.6	0.07
More developed regions	20,606	3.4	2.2	0.27	3,887	0.6	0.3	0.04
GAVI-eligible countries (56 countries)	42,019	3.2	5.0	0.59	10,485	0.8	1.1	0.13
GAVI-graduating countries (16 countries)	3,277	1.8	2.0	0.24	862	0.5	0.4	0.05

* ASR: Age-standardized rate; Cum. risk: Cumulative risk by age 75. Rates per 100,000 men/women per year. Standardized rates have been estimated using the direct method and the World population as the reference.
GAVI-eligible countries: GNI per capita <= 1,500U$; GAVI-graduating countries: GNI per capita > 1,500U$ but they have a final opportunity in 2011 to apply for GAVI support.
Data sources: IARC, Globocan 2008

4 HPV related statistics

HPV infection is commonly found in the anogenital tract of men and women with and without clinical lesions. The etiological 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 guidance to assess the burden of HPV infection in the population.

4.1 HPV burden in women with normal cervical 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 (CIN1, CIN2, CIN3/CIS) and invasive cervical cancer (ICC). HPV infection is measured by means of HPV DNA detection in cervical cells (fresh tissue, paraffin embedded or exfoliated cells). Detailed explanation of the terminology of cervical cancer lesions is given in Annex 8.

The prevalence of HPV increases with severity of cervical disease from 12-13% in normal cervical cytology to 89% in ICC. 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, HPV16 and 18, the two vaccine-preventable types, contribute to over 70% of all cervical cancer cases. 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.

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.

4.1.1 HPV prevalence in women with normal cervical cytology in the World, Less and More developed regions and GAVI countries

KEY STATS

In GAVI countries, 11.5% of women with **normal cervical cytological findings carry** a detectable **HPV infection**.

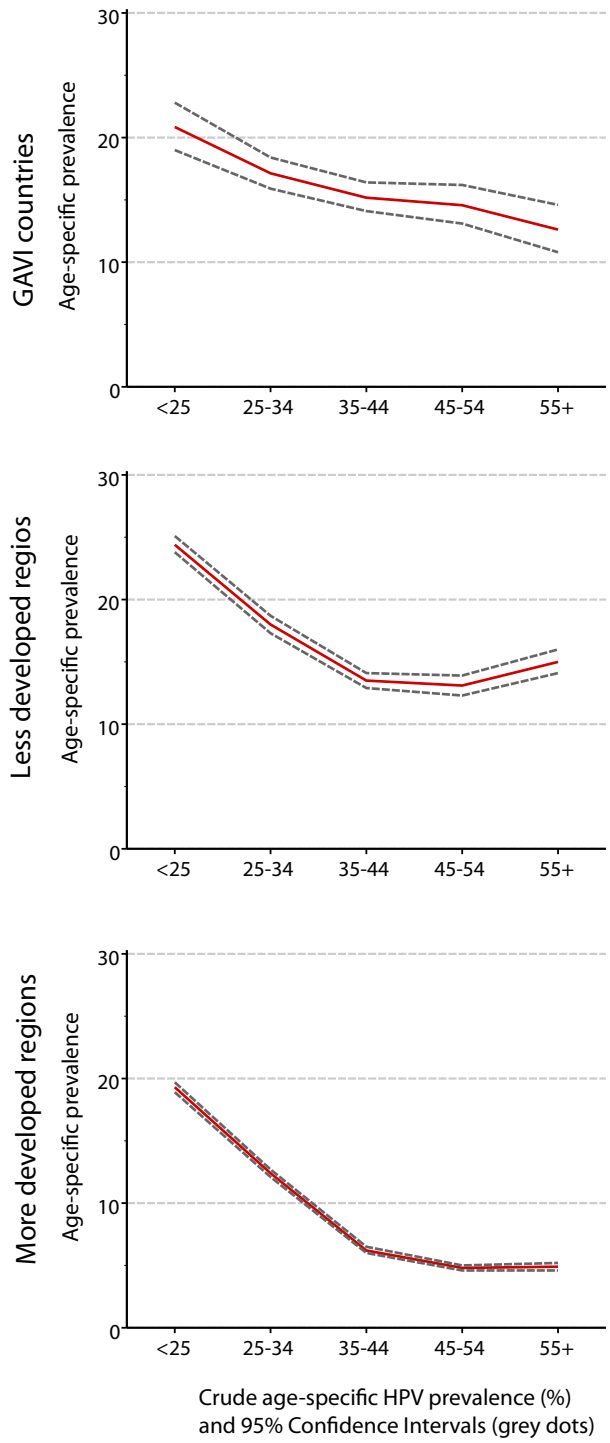
Genital HPV infection is one of the most common STIs worldwide, with an estimated 11.4% of women with normal cervical cytological findings carrying a detectable HPV infection. Higher prevalence is found in less developed regions when compared to that in more developed ones (14.3% vs 10.3%), with the highest prevalence in Sub-Saharan Africa, Latin America and Caribbean, Eastern Europe and South-Eastern Asia. Information about specific prevalence of HPV in women with normal cytology is only available for 13 GAVI countries (10 GAVI-eligible and 3 GAVI-graduating countries), with prevalence ranging from 5.4 to 47.9%. The global prevalence in GAVI countries is 11.5%, close to the world average, although it must be emphasized that 73% of the 31,758 women tested in the 13 GAVI countries come from India, where 7.9% prevalence is found. The majority of GAVI countries have higher prevalence estimates than the world average, with the highest prevalence in Guinea (47.9%), Kenya (38.8%), Honduras (36.8%) and Mozambique (32.1%). These estimates are 3 or more times higher than the world average (Table 10). Specific prevalence for each GAVI country is given in Annex 9.

Table 10: Prevalence of HPV among women with normal cervical cytology in the World, Less and More developed regions and GAVI countries

Region	Number of women tested	HPV prevalence	95%CI
World	436,430	11.4	11.3-11.5
Less developed regions	120,008	14.3	14.1-14.5
More developed regions	315,573	10.3	10.2-10.4
GAVI countries (*)	31,758	11.5	11.2-11.9

The samples for HPV testing come from cervical specimens (fresh / fixed biopsies or exfoliated cells).
95% CI: 95% Confidence Interval
(*) Information available for 13 GAVI countries (10 GAVI-eligible and 3 GAVI-graduating). GAVI-eligible countries: GNI per capita <= 1,500U$; GAVI-graduating countries: GNI per capita > 1,500U$ but they have a final opportunity in 2011 to apply for GAVI support.
Data sources: Bruni et al. 2010.

Figure 22: Age-specific HPV prevalence in women with normal cervical cytology in GAVI countries, Less and More developed regions



The majority of HPV infections in young women are self-limited. As a result, HPV prevalence picks in young women and declines at older ages.

This decline seems to be lower in GAVI countries when compared to more developed and less developed regions.

It is unknown why, in some regions, a second peak of HPV detection is observed.

Data sources: Bruni et al. 2010.

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

KEY STATS

HPV prevalence increases with severity of the lesion.

Worldwide HPV16/18 is estimated to account for **4%** in women with **normal cervical cytology, 24%** in **low-grade cervical lesions, 51%** in **high-grade cervical lesions** and **71%** in **invasive cervical cancer**.

Similar percentages are observed in **GAVI countries**.

Geographically widespread data on HPV type distribution is essential for estimating the impact of HPV vaccines on cervical cancer and cervical cancer screening programs.

HPV distribution is consistent across cervical cancer in all the world regions and particularly with respect to both HPV16 and 18. HPV16/18 is estimated to account for 4% in women with normal cytology, 24% in low-grade cervical lesions, 51% in high-grade cervical lesions and over 70% in invasive cervical cancer, with similar percentages in less developed regions, more developed regions and GAVI countries (Table 11). Specific prevalence estimates for each GAVI country can be found in Annex 10.

Figure 23 shows the prevalence of the most common HPV types in women with normal cervical cytology, low-grade cervical lesions and high-grade cervical lesions. Prevalences of HPV types in GAVI countries rank in a slightly different order when compared to those in more developed and less developed regions, although information is only available in a few GAVI countries.

Among women with invasive cervical cancer, the 8 most common HPV types worldwide, with specific rank order, are HPV16, 18, 33, 45, 31, 58, 52 and 35. HPV16 is consistently the most common type and HPV18 is generally the second most common type. The other HPV types are also quite similar across world regions but the relative importance of each HPV type appears to differ by region.

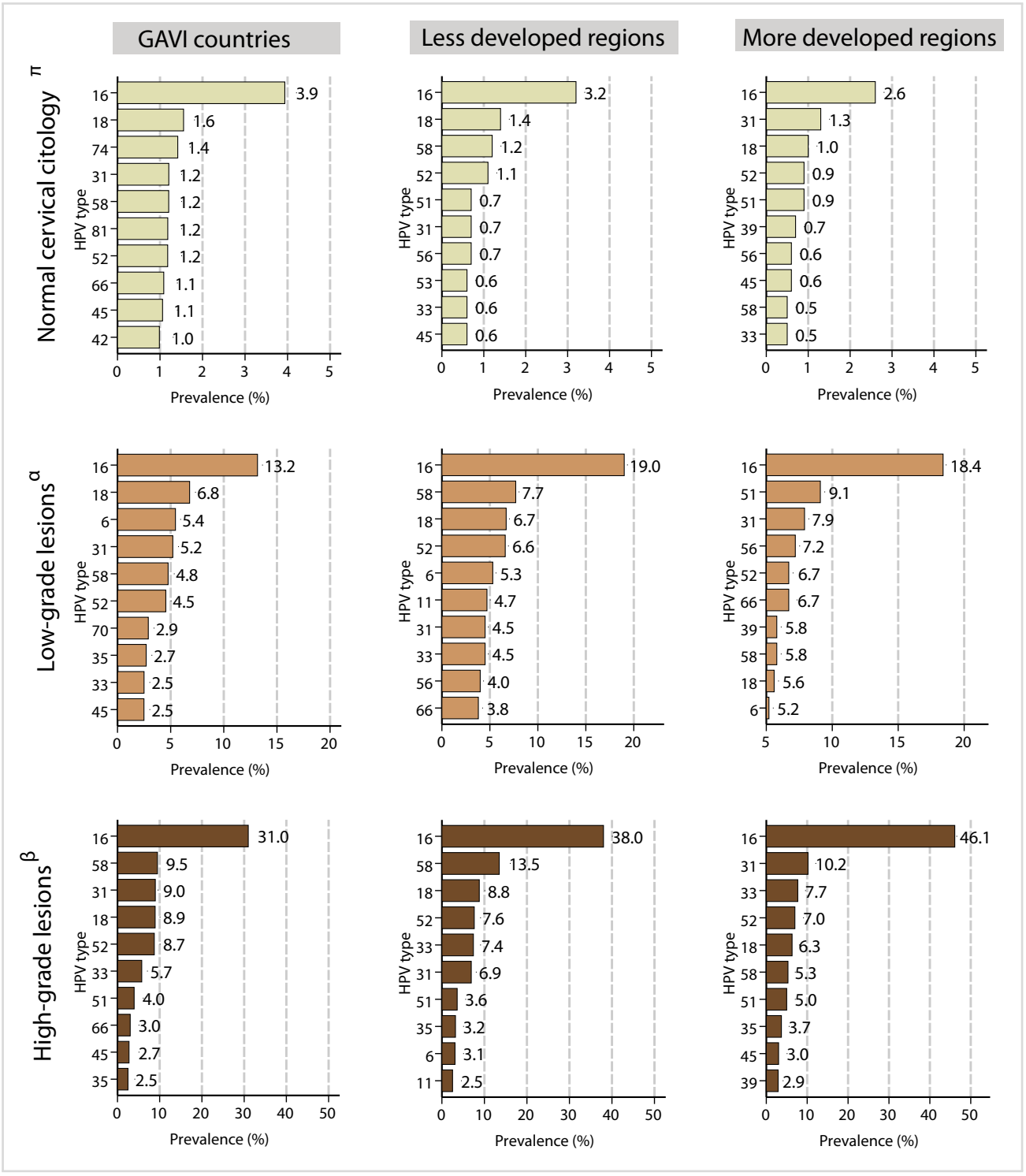
HPV type distribution also varies between squamous cell carcinoma (SCC) and adenocarcinoma (ADC), with HPV16 identified more often in SCC than in ADC, and HPV18 and 45 identified more often in ADC than SCC. Prevalence of HPV16, 18 and 45, by histology, seems to be consistent when comparing GAVI countries with less developed and more developed regions. For ADC, a slightly greater importance for 18 is noted in GAVI countries, and for SCC a slightly higher importance for 45 is noted in GAVI countries compared to less developed and more developed regions (Figure 24). HPV type-specific prevalence in GAVI countries, by lesion and histology, can be found in Table 12 and Table 13.

Table 11: Prevalence of HPV16/18 in women with normal cervical cytology, precancerous cervical lesions and invasive cervical cancer in the World, Less and More developed regions and GAVI countries

	Normal cytology		Low-grade lesions$^{\alpha}$		High-grade lesions$^{\beta}$		Cervical cancer	
	No. tested	HPV Prev % (95%CI)	No. tested	HPV Prev % (95%CI)	No. tested	HPV Prev % (95%CI)	No. tested	HPV Prev % (95%CI)
World	218,339	3.8 (3.7-3.9)	14,762	24.3 (23.6-25.0)	14,901	51.1 (50.3-51.9)	22,826	70.9 (70.3-71.5)
Less developed regions	55,381	4.6 (4.4-4.8)	3,048	25.7 (24.1-27.3)	3,801	46.8 (45.2-48.4)	12,500	71.0 (70.2-71.8)
More developed regions	162,958	3.6 (3.5-3.7)	11,754	24.0 (23.2-24.8)	11,100	52.4 (51.5-53.3)	10,326	70.8 (69.9-71.7)
GAVI countries (*)	13,122	5.5 (5.1-5.9)	532	19.9 (16.6-23.6)	170	39.9 (35.2-44.7)	2,441	73.8 (72.0-75.6)

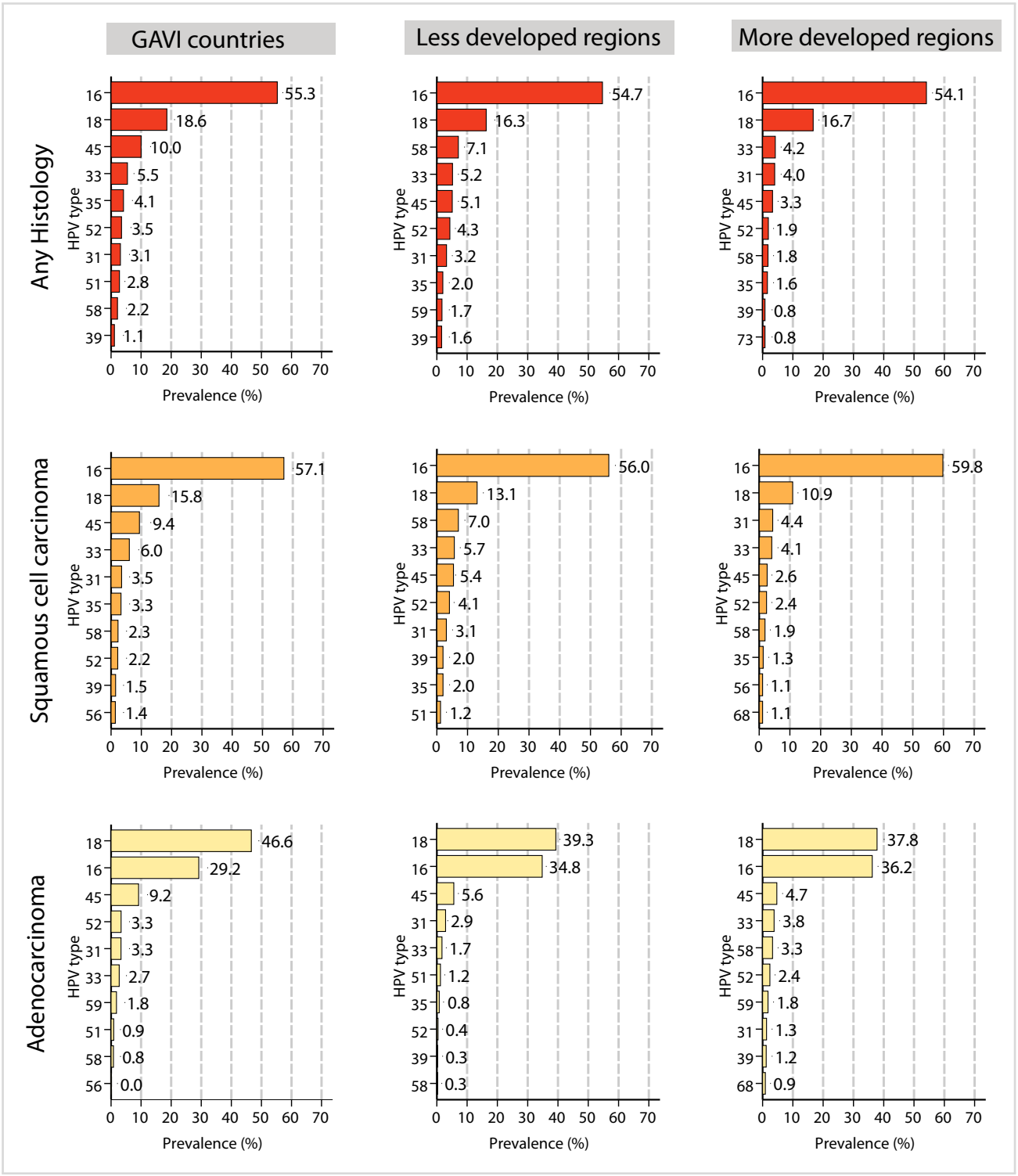
(*) Information about HPV 16/18 prevalence is found in 17 GAVI countries for invasive cervical cancer, 10 GAVI countries for normal cytology, 7 GAVI countries for high-grade cervical lesions and 8 GAVI countries for low-grade cervical lesions.
The samples for HPV testing come from cervical specimens (fresh / fixed biopsies or exfoliated cells).
95% CI: 95% Confidence Interval.
$^{\alpha}$ Low-grade lesions: LSIL or CIN-1
$^{\beta}$ High-grade lesions: CIN-2, CIN-3, CIS or HSIL
Data sources: Bruni et al. 2010; Clifford et al. 2005; Clifford et al. 2003:89; Smith et al. 2007; Clifford et al. 2003;88; Clifford et al. 2008.

Figure 23: Ten most frequent HPV types among women with normal cervical cytology, low-grade cervical lesions and high-grade cervical lesions in GAVI countries, Less and More developed regions



HPV specific prevalence include both single and multiple infections, and for this reason, the total sum of prevalence by HPV type can exceed 100%. Prevalence of multiple infections, when available, varies widely by region and country.
The samples for HPV testing come from cervical specimens (fresh / fixed biopsies or exfoliated cells).
$^{\pi}$ Information available for 10 GAVI countries.
$^{\alpha}$ Information available for 8 GAVI countries.
$^{\beta}$ Information available for 7 GAVI countries.
Data sources: Bruni et al. 2010; Clifford et al. 2005; Clifford et al. 2003:89; Smith et al. 2007.

Figure 24: Ten most common cervical cancer HPV types in women with invasive cervical cancer by histology in GAVI countries, Less and More developed regions



Information of HPV prevalence is available in 17 GAVI countries.
The samples for HPV testing come from cervical specimens (fresh / fixed biopsies or exfoliated cells).
Data sources: Clifford et al. 2003;88; Clifford et al. 2008.

Table 12: Type-specific HPV prevalence in women with normal cervical cytology, precancerous cervical lesions and invasive cervical cancer in GAVI countries

HPV	Normal cytology		Low-grade lesions$^{\alpha}$		High-grade lesions$^{\beta}$		Cervical cancer	
	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	10,452	0.4 (0.3-0.5)	439	5.4 (3.5-8.0)	293	2.4 (1.0-4.9)	1,785	0.4 (0.2-0.8)
11	10,452	0.4 (0.3-0.6)	402	2.0 (0.9-3.9)	293	2.0 (0.8-4.4)	1,691	0.6 (0.3-1.1)
13	-	- -	-	- -	-	- -	-	- -
16	13,122	3.9 (3.6-4.3)	532	13.2 (10.4-16.3)	426	31.0 (26.6-35.6)	2,441	55.3 (53.3-57.2)
18	13,122	1.6 (1.4-1.8)	532	6.8 (4.8-9.2)	426	8.9 (6.4-12.0)	2,441	18.6 (17.0-20.2)
26	9,014	0.2 (0.1-0.3)	-	- -	-	- -	-	- -
30	3,393	0.4 (0.2-0.6)	-	- -	-	- -	-	- -
31	9,683	1.2 (1.0-1.4)	481	5.2 (3.4-7.6)	401	9.0 (6.4-12.2)	2,269	3.1 (2.5-3.9)
32	3,393	0.1 (0.0-0.3)	-	- -	-	- -	-	- -
33	9,683	0.9 (0.8-1.2)	481	2.5 (1.3-4.3)	401	5.7 (3.7-8.5)	2,147	5.5 (4.5-6.5)
34	7,261	0.1 (0.0-0.2)	-	- -	-	- -	-	- -
35	9,683	0.9 (0.8-1.2)	481	2.7 (1.4-4.6)	401	2.5 (1.2-4.5)	2,147	4.1 (3.3-5.1)
39	9,683	0.5 (0.4-0.7)	439	1.4 (0.5-3.0)	378	2.1 (0.9-4.1)	1,840	1.1 (0.7-1.7)
40	9,683	0.2 (0.2-0.4)	-	- -	-	- -	-	- -
42	9,683	1.0 (0.8-1.2)	-	- -	-	- -	-	- -
43	7,399	0.4 (0.3-0.6)	-	- -	-	- -	-	- -
44	9,683	0.4 (0.3-0.6)	-	- -	-	- -	-	- -
45	9,683	1.1 (0.9-1.3)	481	2.5 (1.3-4.3)	401	2.7 (1.4-4.9)	2,267	10.0 (8.8-11.3)
51	9,683	0.8 (0.6-1.0)	439	2.1 (0.9-3.9)	378	4.0 (2.2-6.5)	1,991	2.8 (2.1-3.6)
52	9,683	1.2 (1.0-1.4)	481	4.6 (2.9-6.8)	401	8.7 (6.2-11.9)	2,257	3.5 (2.8-4.3)
53	9,683	0.6 (0.4-0.7)	-	- -	-	- -	-	- -
54	9,683	0.5 (0.3-0.6)	-	- -	-	- -	-	- -
55	596	0.0 (0.0-0.6)	-	- -	-	- -	-	- -
56	9,683	0.9 (0.7-1.1)	439	2.3 (1.1-4.1)	378	1.9 (0.7-3.8)	2,118	1.1 (0.7-1.6)
57	9,014	0.0 (0.0-0.0)	-	- -	-	- -	-	- -
58	9,683	1.2 (1.0-1.4)	481	4.8 (3.1-7.1)	401	9.5 (6.8-12.8)	2,257	2.2 (1.6-2.9)
59	9,683	0.4 (0.3-0.5)	439	1.4 (0.5-3.0)	378	0.8 (0.2-2.3)	2,094	1.1 (0.7-1.6)
61	7,188	0.0 (0.0-0.1)	-	- -	-	- -	-	- -
62	1,054	0.3 (0.1-0.8)	-	- -	-	- -	-	- -
64	596	0.0 (0.0-0.6)	-	- -	-	- -	-	- -
66	9,683	1.1 (0.9-1.3)	288	2.4 (1.0-4.9)	329	3.0 (1.5-5.5)	2,075	0.3 (0.1-0.6)
67	4,447	0.6 (0.4-0.9)	-	- -	-	- -	-	- -
68	9,683	0.3 (0.2-0.4)	439	1.8 (0.8-3.6)	401	2.2 (1.0-4.2)	1,682	0.9 (0.5-1.5)
69	4,447	0.3 (0.2-0.6)	-	- -	-	- -	-	- -
70	7,857	0.7 (0.5-0.9)	274	2.9 (1.3-5.7)	204	2.5 (0.8-5.6)	1,685	0.1 (0.0-0.3)
71	7,188	0.0 (0.0-0.1)	-	- -	-	- -	-	- -
72	7,188	0.4 (0.3-0.6)	-	- -	-	- -	-	- -
73	8,827	0.5 (0.3-0.6)	179	0.6 (0.0-3.1)	192	0.0 (0.0-1.9)	1,297	0.6 (0.3-1.2)
74	1,265	1.4 (0.8-2.2)	-	- -	-	- -	-	- -
81	6,730	1.2 (0.9-1.5)	-	- -	-	- -	-	- -
82	9,014	0.3 (0.2-0.4)	164	0.0 (0.0-2.2)	147	1.3 (0.2-4.8)	1,028	0.2 (0.0-0.7)
83	9,014	0.4 (0.2-0.5)	-	- -	-	- -	-	- -
84	9,014	0.1 (0.1-0.2)	-	- -	-	- -	-	- -
85	1,594	0.0 (0.0-0.2)	-	- -	-	- -	-	- -
86	3,393	0.0 (0.0-0.1)	-	- -	-	- -	-	- -
89	4,833	0.3 (0.2-0.5)	-	- -	-	- -	-	- -
90	3,393	0.8 (0.5-1.1)	-	- -	-	- -	-	- -
91	-	- -	-	- -	-	- -	-	- -

The samples for HPV testing come from cervical specimens (fresh / fixed biopsies or exfoliated cells).
95% CI: 95% Confidence Interval.
$^{\alpha}$ Low-grade lesions: LSIL or CIN-1
$^{\beta}$ High-grade lesions: CIN-2, CIN-3, CIS or HSIL
Data sources: Bruni et al. 2010; Clifford et al. 2005; Clifford et al. 2003:89; Smith et al. 2007; Clifford et al. 2003;88; Clifford et al. 2008.

Table 13: Type-specific HPV prevalence among invasive cervical cancer cases in GAVI countries, by histology

HPV	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	1,785	0.4 (0.2-0.8)	1,178	0.1 (0.0-0.5)	104	0.0 (0.0-3.5)	503	1.2 (0.4-2.6)
11	1,691	0.6 (0.3-1.1)	1,178	0.4 (0.1-1.0)	104	0.0 (0.0-3.5)	409	1.2 (0.4-2.8)
16	2,441	55.3 (53.3-57.2)	1,686	57.1 (54.7-59.4)	120	29.2 (21.2-38.2)	635	55.4 (51.5-59.3)
18	2,441	18.6 (17.0-20.2)	1,686	15.8 (14.1-17.7)	120	46.7 (37.5-60.0)	635	20.4 (17.4-23.8)
31	2,269	3.1 (2.5-3.9)	1,574	3.5 (2.6-4.5)	120	3.3 (0.9-8.3)	575	2.0 (1.1-3.6)
33	2,147	5.5 (4.5-6.5)	1,462	6.0 (4.9-7.4)	110	2.7 (0.6-7.8)	575	4.5 (3.0-6.6)
35	2,147	4.1 (3.3-5.1)	1,462	3.3 (2.4-4.3)	110	0.0 (0.0-3.3)	575	7.1 (5.2-9.5)
39	1,840	1.1 (0.7-1.7)	1,326	1.5 (0.9-2.3)	107	0.0 (0.0-3.4)	407	0.2 (0.0-1.4)
45	2,267	10.0 (8.8-11.3)	1,615	9.4 (8.0-10.9)	120	9.2 (4.7-15.8)	532	12.2 (9.6-15.3)
51	1,991	2.8 (2.1-3.6)	1,421	1.4 (0.8-2.1)	110	0.9 (0.0-5.0)	460	7.8 (5.5-10.7)
52	2,257	3.5 (2.8-4.3)	1,615	2.2 (1.6-3.1)	120	3.3 (0.9-8.3)	522	7.5 (5.4-10.1)
56	2,118	1.1 (0.7-1.6)	1,479	1.4 (0.9-2.2)	117	0.0 (0.0-3.1)	522	0.4 (0.0-1.4)
58	2,257	2.2 (1.6-2.9)	1,615	2.3 (1.6-3.1)	120	0.8 (0.0-4.6)	522	2.1 (1.1-3.7)
59	2,094	1.1 (0.7-1.6)	1,462	1.0 (0.6-1.7)	110	1.8 (0.2-6.4)	522	1.0 (0.3-2.2)
66	2,075	0.3 (0.1-0.6)	1,479	0.1 (0.0-0.5)	117	0.0 (0.0-3.1)	479	0.6 (0.1-1.8)
68	1,682	0.9 (0.5-1.5)	1,326	1.0 (0.5-1.7)	107	0.0 (0.0-3.4)	249	0.8 (0.1-2.9)
70	1,685	0.1 (0.0-0.3)	1,242	0.0 (0.0-1.3)	107	0.0 (0.0-3.4)	336	0.3 (0.0-1.6)
73	1,297	0.6 (0.3-1.2)	1,050	0.6 (0.2-1.2)	70	0.0 (0.0-5.1)	177	1.1 (0.1-4.0)
82	1,028	0.2 (0.0-0.7)	852	0.1 (0.0-0.7)	50	0.0 (0.0-7.1)	126	0.8 (0.0-4.3)

The samples for HPV testing come from cervical specimens (fresh / fixed biopsies or exfoliated cells).
95% CI: 95% Confidence Interval.
Data sources: Clifford et al. 2003;88; Clifford et al. 2008.

4.2 HPV burden in anogenital cancers other than cervix

The association of HPV DNA with several different anogenital cancers other than cervical cancer has been reported for the vulva, vagina, anus and penis. HPV may cause 88% of anal cancers and 70% of vaginal cancers, whereas HPV attribution for penile and vulvar cancers is lower, at 50% and 43%, respectively (*Martel et al. 2012*).

Table 14: Prevalence of HPV in anogenital cancers other than cervix in the world

	HPV prevalence		HPV 16/18 prevalence	
	N tested	% (95%CI)	N tested	% (95%CI)
Anal cancer	1,197	75.8 (73.2-78.2)	1,164	73.3 (70.6-75.8)
Vulvar cancer	1,664	40.5 (38.1-42.9)	1,604	36.1 (33.7-38.5)
Vaginal cancer	172	73.3 (66.0-79.7)	172	57.6 (49.8-65.0)
Penile cancer	1,669	49.1 (46.7-51.5)	1,669	37.5 (35.2-39.9)

95% CI: 95% Confidence Interval.
Note: HPV prevalence is highly variable according to the histology.
Data source: Ongoing data compiled by WHO/ICO HPV Information Centre, based on De Vuyst et al. 2009 meta-analysis; Miralles-Guri et al. 2009.

4.2.1 Anal cancer

Anal cancer is similar to cervical cancer with respect to overall HPV DNA positivity, with 88% of cases associated with HPV infection worldwide (*Martel et al. 2012*). HPV16 is the most common detected type followed by HPV18. HPV16/18 represents 73% of all HPV positive tumours. HPV DNA is also detected in the majority of precancerous anal intraepithelial neoplasia (AIN) lesions and the prevalence of HPV increases with the severity of the lesion.

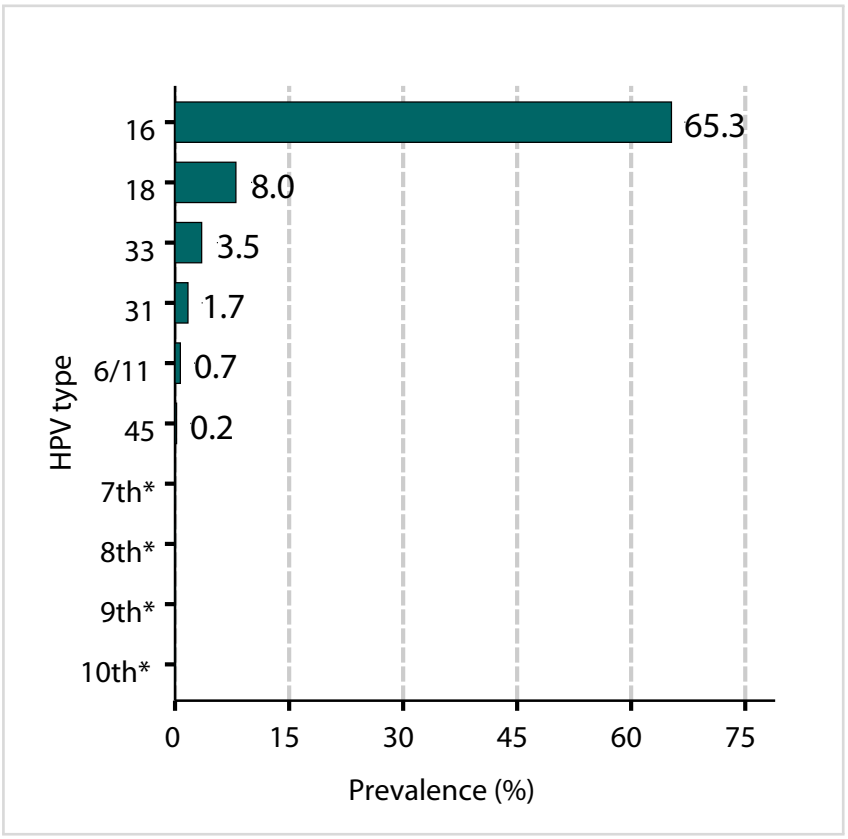
In this section, the burden of HPV among cases of anal cancers in the world is presented. Specific information is not available for any GAVI country.

Table 15: HPV prevalence among cases of anal cancer in the world

	World	
	N tested	**% (95%CI)**
Adenocarcinoma	49	16.3 (7.3-29.7)
Basaloid/Cloacogenic SCC	235	89.8 (85.2-93.3)
Keratinizing SCC	212	74.1 (67.6-79.8)
Unespecified SCC	671	78.2 (74.9-81.3)
Others	30	20.0 (7.7-38.6)
Any Histology	1,197	75.8 (73.2-78.2)
Female	584	85.6 (82.5-88.4)
Male	255	74.1 (68.3-79.4)
Unspecified	358	60.9 (55.6-66.0)

SCC, Squamous cell carcinoma; 95% CI: 95% Confidence Interval.
Data source: Ongoing data compiled by WHO/ICO HPV Information Centre, based on De Vuyst et al. 2009 meta-analysis.

Figure 25: Ten most frequent HPV types in anal cancer in the world



* Not available. No more types were tested or positive.
Data source: Ongoing data compiled by WHO/ICO HPV Information Centre, based on De Vuyst et al. 2009 meta-analysis.

4.2.2 Vulvar cancer

HPV attribution for vulvar cancer is 43% worldwide (*Martel et al. 2012*). Vulvar cancer has two distinct histological patterns with two different risk factor profiles and different HPV attribution: (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. HPV16 accounts for 85% of HPV-positive vulvar cancers. HPV prevalence is higher in VIN than in invasive vulvar cancers.

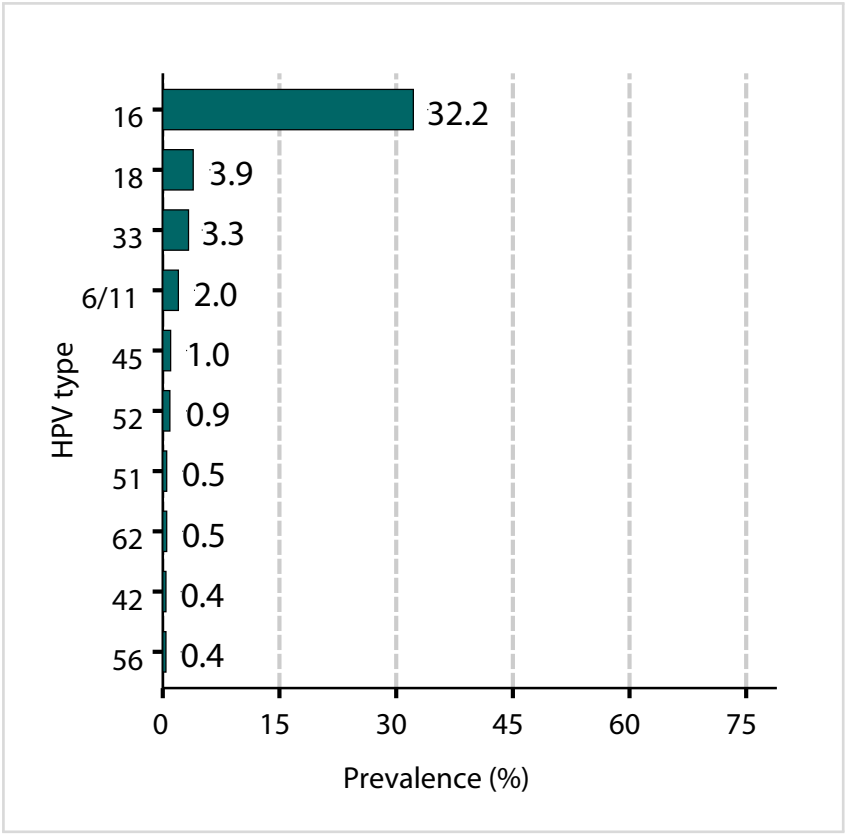
In this section, the HPV burden among cases of vulvar cancers in the world. Specific information is not available for any GAVI country.

Table 16: HPV prevalence among cases of vulvar cancer in the world

	World	
	N tested	**% (95%CI)**
Any Histology	1,664	40.5 (38.1-42.9)
Adenocarcinoma	2	0.0 (0.0-84.2)
Keratinizing SCC	571	19.1 (15.9-22.6)
Unespecified SCC	855	46.7 (43.3-50.1)
Verrucous SCC	3	66.7 (0.9-99.9)
Warty-Basaloid SCC	233	70.4 (64.1-76.2)

SCC, Squamous cell carcinoma; 95% CI: 95% Confidence Interval.
Data source: Ongoing data compiled by WHO/ICO HPV Information Centre, based on De Vuyst et al. 2009 meta-analysis.

Figure 26: Ten most frequent HPV types in vulvar cancer in the world



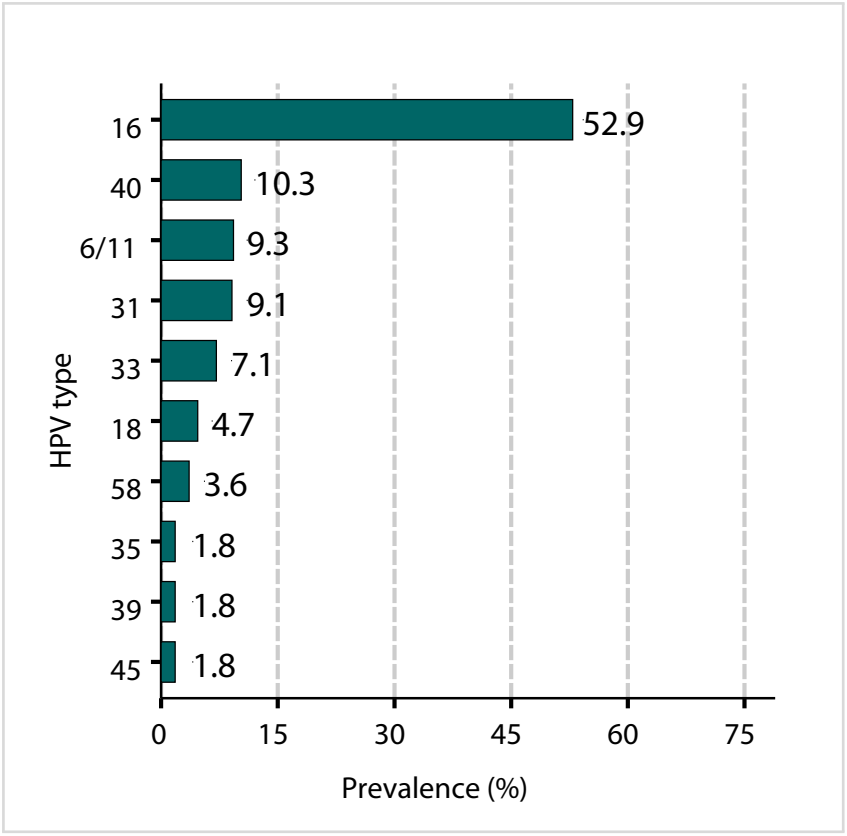
Ongoing data compiled by WHO/ICO HPV Information Centre, based on De Vuyst et al. 2009 meta-analysis.

4.2.3 Vaginal cancer

Most vaginal cancers are squamous cell carcinoma (90%) followed by clear cell adenocarcinomas and melanoma. Women with vaginal cancer are more likely to have a history of other anogenital cancers, particularly of the cervix, and these two carcinomas are frequently diagnosed simultaneously. HPV DNA is detected in 70% of all cancers of vagina with HPV16 being the most frequently detected type (*Martel et al. 2012*).

In this section, the HPV burden among cases of vaginal cancers in the World is presented. Specific information is not available for any GAVI country.

Figure 27: Ten most frequent HPV types in vaginal cancer in the world



Ongoing data compiled by WHO/ICO HPV Information Centre, based on De Vuyst et al. 2009 meta-analysis.

4.2.4 Penile cancer

HPV DNA is detectable in approximately 50% of all penile cancers (*Martel et al. 2012*). Among HPV-related penile tumours, HPV16 is the most common type detected, followed by HPV18 and HPV types 6/11. 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.

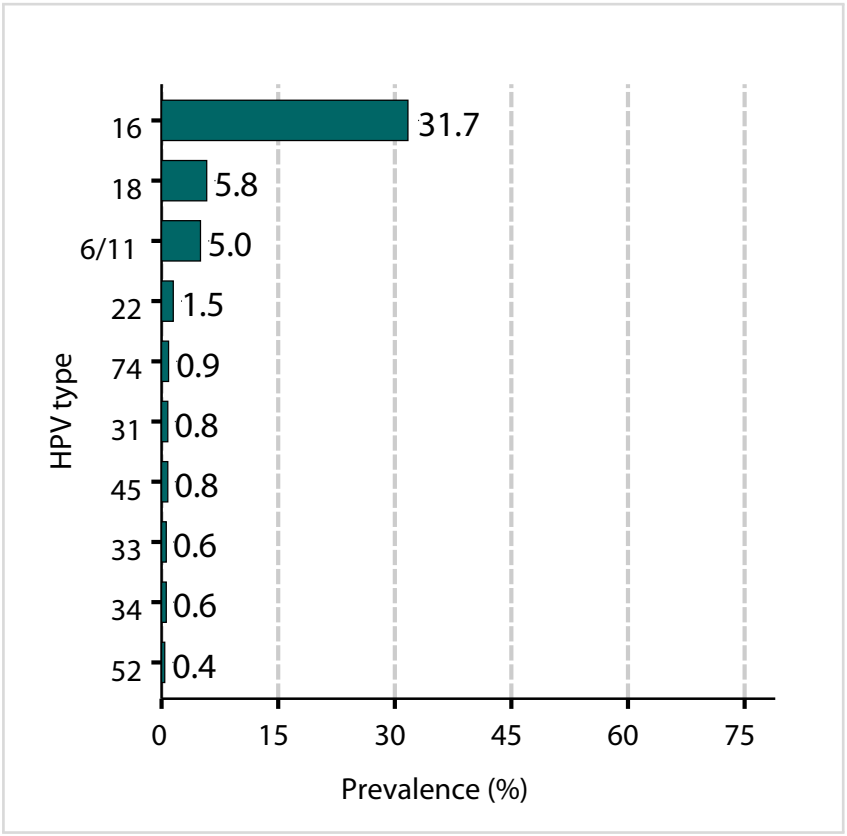
In this section, the HPV burden among cases of penile cancers in the world is presented. Among GAVI countries information was only available for Uganda with only 17 cases determined as unspecified SCC, prevalence 64.7; 95%CI (38.3-85.8).

Table 17: HPV prevalence among cases of penile cancer in the world

	World	
	N tested	**% (95%CI)**
Any Histology	1,669	49.1 (46.7-51.5)
SCC (unspecified)	857	48.3 (45.0-51.7)
Carc. In situ	88	81.8 (72.2-89.2)
Basaloid SCC	46	76.1 (61.2-87.4)
Keratinizing SCC	448	43.5 (38.9-48.3)
Non keratinizing SCC	117	47.9 (38.5-57.3)
Verrucous SCC	57	24.6 (14.1-37.8)
Warty SCC	56	58.9 (45.0-72.0)

SCC, Squamous cell carcinoma; 95% CI: 95% Confidence Interval.
Data sources: Miralles-Guri et al. 2009.

Figure 28: Ten most frequent HPV types in penile cancer in the world



Data sources: Miralles-Guri et al. 2009.

4.3 HPV burden in men

The information to date regarding male HPV infection is limited, and it is primarily derived from studies that examined husbands of females with cervical cancer, cross-sectional studies of selected populations such as individuals with STIs and military recruits, as well as from small prospective studies.

Genital HPV infection in men varies widely, both between and within high- and low-risk groups, and by geographic region. HPV prevalence is high among sexually active men but with considerable variation, from 1-84% among low-risk men and from 2-93% among high-risk men. Compared with that in women, peak HPV prevalence in men is observed at slightly older ages and remains constant or decreases slightly with increasing age, suggesting higher rates of persistent HPV infection or re-infection.

Only four studies on HPV prevalence in three GAVI countries (Uganda, Kenya and India) have been detected (Table 18).

Table 18: Studies on HPV prevalence among men in GAVI countries.

Study	Anatomic sites samples	HPV detection method	HR-HPV tested	Population	Mean or range Age (years)	HPV prevalence Men tested	HPV prevalence % (95% CI)
Tobian (Uganda) 2009	Prepucial cavity	PCR-PGMY09/11	16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 66, 68	Men from a circumcision trial, HIV-negative and seronegative HSV-2, baseline data	15-49	609	62.2 (58.2-66.1)
Ng'ayo (Kenya) 2008	Glans and corona sulcus, shaft of the penis, scrotum and perianal region	PCR-MY09/MY11 HMB01		Men worked in the fishing industry	18-63	250	57.6 (51.2-63.8)
Smith (Kenya) 2002-2005	Glans/coronal sulcus, urethra-wet swab	PCR GP5+/6+		Sexually active male participants in clinical trial of circumcision	17-25	98	54.0 (43.7-64.2)
Gupta* (India)	Coronal sulcus, distal and intrameatal urethra, glans-wet swab, urine	PCR-L1	16, 18	Husbands of women with normal cytology	46.9	30	26.7 (12.2-45.9)

95% CI: 95% Confidence Interval.
(*) No city or date were reported.
Data sources: Tobian et al. 2009; Ng'ayo et al. 2008;Smith et al. 2007; Gupta et al. 2006.

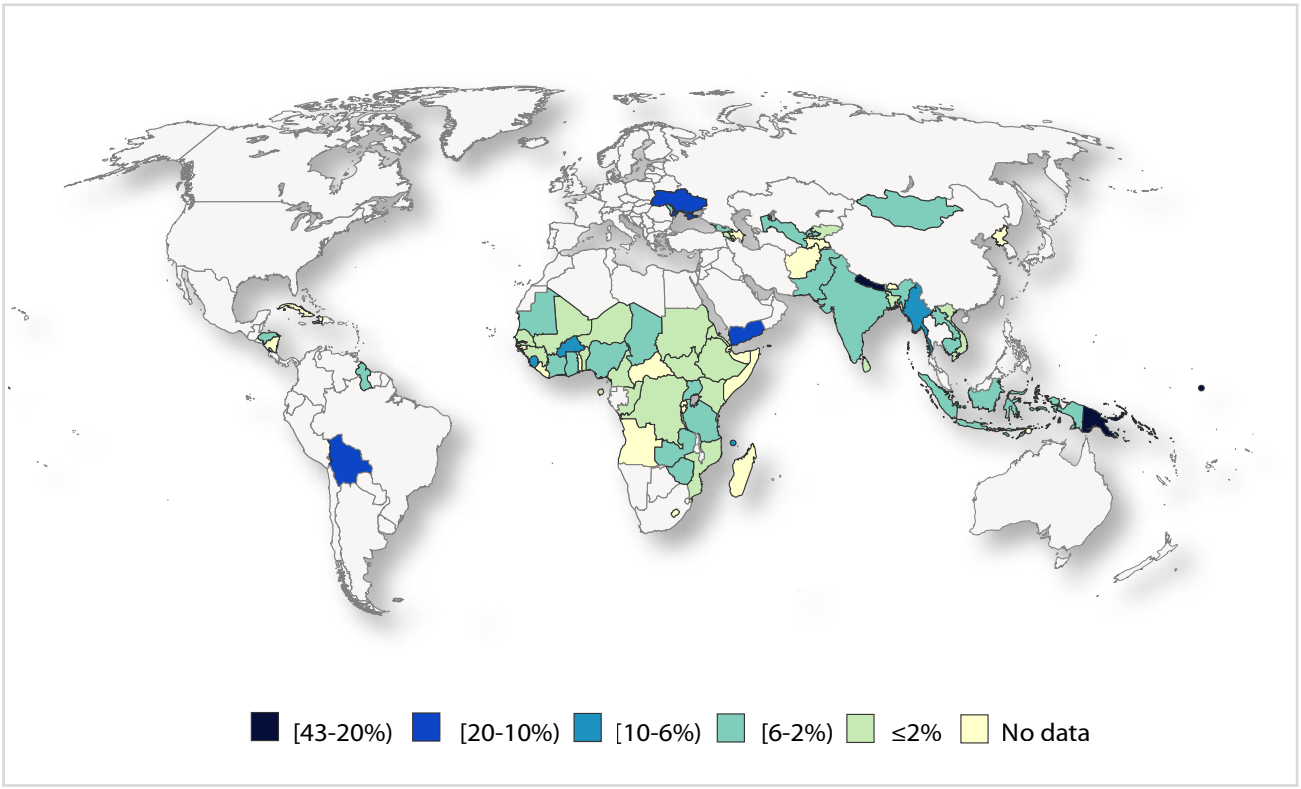
5 Factors contributing to cervical cancer

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, parity (fertility), oral 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.

In this section, the prevalence of smoking, parity, oral contraceptive use, and HIV in GAVI countries are presented.

Current smokers have an increased risk of SCC compared to never smokers. In most GAVI countries, the prevalence of female tobacco smoking is less than 7%. Low prevalence estimates are found in Africa, while high estimates are identified in Kiribati (43%), Papua New Guinea (31%) and Nepal (29%) (Figure 29). Specific prevalence estimates for each GAVI-eligible and GAVI-graduating country can be found in Annex 11.

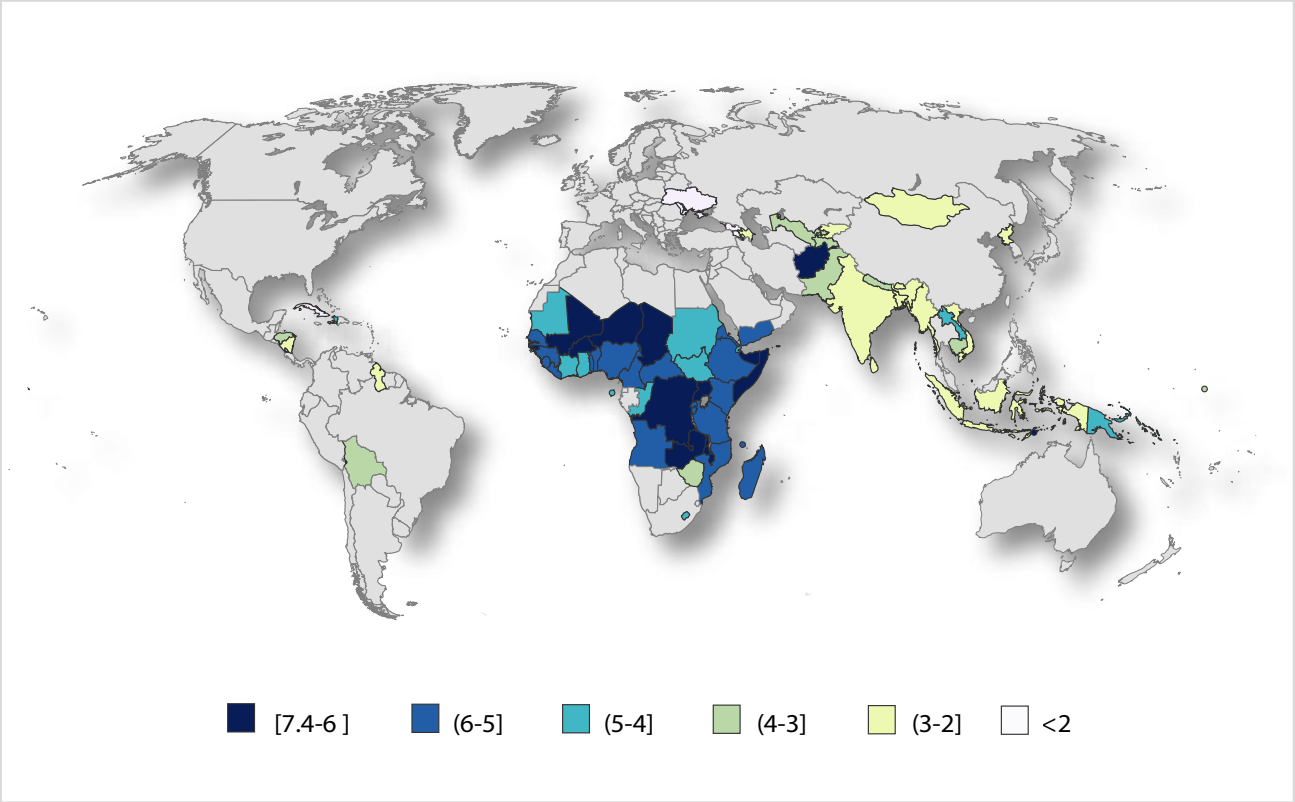
Figure 29: Prevalence of female tobacco smoking in GAVI countries



Data sources: WHO Tobacco 2011.

Number of full-term pregnancies has been associated with an increased risk of invasive cervical cancer, through the maintenance of the transformation zone on the exocervix facilitating the HPV exposure (hormonal factors are also involved). Fertility rates of over 4 children per women are found in 41 GAVI-eligible and 3 GAVI-graduating countries, with especially high rates in Africa. The high estimates are found in Guinea Bisau (7.4), Niger (7.1) and Timor Leste (7.0), and low estimates in Ukraine and Moldova (1.3) (Figure 30). Specific prevalence estimates for each GAVI-eligible and GAVI-graduating country can be found in Annex 11.

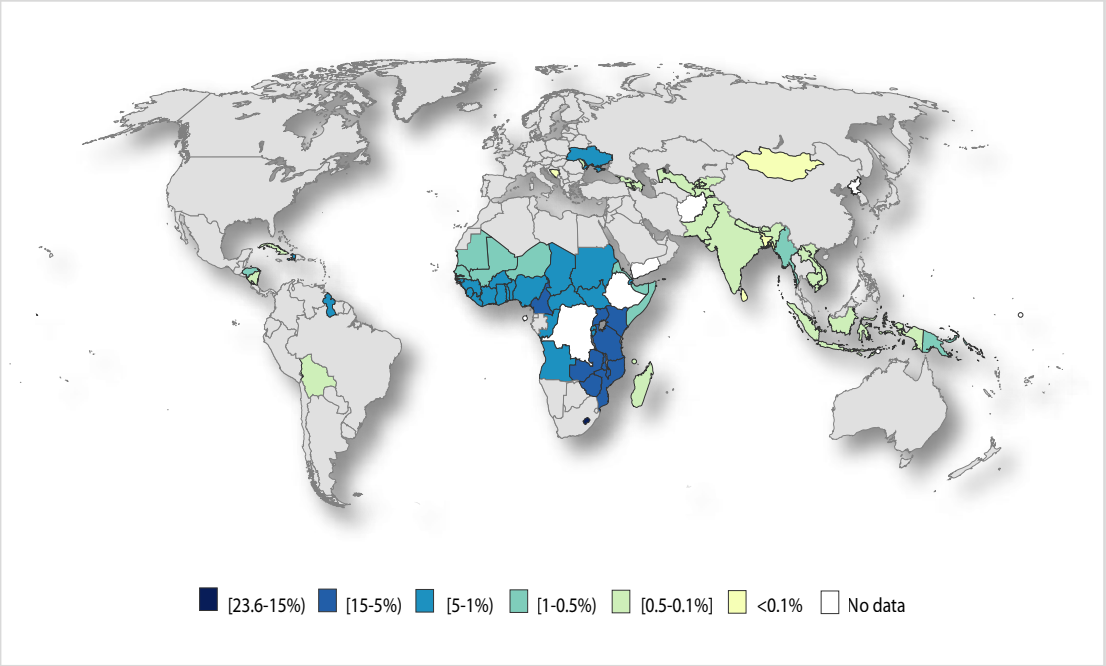
Figure 30: Total fertility rates in GAVI countries



Fertility rate is a proxy measure of parity.
Data sources: United Nations Fertility 2009.

Individuals with HIV-related immunosuppression are known to be at increased risk of HPV anogenital cancers, correlated to the CD4 counts. In GAVI countries, particularly high HIV prevalence is observed in Africa, with the highest prevalences in Lesotho (23.5%), Zimbawe (14.3%) and Zambia (13.5%) (Figure 31). Specific prevalences for each GAVI-eligible and GAVI-graduating country can be found in Annex 11.

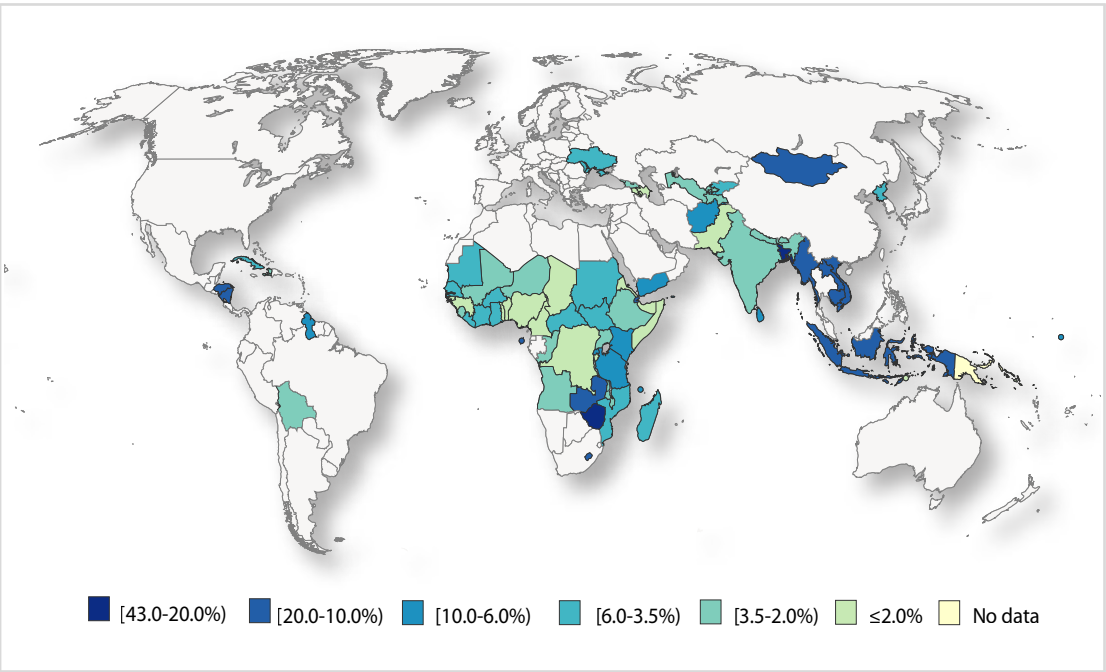
Figure 31: Prevalence of HIV in adults aged 15 to 49 years in GAVI countries



Data sources: UNAIDS/WHO 2010.

The risk of invasive cervical cancer increases with increased duration of oral contraceptive use. In GAVI countries, lower prevalence estimates of oral contraceptive use are usually found in Africa, and higher prevalence ones in Asia and Central America, such as in Zimbabwe (43.0%), Bangladesh (28.5%) and Sao Tome and Principe (15.1%) (Figure 32). Specific prevalence estimates for each GAVI-eligible and GAVI-graduating country can be found in Annex 11.

Figure 32: Prevalence of oral contraceptive use in GAVI countries*



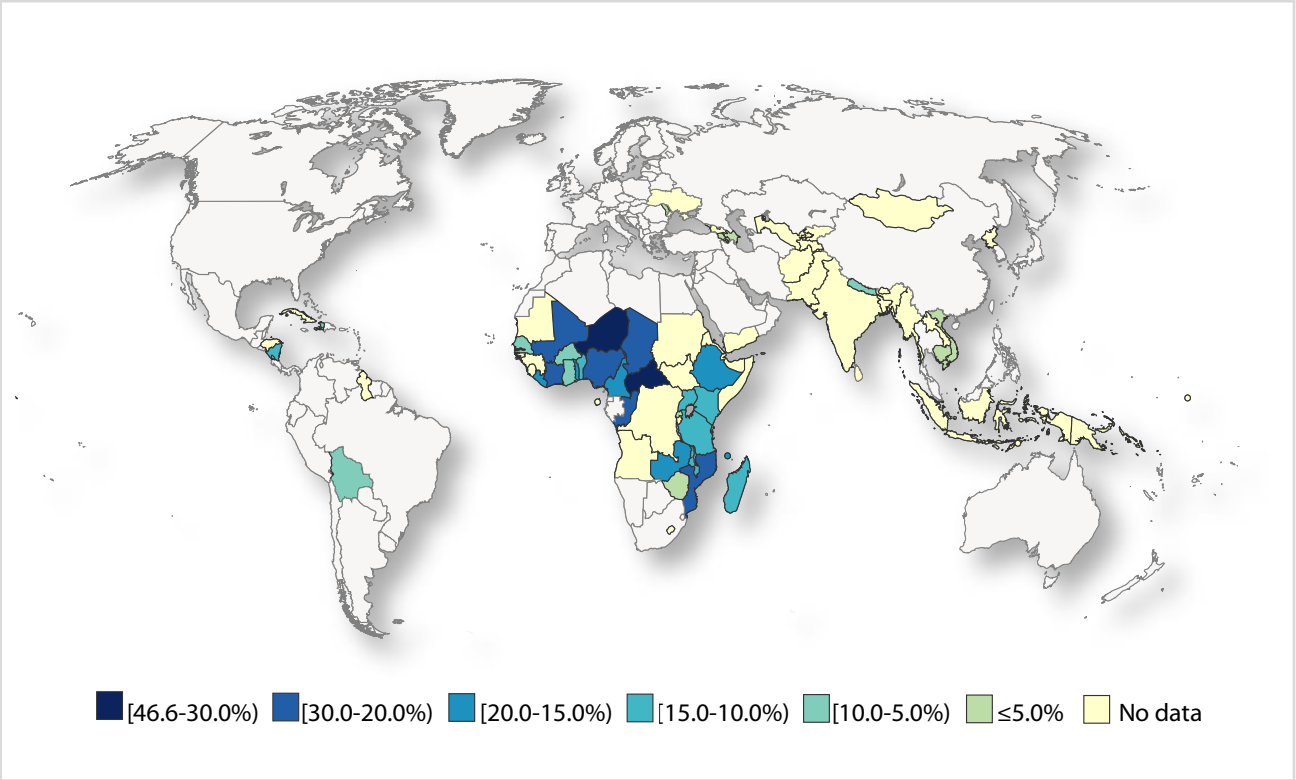
* Among women who are married or in union.
Data sources: United Nations Contraceptive 2011.

6 Reproductive and sexual behaviour

Sexual intercourse is the primary route of transmission of genital HPV infection. Information about sexual and reproductive health behaviour is essential to the design of effective preventive strategies against anogenital cancers. In this section, we describe sexual health indicators that may be used as proxy measures of risk for HPV infection and anogenital cancers.

Several studies have reported that earlier sexual debut is a risk factor for HPV infection, although the reason for this relationship is still unclear. In most GAVI countries with available information, there is a high prevalence of women having sex before the age of 15 years. High prevalence estimates are found in Niger (46.6%) and Central African Republic (30.3%) (Figure 33). Specific prevalence estimates for each GAVI-eligible and GAVI-graduating country can be found in Annex 12.

Figure 33: Proportion of young women (15-24 years) who have had sex before the age of 15 in GAVI countries



Data sources:
Armenia Demographic and Health Survey 2005; Azerbaijan Demographic and Health Survey 2006; Benin Enquete Demographique et de Sante 2006: The HIV Test Data were not scrambled, and are therefore not available for analysis; Bolivia Encuesta Nacional de Demografia y Salud 2003; Burkina Faso Demographic and Health Survey 2003; Cambodia Demographic and Health Survey 2005; Cameroon Demographic and Health Survey 2004; Congo Enquete Demographique et de Sante 2005; Cote d'Ivoire Demographic and Health Survey 1998; Encuesta Nicaraguense de Demografia y Salud 2001; Enquete Demographique et de Sante 2003-2004, Madagascar; Ethiopia Demographic and Health Survey 2005; Ghana Demographic and Health Survey 2003; Haiti Demographic and Health Survey 1994; Kenya Demographic and Health Survey 2003; Liberia Demographic and Health Survey 2007; Malawi Demographic and Health Survey 2004; Mali Enquete Demographique et de Sante 2006, ENDSM-IV; Moldova Demographic and Health Survey 2005; Mozambique Demographic and Health Survey 2003; Nepal Demographic and Health Survey 2006; Nigeria Demographic and Health Survey 2003; Rwanda Demographic and Health Survey 2005; Senegal Demographic and Health Survey 2005; Tanzania Demographic and Health Survey 2004; Chad Enquete Demographique et de Sante 2004; Uganda HIV/AIDS Sero-Behavioural Survey 2004-05; Vietnam Population and AIDS Indicator Survey; Zambia Demographic and Health Survey 2001-2002; Zimbabwe Demographic and Health Survey 2005-06.

7 Preventive strategies

Current patterns of cervical cancer incidence worldwide reflect the combined effect of the underlying risk of the disease and the prevention by effective screening and vaccination. Before the introduction of screening and vaccination programs the incidence of cervical cancer in many of the more developed countries was similar to that in less developed countries today. Rates of cervical cancer incidence and mortality have declined in the last 50 years in many of the more developed countries remaining relatively stable in less developed countries. The lack of an overall decline in less developed countries reflects the absence of screening and vaccination programs or the short coverage achieved when implemented. The impact of control measures in these countries will substantially reduce the global burden of cervical cancer.

It is established that well-organised cervical screening programs 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 preventive strategy. This section presents indicators on basic characteristics and performance of cervical cancer screening, status of HPV vaccine licensure and the prevalence of male circumcision and condom use in the world and GAVI countries.

7.1 Cervical cancer screening practices

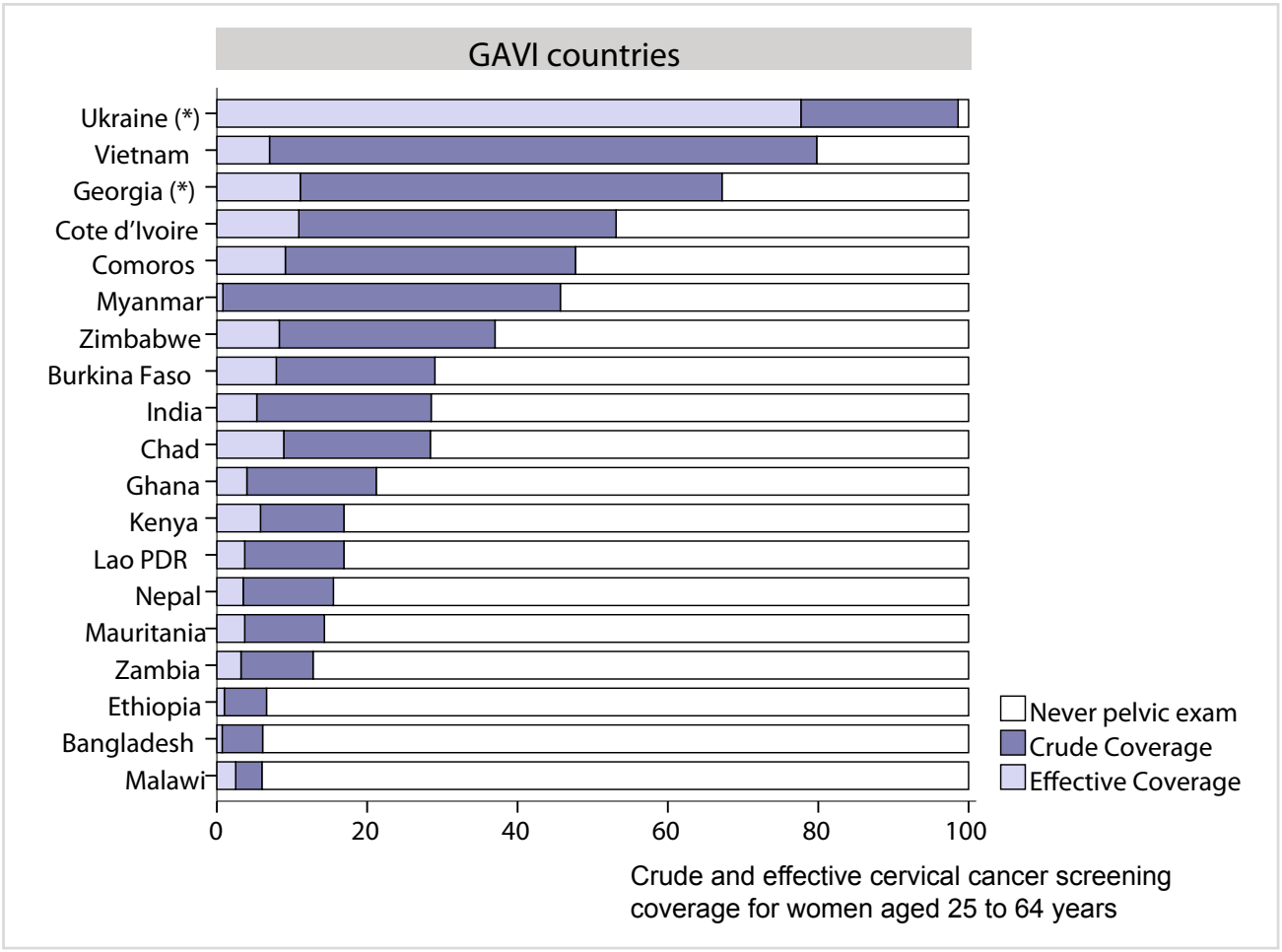
Unlike women in more developed regions, who have access to screening and treatment of cervical cancer, the majority of women in less developed regions, and specifically in GAVI countries, will never be screened and will not receive adequate treatment for cervical cancer, if needed.

There is a wide variation in the level of cervical cancer screening coverage in GAVI countries (Figure 34). Crude coverage (defined as the proportion of eligible women who report that they have had a pelvic exam) across GAVI countries varies from 99% in Ukraine, 80% in Vietnam, 67% in Georgia, 13% in Zambia, 7% in Ethiopia to 6% in Bangladesh and Malawi. Effective coverage (defined as the proportion of eligible women who report that they have had a pelvic exam and Pap smear in the past 3 years) is even lower in GAVI countries. The highest effective coverage is found in Ukraine (78%), followed by Georgia and Cote D'Ivoire (11%); the lowest is found in Bangladesh, Ethiopia, and Myanmar, with 1% or less.

In countries outside of GAVI, most women report having at least one pelvic exam in their lives. In a large number of GAVI countries, the majority of women have never had a pelvic exam. This proportion is largest in Malawi, Bangladesh and Ethiopia, where more than 90% of women report that they have never had a pelvic exam.

It should also be noted that much higher screening coverage values are found in urban areas compared to rural areas (Table 19).

Figure 34: Estimated coverage of cervical cancer screening in GAVI countries



GAVI-eligible countries: GNI per capita <= 1,500U$; GAVI-graduating countries: GNI per capita > 1,500U$ but they have a final opportunity in 2011 to apply for GAVI support.
(*) GAVI graduating countries.
Data sources: Adapted from Gakidou et al. 2008.

Table 19: Estimated coverage of cervical cancer screening within the last 3 years, among women aged 18 to 69 years (general female population), in GAVI countries

Country	Year	Setting	N women	Coverage (%)
Bangladesh	2003	All	2,694	0.4
		Urban	607	1.0
		Rural	2,087	0.2
Burkina Faso	2001-2002	All	2,547	5.5
		Urban	2,130	7.8
		Rural	417	5.1
Chad	2001-2002	All	2,368	5.3
		Urban	541	9.5
		Rural	1,827	4.0
Comoros	2001-2002	All	894	6.3
		Urban	271	7.7
		Rural	623	5.6
Cote d'Ivoire	2001-2002	All	1,342	5.8
		Urban	955	6.9
		Rural	388	3.1
Ethiopia	2001-2002	All	2,516	0.6
		Urban	421	1.6
		Rural	2,095	0.4
Georgia (*)	2001-2002	All	1,465	11.2
		Urban	757	15.4
		Rural	685	6.1
Ghana	2001-2002	All	2,002	2.7
		Urban	920	3.2
		Rural	1,082	2.2
India	2001-2002	All	4,586	2.6
		Urban	499	4.9
		Rural	4,086	2.3
Kenya	2001-2002	All	2,222	3.2
		Urban	880	4.0
		Rural	132	2.6
Lao PDR	2001-2002	All	2,478	2.2
		Urban	519	5.2
		Rural	1,960	1.4
Malawi	2001-2002	All	2,713	2.6
		Urban	383	3.7
		Rural	2,330	2.5
Mauritania	2001-2002	All	1,894	3.2
		Urban	1,156	4.5
		Rural	738	1.0
Myanmar	2001-2002	All	3,005	0.9
		Urban	905	1.9
		Rural	2,100	0.4
Nepal	2001-2002	All	4,300	2.4
		Urban	617	4.7
		Rural	3,683	2.0
Ukraine (*)	2003	All	1,361	66.1
		Urban	933	67.3
		Rural	428	63.7
Vietnam	2001-2002	All	1,792	4.9
		Urban	426	4.5
		Rural	1,336	5.0
Zambia	2001-2002	All	1,948	3.1
		Urban	664	5.7
		Rural	1,284	1.8
Zimbabwe	2001-2002	All	2,090	7.2
		Urban	719	10.8
		Rural	1,370	5.2

Information not available for the other GAVI countries.
GAVI-eligible countries: GNI per capita <= 1,500U$; GAVI-graduating countries: GNI per capita > 1,500U$ but they have a final opportunity in 2011 to apply for GAVI support.
(*) GAVI graduating countries.
Data sources: WHO Surveys 2003.

7.2 HPV vaccination

At present, there are two HPV vaccines, a bivalent (Cervarix©) and a quadrivalent (Gardasil©) HPV vaccine. Both vaccines are composed of HPV L1 proteins that spontaneously self assemble into Virus-like particles (VLPs). Characteristics of both vaccines can be found in Table 20. Cervarix© was designed to prevent infection by HPV16 and 18, the two types that cause 70% of cervical cancer. Gardasil© targets the same two cancer causing types and, in addition, is intended to prevent infection by HPV6 and 11, which cause 75-90% of external genital warts. Both vaccines are prophylactic but not therapeutic, so cervical screening programs are still needed for women already infected or unimmunized with the potential for future infection.

Table 20: Characteristics of HPV vaccines

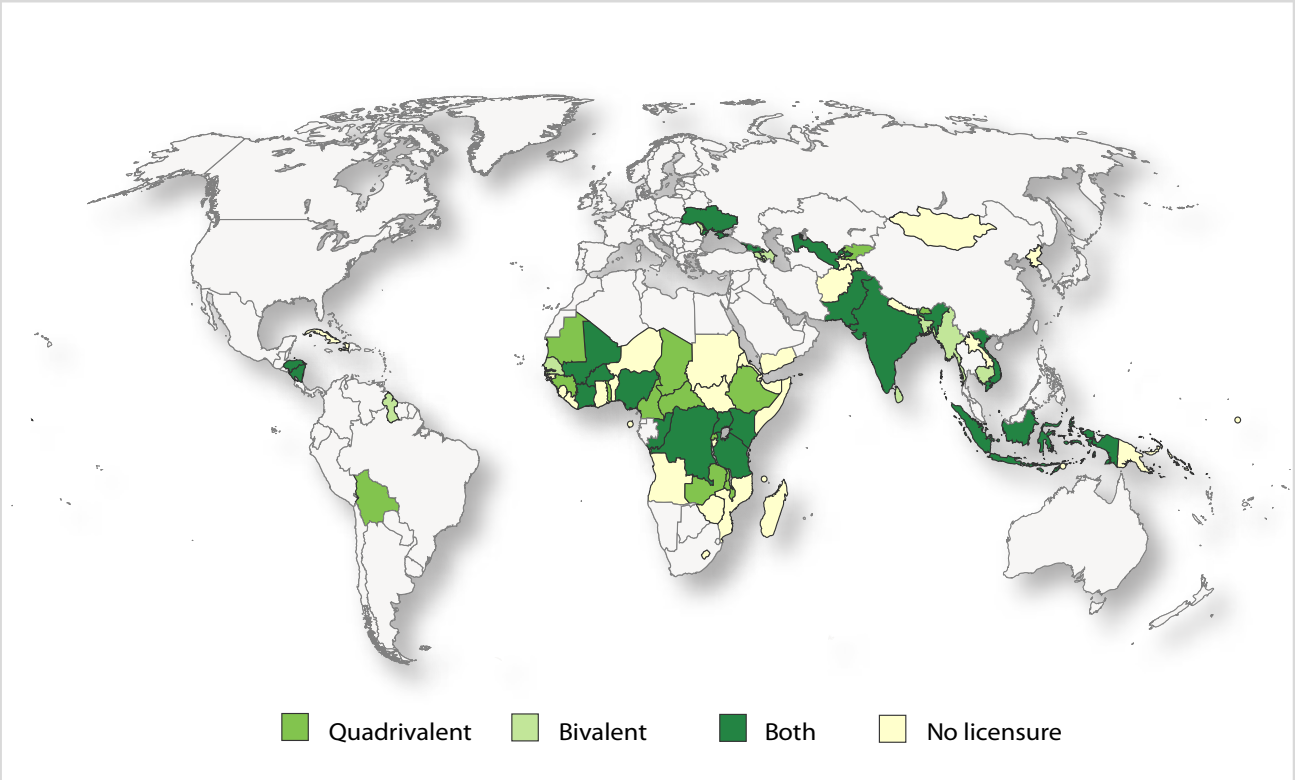
	Gardasil©	**Cervarix©**
Manufacturer	Merck & Co., Inc.	GlaxoSmithKline
HPV types	6/11/16/18	16/18
Dose of L1 protein	20/40/40/20μg	20/20μg
Producer cells	*Saccharomyces cerevisiae* (bread yeast) expressing L1	*Trichoplusia ni* (Hi-5) insect cell line infected with L1 recombinant baculovirus
Adjuvant	225μg aluminum hydroxyphosphate sulfate	500μg aluminum hydroxide, 50μg 3-O-deacylated-4'-monophosphoryl lipid A
Injection schedule	0, 2, 6 months	0, 1, 6 months

Gardasil© (Merck & Co., Inc., Whitehouse Station, NJ USA); Cervarix© (GlaxoSmithKline Biologicals, Rixensart, Belgium).

7.2.1 HPV vaccine licensure

The women at highest risk of death from cervical cancer have the least access to HPV vaccines. Historically, people in less developed countries have to wait decades before new vaccines become available. In 2011, most GAVI countries do not have HPV vaccine licensured yet (either bivalent or quadrivalent). In June 2011, 27 GAVI-eligible countries and 11 GAVI-graduating countries had licensed at least one of the vaccines (Figure 35).

Figure 35: HPV vaccine licensure status in GAVI countries. June 2011



Licensure does not mean that the vaccine is in use in the country. Global HPV vaccine licensure status: June 2011. A world map developed by PATH Seattle in association with GSK and Merck & Co., Inc. showing the countries where one of the two vaccines is licensed and the countries where both vaccines are licensed for use.

7.2.2 HPV vaccine delivery strategies in GAVI countries: demonstration projects conducted by PATH

From 2006 to 2010, PATH (http://www.path.org/), a global nongovernmental health organization, collaborated with the governments of three GAVI countries (India, Uganda and Vietnam) to gather evidence that would support decisions on whether and how to introduce HPV vaccines.

HPV vaccination was conducted in large, geographically distinct areas using existing the Expanded Programme on Immunization (EPI) structures and staff to reflect routine conditions. Strategies used for the delivery of the vaccine were school-based vaccination, health-centre-based vaccination or vaccination combined with other health interventions. All demonstration projects began after the vaccine had been licensed and registered in each country and research was carried out in two phases: formative research and demonstration projects.

A cross-sectional study of HPV vaccination coverage and acceptability was performed in each country. This involved a population-based household survey that was adapted from WHO guidelines for infant immunization surveys. The main outcome measure was the level of HPV vaccination coverage among eligible girls, which was defined as the percentage of households with eligible girls who had been fully vaccinated with three doses of HPV vaccine.

High HPV vaccination coverage was achieved with all delivery strategies except for one of the strategies in Uganda. The coverage achieved through school-based programs ranged from 83-96% (used in Uganda and Vietnam). In India, where a combination of school- and health-centre-based delivery was used, the coverage achieved ranged from 77-88%. The highest coverage was achieved with the health-centre-based program in Vietnam (99% coverage); the lowest coverage was found with the Child Days Plus program in Uganda (53% coverage).

The coverage levels achieved resembled those obtained with vaccination programs in high-income countries. Moreover, the high vaccination coverage achieved in school-based programs suggests that schools can be used to reach young adolescent girls. Nevertheless, ways of reaching girls who are out of school or absent on vaccination days must be considered in any delivery strategy.

This information can assist government deliberations on the introduction of HPV vaccine programs, particularly in low-resource settings *(LaMontagne et al. 2011)*.

7.2.3 Previous experiences with other vaccines in GAVI countries

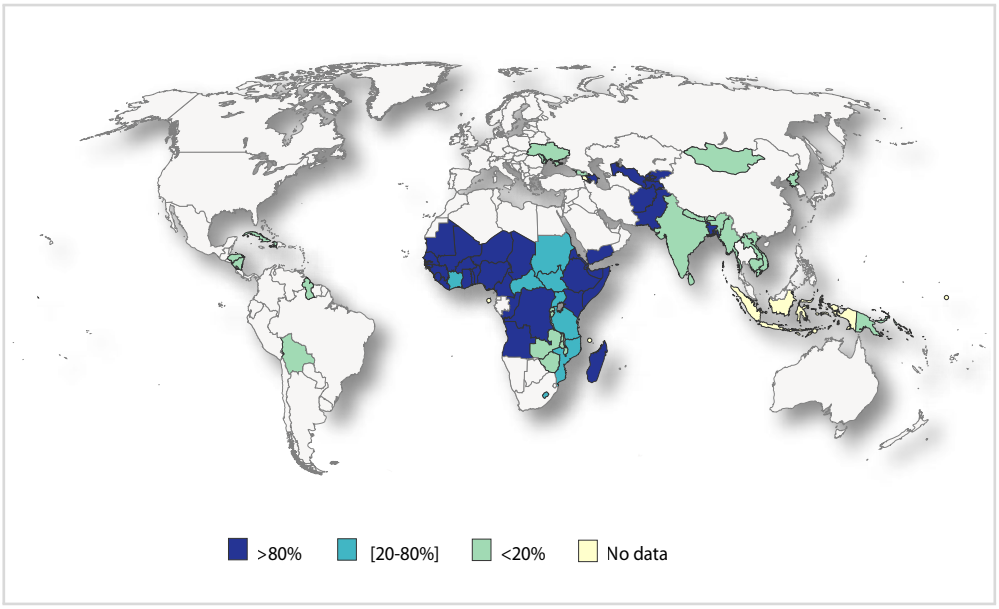
Previous experiences with vaccines supported by the GAVI Alliance have been successful. Immunization coverage in GAVI-supported countries for the required three doses of the diphtheria-tetanus-pertussis vaccine (DTP3) has increased steadily since GAVI's inception, from 65% in 2000 to a historic high of 79% in 2010.

7.3 Male circumcision and condom use

Male circumcision is associated with an increase clearance of HPV. The highest prevalences of male circumcision in GAVI countries (over 80%) are found in some countries in Africa and Central and Southern Asia (Figure 36).

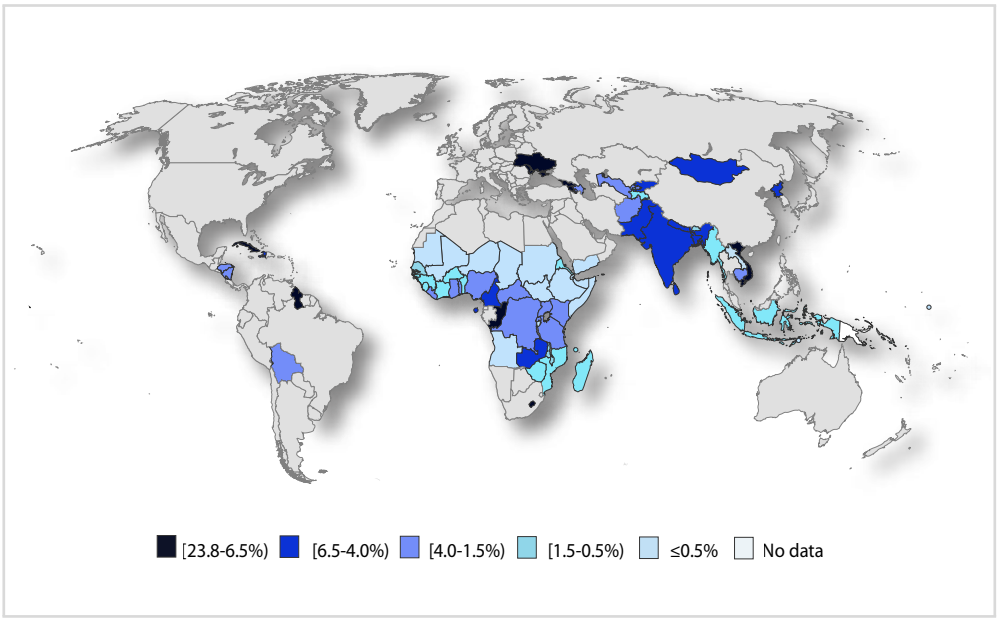
Male condom use appears to offer some protection against HPV infection or progression of cervical cancer lesions, although available data are inconsistent. Prevalence of condom use in GAVI countries is generally low, especially in Africa, with prevalence estimates less than 4% in most countries (Figure 37). Specific prevalence estimates for each GAVI-eligible and GAVI-graduating country can be found in Annex 13.

Figure 36: Prevalence of male circumcision in GAVI countries



Data sources: WHO Male circumcision 2007.

Figure 37: Prevalence of condom use in GAVI countries



Data sources: United Nations Contraceptive Use 2011.

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10 Annexes

Annex 1. World geographical regions

For analytical purposes, the world is divided into either more developed and less developed regions or five continents (Africa, Americas, Asia, Europe, and Oceania). More developed regions are composed of Northern America, Europe, Japan, Australia and New Zealand, and less developed regions are composed of Africa, Americas (excluding Northern America), Caribbean, Central America, South America, Asia (excluding Japan), and Oceania (excluding Australia and New Zealand). Each continent is composed of a number of regions that are grouped geographically. Africa is composed of five regions: Eastern Africa, Middle Africa, Northern Africa, Southern Africa, and Western Africa. The Americas is composed of four regions: the Caribbean, Central America, South America and Northern America. Asia is composed of five regions: Western Asia, Southern Asia, Eastern Asia, South-Eastern Asia and Central Asia. Europe is composed of four regions: Eastern Europe, Western Europe, Southern Europe and Northern Europe. And Oceania is composed of four regions: Australia and New Zealand, Melanesia, Micronesia, and Polynesia. (United Nations Statistics Division, Standard country or area codes and geographical regions for statistical use, http://unstats.un.org/unsd/methods/m49/m49.htm).

Annex 2. Population (in millions) estimates for 2011 in the World, Less and More developed regions and GAVI countries

	Female			Male		
	10-14 years	**15+ years**	**Total**	**10-14 years**	**15+ years**	**Total**
World	290.28	2,562.00	3,456.78	311.20	2,558.55	3,517.26
Less developed regions	257.93	2,024.65	2,819.50	277.19	2,060.62	2,914.16
More developed regions	32.35	537.35	637.28	34.01	497.93	603.10
GAVI-eligible countries (56 countries)	**141.13**	**874.38**	**1,325.75**	**149.03**	**893.84**	**1,369.82**
Afghanistan	2.11	8.39	15.62	2.26	9.03	16.74
Bangladesh	7.79	51.84	74.34	8.21	52.58	76.16
Benin	0.56	2.64	4.61	0.56	2.49	4.49
Burkina Faso	1.05	4.77	8.54	1.09	4.51	8.43
Burundi	0.49	2.75	4.36	0.49	2.59	4.21
Cambodia	0.75	5.11	7.30	0.78	4.72	7.00
Cameroon	1.15	6.00	10.03	1.17	5.92	10.00
Central African Republic	0.27	1.37	2.28	0.27	1.31	2.21
Chad	0.73	3.19	5.79	0.73	3.11	5.73
Comoros	0.04	0.22	0.37	0.05	0.22	0.38
Congo, Democratic Republic	4.40	18.51	34.06	4.42	18.05	33.70
Côte d'Ivoire	1.22	5.81	9.89	1.23	6.15	10.26
Djibouti	0.05	0.29	0.45	0.05	0.29	0.45
Eritrea	0.31	1.63	2.75	0.31	1.53	2.67
Ethiopia	5.50	25.38	42.56	5.54	24.78	42.17
Ghana	1.37	7.58	12.26	1.44	7.79	12.70
Guinea	0.61	2.91	5.06	0.63	2.94	5.17
Guinea-Bissau	0.09	0.46	0.78	0.09	0.45	0.77
Guyana	0.05	0.26	0.38	0.05	0.25	0.38
Haiti	0.58	3.33	5.10	0.59	3.19	5.02
India	58.63	420.79	600.48	64.03	445.23	641.01
Kenya	2.47	12.05	20.83	2.49	11.90	20.78
Korea, Democratic Republic	0.97	9.77	12.45	1.03	9.18	12.00
Kyrgyzstan	0.25	1.94	2.73	0.26	1.83	2.66
Lao PDR	0.36	2.11	3.15	0.38	2.06	3.14
Lesotho	0.13	0.71	1.11	0.14	0.67	1.08
Liberia	0.25	1.17	2.05	0.25	1.16	2.08
Madagascar	1.36	6.16	10.69	1.36	6.04	10.63
Malawi	0.97	4.19	7.68	0.99	4.14	7.70
Mali	1.00	4.26	7.92	1.04	4.10	7.92
Mauritania	0.21	1.07	1.76	0.21	1.06	1.78
Mozambique	1.51	7.04	12.27	1.51	6.38	11.66
Myanmar	2.12	18.48	24.52	2.16	17.66	23.82
Nepal	1.78	10.10	15.36	1.88	9.57	15.12
Nicaragua	0.32	1.99	2.97	0.33	1.89	2.90
Niger	1.03	4.15	7.98	1.08	4.05	8.09
Nigeria	9.53	46.17	80.20	9.94	46.69	82.27
Pakistan	9.93	56.67	86.94	10.34	58.27	89.81
Papua New Guinea	0.41	2.13	3.44	0.43	2.17	3.58

(Continued)

Annex 2 - Continued

	Female			Male		
	10-14 years	**15+ years**	**Total**	**10-14 years**	**15+ years**	**Total**
Rwanda	0.64	3.22	5.57	0.64	3.04	5.37
Sao Tome and Principe	0.01	0.05	0.09	0.01	0.05	0.08
Senegal	0.79	3.69	6.44	0.81	3.52	6.33
Sierra Leone	0.38	1.77	3.07	0.36	1.66	2.93
Solomon Islands	0.03	0.16	0.27	0.03	0.17	0.29
Somalia	0.59	2.68	4.82	0.59	2.58	4.74
Sudan	2.63	13.43	22.15	2.72	13.43	22.49
Tajikistan	0.41	2.30	3.55	0.43	2.13	3.43
Tanzania	2.80	12.85	23.12	2.83	12.66	23.09
The Gambia	0.11	0.51	0.90	0.11	0.49	0.88
Togo	0.37	1.90	3.11	0.37	1.84	3.05
Uganda	2.27	8.97	17.26	2.27	8.85	17.25
Uzbekistan	1.33	10.02	13.96	1.37	9.71	13.80
Vietnam	3.23	34.82	44.89	3.39	33.36	43.91
Yemen	1.55	6.97	12.32	1.61	6.92	12.48
Zambia	0.86	3.60	6.72	0.87	3.60	6.75
Zimbabwe	0.79	4.03	6.46	0.79	3.85	6.29
GAVI-graduating countries (16 countries)	**15.86**	**146.47**	**195.91**	**16.45**	**139.06**	**190.48**
Angola	1.29	5.38	9.90	1.30	5.17	9.72
Armenia	0.09	1.37	1.66	0.10	1.11	1.44
Azerbaijan	0.25	3.79	4.70	0.28	3.55	4.61
Bhutan	0.03	0.24	0.35	0.04	0.28	0.39
Bolivia	0.56	3.29	5.05	0.58	3.20	5.03
Congo, Republic of	0.24	1.23	2.07	0.25	1.23	2.07
Cuba	0.34	4.67	5.59	0.36	4.68	5.66
Georgia	0.11	1.95	2.29	0.12	1.66	2.04
Honduras	0.44	2.50	3.88	0.46	2.44	3.88
Indonesia	10.45	89.80	121.51	10.83	87.88	120.82
Kiribati	-	-	-	-	-	-
Mongolia	0.12	1.03	1.42	0.12	0.99	1.38
Republic of Moldova	0.09	1.57	1.86	0.10	1.38	1.68
Sri Lanka	0.77	8.09	10.66	0.80	7.72	10.38
Timor-Leste	0.08	0.31	0.57	0.08	0.32	0.59
Ukraine	0.98	21.24	24.40	1.04	17.45	20.79

Population in millions.
GAVI-eligible countries: GNI per capita <= 1,500U$; GAVI-graduating countries: GNI per capita > 1,500U$ but they have a final opportunity in 2011 to apply for GAVI support.
Data sources: World population prospects 2011.

Annex 3. Methodology

Cervical cancer and head and neck cancers

Statistics are based on Globocan 2008 estimations, using the most recently available data produced by IARC.

Globocan 2008 incidence and mortality rates are estimated with a set of methods according to the availability and quality of data at the country or regional level. Therefore, it should be emphasized that estimates presented in Globocan 2008 are variable in accuracy, depending on the extent and the validity of available data by country, ranging from real and valid counts of cases and deaths, to estimates based on samples, to those based on neighbouring rates.

Incidence data are derived from population-based cancer registries and vital registration data; which may cover entire national populations or, more often, smaller areas. In the majority of less developed regions, such as GAVI countries, information is usually limited or completely lacking but it is the only source of information available. Mortality data are collected annually by WHO but, again, information is variable in quality and extent.

Cervical cancer statistics on survival are based on Cancer Survival in Africa, Asia, the Caribbean region and Central America (SurvCan), using the most recently available data produced by IARC. Survival data are derived from population-based cancer registries. Population-based survival represents the average prognosis of a cancer and is useful for assessing progress in cancer control, including the effect of early detection, diagnosis, treatment, and follow-up on cancer outcomes.

Anogenital cancers other than cervix

Statistics are based in CI5 volume IX, using the most recently available data produced by IARC.

Incidence data are derived from population-based cancer registries and vital registration data; which may cover entire national populations or, more often, smaller areas. In the majority of less developed regions, such as GAVI countries, information is of limited quality but it is the only source of information available. Mortality data are collected annually by WHO but not all datasets are of the same quality. Most African and Asian countries are not covered by cancer registration, and there are no data available. Even less information is available when considering data of good quality according to the CI5 (with data through 2002). The last volume of CI5 (volume IX) only covered 60 countries and 11% of the world population (1% of Africa; 4% of South and Central America; and 4% of Asia). Only 4 GAVI countries (Uganda, Zimbabwe, India and Pakistan) have registries included in CI5 volume IX and eight more (The Gambia, Mali, Mozambique, Nigeria, Senegal, Cuba, Kyrgyzstan and Vietnam) have registries included in previous volumes.

In the volume of Cancer in Africa (produced by IARC in 2003), it is possible to find information about cervical cancer from some other registries in Africa (Sudan, Burkina Faso, Cote d'Ivoire, The Gambia, Ghana, Guinea, Mali, Niger, Nigeria, Senegal, Angola, Cameroon, Congo, Congo DR, Gabon, Ethiopia, Kenya, Madagascar, Malawi, Rwanda, Mozambique, Tanzania, Uganda, Zimbabwe and Lesotho).

Other indicators

Indicators presented in this report include relevant statistics on HPV-related cancer sites, epidemiological determinants of cervical cancer, such as demographics factors and other risk factors, estimates on the burden of HPV infection, data on immunization and cervical cancer screening.

Aggregated information is derived from data and official reports produced by WHO, IARC, United Nations, The World Bank, and published literature.

The relevant methodological aspects of how indicators were generated are described in the WHO/ICO Information Centre on HPV and Cancer Indicators guideline, available at:
http://apps.who.int/hpvcentre/statistics/dynamic/ico/methodologies.pdf

Annex 4. Incidence of cervical cancer in the World, Less and More developed regions and GAVI countries

	N cases	Crude rate	ASR	Cum risk* by age 75	Ranking† All women	Ranking† Women 15-44y
World	530,232	15.8	15.3	1.6	3rd	2nd
Less developed regions	453,531	16.7	17.8	1.9	2nd	2nd
More developed regions	76,701	12.1	9.1	0.9	10th	3rd
GAVI-eligible countries (56 countries)	**254,374**	**20.0**	**25.9**	**2.8**	**1st**	**2nd**
Afghanistan	468	3.6	6.6	0.7	4th	3rd
Bangladesh	17,686	22.4	29.8	3.3	2nd	2nd
Benin	925	21.5	35.0	3.9	1st	2nd
Burkina Faso	1,230	16.1	28.6	3.1	1st	1st
Burundi	1,270	30.8	49.1	5.4	1st	1st
Cambodia	1,578	21.2	27.4	3.0	1st	1st
Cameroon	1,474	15.4	24.0	2.5	2nd	2nd
Central African Republic	284	12.9	19.4	2.1	2nd	2nd
Chad	615	11.2	19.9	2.2	2nd	2nd
Comoros	110	33.4	51.7	5.7	1st	1st
Congo, Democratic Republic of	3,839	11.8	21.3	2.2	1st	3rd
Cote d'Ivoire	1,601	15.9	26.9	3.4	1st	2nd
Djibouti	36	8.5	12.7	1.5	2nd	3rd
Eritrea	180	7.2	12.9	1.5	2nd	2nd
Ethiopia	4,648	11.5	18.8	2.1	2nd	2nd
Ghana	3,038	26.4	39.5	4.4	1st	1st
Guinea	1,736	35.7	56.3	6.2	1st	1st
Guinea-Bissau	185	23.3	35.1	3.8	1st	1st
Guyana	161	43.3	44.7	4.7	1st	1st
Haiti	568	11.4	16.0	1.6	2nd	2nd
India	134,420	23.5	27.0	2.8	1st	1st
Kenya	2,454	12.7	23.4	2.7	2nd	2nd
Korea, Democratic Republic of	942	7.8	6.6	0.6	6th	2nd
Kyrgyzstan	673	24.5	26.5	2.8	2nd	1st
Lao PDR	491	15.8	22.1	2.3	1st	1st
Lesotho	279	25.8	35.0	3.6	1st	2nd
Liberia	487	25.5	41.8	4.8	1st	1st
Madagascar	1,553	16.2	27.2	3.1	2nd	1st
Malawi	2,316	31.0	50.8	5.3	1st	2nd
Mali	1,491	23.2	37.7	4.0	1st	1st
Mauritania	364	23.0	35.1	3.9	1st	1st
Mozambique	3,690	32.1	50.6	5.5	1st	1st
Myanmar	6,434	25.4	26.4	2.8	2nd	2nd
Nepal	3,504	24.2	32.4	3.5	1st	1st
Nicaragua	869	30.4	39.9	4.1	1st	1st
Niger	572	7.8	15.6	1.8	2nd	2nd
Nigeria	14,550	19.3	33.0	3.7	2nd	2nd
Pakistan	11,688	13.6	19.5	2.1	2nd	2nd
Papua New Guinea	540	16.7	23.2	2.1	1st	1st

(Continued)

Annex 4 - Continued

	N cases	Crude rate	ASR	Cum risk* by age 75	Ranking† All women	Ranking† Women 15-44y
Rwanda	986	19.7	34.5	3.8	1st	1st
Sao Tome and Principe	-	-	-	-	-	-
Senegal	1,197	19.4	34.7	3.9	1st	1st
Sierra Leone	670	23.5	41.9	4.8	1st	1st
Solomon Islands	28	11.4	17.6	2.0	2nd	2nd
Somalia	541	12.0	20.3	2.3	2nd	2nd
Sudan	923	4.5	7.0	0.8	2nd	3rd
Tajikistan	217	6.3	8.7	0.9	4th	2nd
Tanzania	6,241	29.3	50.9	5.7	1st	1st
The Gambia	195	23.3	32.4	3.1	1st	1st
Togo	595	18.2	30.0	3.5	2nd	2nd
Uganda	3,577	22.6	47.5	5.2	1st	2nd
Uzbekistan	1,225	9.0	10.8	1.2	2nd	2nd
Vietnam	5,174	11.7	11.5	1.2	5th	1st
Yemen	162	1.4	3.0	0.4	13th	13th
Zambia	1,839	29.1	52.8	6.1	1st	1st
Zimbabwe	1,855	28.8	47.4	5.3	1st	2nd
GAVI-graduating countries (16 countries)	**28,337**	**15.2**	**14.5**	**1.5**	**3rd**	**2nd**
Angola	1,504	16.5	30.0	3.4	1st	1st
Armenia	385	23.4	17.3	2.0	3rd	2nd
Azerbaijan	463	10.4	10.0	1.1	3rd	3rd
Bhutan	50	15.4	20.4	2.1	1st	1st
Bolivia	1,422	29.3	36.4	3.7	1st	1st
Congo, Republic of	304	16.8	27.2	3.0	2nd	2nd
Cuba	1,603	28.7	23.1	2.2	4th	1st
Georgia	317	13.9	9.4	1.0	4th	3rd
Honduras	1,014	27.7	37.8	3.8	1st	1st
Indonesia	13,762	12.1	12.7	1.4	3rd	2nd
Kiribati	-	-	-	-	-	-
Mongolia	335	25.1	28.4	2.8	2nd	1st
Republic of Moldova	423	22.2	17.1	1.6	3rd	1st
Sri Lanka	1,395	13.7	11.8	1.4	2nd	4th
Timor-Leste	37	6.9	11.4	1.3	2nd	2nd
Ukraine	5,323	21.5	16.1	1.5	4th	2nd

*ASR: Age-standardized rate; Cum. risk: Cumulative risk.
Rates per 100,000 women per year. Standardized rates have been estimated using the direct method and the World population as the reference.
†Ranking of cervical cancer incidence to other cancers among all women and women aged 15-44 years according to highest incidence rates (ranking 1st). Ranking is based on crude incidence rates (actual number of cervical cancer cases) in the country/region. Ranking using ASR may differ.
GAVI-eligible countries: GNI per capita <= 1,500U$; GAVI-graduating countries: GNI per capita > 1,500U$ but they have a final opportunity in 2011 to apply for GAVI support.
Data sources: IARC, Globocan 2008.

Annex 5. Mortality of cervical cancer in the World, Less and More developed regions and GAVI countries

	N cases	Crude rate	ASR	Cum risk* by age 75	Ranking† All women	Ranking† Women 15-44y
World	275,008	8.2	7.8	0.9	5th	2nd
Less developed regions	242,077	8.9	9.8	1.1	2nd	2nd
More developed regions	32,931	5.2	3.1	0.3	11th	2nd
GAVI-eligible countries (56 countries)	**148,803**	**11.7**	**15.9**	**1.8**	**1st**	**1st**
Afghanistan	319	2.4	4.9	0.5	6th	6th
Bangladesh	10,364	13.1	17.9	2.1	1st	2nd
Benin	616	14.3	24.4	2.9	1st	2nd
Burkina Faso	838	11.0	21.5	2.6	1st	1st
Burundi	900	21.8	37.2	4.5	1st	1st
Cambodia	867	11.6	16.2	1.8	1st	1st
Cameroon	995	10.4	17.0	1.9	2nd	2nd
Central African Republic	201	9.1	14.1	1.6	2nd	2nd
Chad	425	7.7	14.6	1.7	2nd	2nd
Comoros	76	23.1	39.1	4.6	1st	1st
Congo, Democratic Republic of	2,760	8.5	16.4	1.8	1st	3rd
Cote d'Ivoire	1,095	10.8	19.1	2.6	1st	3rd
Djibouti	23	5.4	8.8	1.1	2nd	3rd
Eritrea	126	5.0	9.8	1.2	2nd	2nd
Ethiopia	3,235	8.0	14.0	1.7	1st	2nd
Ghana	2,006	17.4	27.6	3.3	1st	1st
Guinea	1,217	25.0	41.7	5.0	1st	1st
Guinea-Bissau	130	16.4	26.0	3.1	1st	1st
Guyana	74	19.9	20.5	2.2	1st	1st
Haiti	353	7.1	10.1	0.8	2nd	2nd
India	72,825	12.8	15.2	1.7	1st	1st
Kenya	1,676	8.6	17.3	2.1	1st	2nd
Korea, Democratic Republic of	518	4.3	3.3	0.3	7th	2nd
Kyrgyzstan	338	12.3	13.4	1.4	2nd	1st
Lao PDR	270	8.7	13.3	1.5	2nd	1st
Lesotho	178	16.4	22.7	2.5	1st	2nd
Liberia	341	17.9	31.2	3.9	1st	1st
Madagascar	1,085	11.3	20.5	2.5	1st	1st
Malawi	1,621	21.7	38.3	4.3	1st	2nd
Mali	1,010	15.7	28.4	3.3	1st	1st
Mauritania	244	15.4	25.5	3.1	1st	1st
Mozambique	2,356	20.5	34.5	4.0	1st	2nd
Myanmar	3,536	14.0	15.0	1.7	1st	1st
Nepal	1,872	12.9	17.6	2.0	1st	1st
Nicaragua	414	14.5	20.6	2.3	1st	1st
Niger	405	5.5	12.0	1.5	2nd	2nd
Nigeria	9,659	12.8	22.9	2.7	2nd	2nd
Pakistan	7,311	8.5	12.9	1.5	2nd	2nd
Papua New Guinea	364	11.3	17.6	1.6	1st	1st

(Continued)

Annex 5 - Continued

	N cases	Crude rate	ASR	Cum risk* by age 75	Ranking† All women	Ranking† Women 15-44y
Rwanda	678	13.5	25.4	2.9	1st	1st
Sao Tome and Principe	-	-	-	-	-	-
Senegal	795	12.9	25.5	3.1	1st	1st
Sierra Leone	466	16.3	33.0	4.2	1st	1st
Solomon Islands	16	6.5	10.9	1.3	1st	1st
Somalia	372	8.3	15.2	1.8	1st	2nd
Sudan	613	3.0	4.9	0.6	2nd	7th
Tajikistan	105	3.0	4.3	0.5	4th	2nd
Tanzania	4,355	20.4	37.5	4.5	1st	1st
The Gambia	133	15.9	24.4	2.5	1st	1st
Togo	417	12.8	21.8	2.8	1st	2nd
Uganda	2,464	15.6	34.9	4.2	1st	2nd
Uzbekistan	613	4.5	5.5	0.6	3rd	2nd
Vietnam	2,472	5.6	5.7	0.7	4th	5th
Yemen	99	0.9	2.0	0.3	13th	12th
Zambia	1,276	20.2	38.6	4.9	1st	2nd
Zimbabwe	1,286	20.0	33.4	3.9	1st	2nd
GAVI-graduating countries (16 countries)	**14,530**	**7.8**	**7.4**	**0.8**	**4th**	**2nd**
Angola	1,008	11.0	21.9	2.7	1st	1st
Armenia	202	12.3	8.7	1.0	6th	2nd
Azerbaijan	234	5.2	5.1	0.6	6th	3rd
Bhutan	27	8.3	10.9	1.2	2nd	1st
Bolivia	638	13.1	16.7	1.7	1st	1st
Congo, Republic of	191	10.5	17.6	2.0	1st	3rd
Cuba	684	12.2	8.9	0.9	4th	1st
Georgia	169	7.4	4.7	0.5	6th	3rd
Honduras	490	13.4	19.7	2.1	1st	1st
Indonesia	7,493	6.6	7.0	0.8	4th	2nd
Kiribati	-	-	-	-	-	-
Mongolia	106	7.9	10.3	1.2	4th	3rd
Republic of Moldova	194	10.2	7.4	0.8	4th	1st
Sri Lanka	814	8.0	6.9	0.8	3rd	4th
Timor-Leste	22	4.1	7.4	0.9	3rd	9th
Ukraine	2,258	9.1	5.9	0.6	6th	2nd

*ASR: Age-standardized rate; Cum. risk: Cumulative risk.
Rates per 100,000 women per year. Standardized rates have been estimated using the direct method and the World population as the reference.
†Ranking of cervical cancer mortality to other cancers among all women and women aged 15-44 years according to highest mortality rates (ranking 1st). Ranking is based on crude mortality rates (actual number of cervical cancer deaths) in the country/region. Ranking using ASR may differ.
GAVI-eligible countries: GNI per capita <= 1,500U$; GAVI-graduating countries: GNI per capita > 1,500U$ but they have a final opportunity in 2011 to apply for GAVI support. Data sources: IARC, Globocan 2008

Annex 6. Incidence of cancer of the Pharynx (excluding nasopharynx) in the World, Less and More developed regions and GAVI countries

Area	Male				Female			
	N cases	Crude rate	ASR	Cum risk* by age 75	N cases	Crude rate	ASR	Cum risk* by age 75
World	108,588	3.2	3.4	0.4	28,034	0.8	0.8	0.1
Less developed regions	68,523	2.4	3.0	0.4	19,593	0.7	0.8	0.1
More developed regions	40,065	6.7	4.5	0.5	8,441	1.3	0.8	0.1
GAVI-eligible countries (56 countries)	**48,266**	**3.7**	**5.8**	**0.7**	**12,838**	**1.0**	**1.4**	**0.2**
Afghanistan	50	0.4	0.8	0.1	28	0.2	0.5	0.1
Bangladesh	3,392	4.2	6.5	0.8	1,426	1.8	2.7	0.3
Benin	15	0.3	0.6	0.1	7	0.2	0.3	0.0
Burkina Faso	30	0.4	1.3	0.2	10	0.1	0.2	0.0
Burundi	39	1.0	2.3	0.3	21	0.5	0.9	0.1
Cambodia	139	2.0	3.7	0.4	58	0.8	1.1	0.2
Cameroon	120	1.3	2.0	0.2	17	0.2	0.3	0.1
Central African Republic	12	0.6	0.9	0.1	8	0.4	0.6	0.1
Chad	32	0.6	1.1	0.1	18	0.3	0.6	0.1
Comoros	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Congo, Democratic Republic of	58	0.2	0.3	0.0	15	0.0	0.1	0.0
Cote d'Ivoire	38	0.4	0.5	0.1	13	0.1	0.2	0.0
Djibouti	0	0.0	0.0	0.0	2	0.5	0.6	0.1
Eritrea	10	0.4	1.0	0.1	13	0.5	1.0	0.1
Ethiopia	251	0.6	1.2	0.2	155	0.4	0.6	0.1
Ghana	55	0.5	0.8	0.1	23	0.2	0.3	0.0
Guinea	19	0.4	0.6	0.1	12	0.2	0.4	0.0
Guinea-Bissau	1	0.1	0.2	0.0	0	0.0	0.0	0.0
Guyana	9	2.3	2.6	0.4	1	0.3	0.2	0.0
Haiti	73	1.5	2.6	0.5	5	0.1	0.1	0.0
India	36,731	6.0	8.3	1.0	8,540	1.5	1.8	0.2
Kenya	141	0.7	1.9	0.3	11	0.1	0.1	0.0
Korea, Democratic Republic of	80	0.7	0.7	0.1	33	0.3	0.2	0.0
Kyrgyzstan	46	1.7	2.5	0.3	18	0.7	0.8	0.1
Lao PDR	31	1.0	1.9	0.2	12	0.4	0.6	0.1
Lesotho	9	0.9	1.8	0.2	0	0.0	0.0	0.0
Liberia	6	0.3	0.6	0.1	2	0.1	0.2	0.0
Madagascar	367	3.9	7.3	0.8	63	0.7	1.1	0.1
Malawi	7	0.1	0.2	0.0	0	0.0	0.0	0.0
Mali	7	0.1	0.3	0.1	8	0.1	0.2	0.0
Mauritania	3	0.2	0.4	0.1	0	0.0	0.0	0.0
Mozambique	58	0.5	1.2	0.1	15	0.1	0.2	0.0
Myanmar	792	3.3	4.0	0.4	197	0.8	0.9	0.1
Nepal	455	3.2	5.5	0.7	168	1.2	1.7	0.2
Nicaragua	35	1.2	2.1	0.3	13	0.5	0.8	0.1
Niger	30	0.4	0.8	0.1	10	0.1	0.2	0.0
Nigeria	225	0.3	0.4	0.0	120	0.2	0.3	0.1
Pakistan	3,631	4.0	6.4	0.8	1,029	1.2	1.8	0.2
Papua New Guinea	80	2.4	6.3	1.3	8	0.2	0.3	0.0
Rwanda	23	0.5	1.0	0.1	23	0.5	0.9	0.1
Sao Tome and Principe	-	-	-	-	-	-	-	-
Senegal	13	0.2	0.4	0.1	7	0.1	0.2	0.0

(Continued)

Annex 6 - Continued

Area	Male				Female			
	N cases	Crude rate	ASR	Cum risk* by age 75	N cases	Crude rate	ASR	Cum risk* by age 75
Sierra Leone	8	0.3	0.5	0.1	4	0.1	0.2	0.0
Solomon Islands	1	0.4	0.9	0.2	0	0.0	0.0	0.0
Somalia	26	0.6	1.3	0.2	12	0.3	0.5	0.1
Sudan	103	0.5	0.8	0.1	201	1.0	1.5	0.2
Tajikistan	25	0.7	1.3	0.1	18	0.5	0.8	0.1
Tanzania	210	1.0	2.3	0.3	63	0.3	0.5	0.1
The Gambia	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Togo	10	0.3	0.5	0.1	4	0.1	0.2	0.0
Uganda	136	0.9	2.2	0.3	77	0.5	1.1	0.2
Uzbekistan	146	1.1	1.6	0.2	94	0.7	0.9	0.1
Vietnam	389	0.9	1.1	0.1	198	0.4	0.4	0.1
Yemen	38	0.3	0.8	0.1	47	0.4	0.8	0.1
Zambia	36	0.6	1.4	0.2	7	0.1	0.2	0.0
Zimbabwe	25	0.4	1.0	0.1	4	0.1	0.1	0.0
GAVI-graduating countries (16 countries)	**4,391**	**2.4**	**2.7**	**0.3**	**1,138**	**0.6**	**0.6**	**0.1**
Angola	64	0.7	1.8	0.2	16	0.2	0.4	0.0
Armenia	29	2.0	1.9	0.3	6	0.4	0.3	0.0
Azerbaijan	41	1.0	1.2	0.2	35	0.8	0.8	0.1
Bhutan	14	3.9	5.7	0.6	10	3.1	3.8	0.4
Bolivia	13	0.3	0.4	0.1	11	0.2	0.3	0.1
Congo, Republic of	3	0.2	0.3	0.0	2	0.1	0.2	0.0
Cuba	270	4.8	3.5	0.4	56	1.0	0.7	0.1
Georgia	29	1.4	1.0	0.1	6	0.3	0.1	0.0
Honduras	78	2.1	3.6	0.4	38	1.0	1.7	0.2
Indonesia	1,317	1.2	1.5	0.2	619	0.5	0.6	0.1
Kiribati	-	-	-	-	-	-	-	-
Mongolia	10	0.8	1.0	0.1	6	0.4	0.6	0.1
Republic of Moldova	183	10.6	8.4	1.1	9	0.5	0.4	0.0
Sri Lanka	674	6.8	6.5	0.8	156	1.5	1.3	0.1
Timor-Leste	4	0.7	1.9	0.2	0	0.0	0.0	0.0
Ukraine	1,662	7.8	5.7	0.7	168	0.7	0.4	0.0

* ASR: Age-standardized rate; Cum. risk: Cumulative risk.
GAVI-eligible countries: GNI per capita <= 1,500U$; GAVI-graduating countries: GNI per capita > 1,500U$ but they have a final opportunity in 2011 to apply for GAVI support.
Rates per 100,000 men/women per year. Standardized rates have been estimated using the direct method and the World population as the reference.
Data sources: IARC, Globocan 2008.

Annex 7. Mortality of cancer of the Pharynx (excluding nasopharynx) in the World, Less and More developed regions and GAVI countries

Area	Male				Female			
	N cases	Crude rate	ASR	Cum risk* by age 75	N cases	Crude rate	ASR	Cum risk* by age 75
World	76,458	2.2	2.4	0.3	19,092	0.6	0.5	0.1
Less developed regions	55,852	2.0	2.5	0.3	15,205	0.6	0.6	0.1
More developed regions	20,606	3.4	2.2	0.3	3,887	0.6	0.3	0.0
GAVI-Eligible countries (56 countries)	**42,019**	**3.2**	**5.0**	**0.6**	**10,485**	**0.8**	**1.1**	**0.1**
Afghanistan	43	0.3	0.7	0.1	23	0.2	0.4	0.0
Bangladesh	2,941	3.6	5.7	0.7	1,218	1.5	2.3	0.2
Benin	14	0.3	0.5	0.1	6	0.1	0.2	0.0
Burkina Faso	27	0.4	1.2	0.2	9	0.1	0.1	0.0
Burundi	34	0.9	2.1	0.2	20	0.5	0.8	0.1
Cambodia	102	1.4	3.0	0.3	43	0.6	0.9	0.1
Cameroon	104	1.1	1.8	0.2	16	0.2	0.3	0.0
Central African Republic	11	0.5	0.8	0.1	8	0.4	0.6	0.1
Chad	29	0.5	1.0	0.1	17	0.3	0.6	0.1
Comoros	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Congo, Democratic Republic of	49	0.2	0.3	0.0	12	0.0	0.1	0.0
Cote d'Ivoire	34	0.3	0.5	0.1	11	0.1	0.1	0.0
Djibouti	0	0.0	0.0	0.0	2	0.5	0.6	0.1
Eritrea	10	0.4	1.0	0.1	12	0.5	0.9	0.1
Ethiopia	215	0.5	1.0	0.1	132	0.3	0.6	0.1
Ghana	48	0.4	0.7	0.1	19	0.2	0.2	0.0
Guinea	17	0.3	0.5	0.1	10	0.2	0.3	0.0
Guinea-Bissau	1	0.1	0.2	0.0	0	0.0	0.0	0.0
Guyana	7	1.8	2.1	0.3	1	0.3	0.2	0.0
Haiti	44	0.9	1.6	0.3	2	0.0	0.0	0.0
India	32,446	5.3	7.2	0.8	6,900	1.2	1.5	0.2
Kenya	121	0.6	1.7	0.3	9	0.0	0.0	0.0
Korea, Democratic Republic of	61	0.5	0.5	0.1	25	0.2	0.2	0.0
Kyrgyzstan	37	1.4	2.0	0.2	15	0.5	0.7	0.1
Lao PDR	21	0.7	1.3	0.1	8	0.3	0.4	0.0
Lesotho	9	0.9	1.8	0.2	0	0.0	0.0	0.0
Liberia	6	0.3	0.6	0.1	2	0.1	0.2	0.0
Madagascar	315	3.3	6.4	0.7	54	0.6	0.9	0.1
Malawi	6	0.1	0.2	0.0	0	0.0	0.0	0.0
Mali	6	0.1	0.3	0.0	7	0.1	0.2	0.0
Mauritania	3	0.2	0.4	0.1	0	0.0	0.0	0.0
Mozambique	49	0.5	1.0	0.1	14	0.1	0.2	0.0
Myanmar	586	2.4	2.9	0.3	144	0.6	0.6	0.1
Nepal	380	2.7	4.7	0.6	140	1.0	1.4	0.2
Nicaragua	21	0.7	1.2	0.1	8	0.3	0.4	0.1
Niger	26	0.4	0.7	0.1	8	0.1	0.2	0.0
Nigeria	191	0.3	0.4	0.0	101	0.1	0.2	0.1
Pakistan	2,971	3.3	5.3	0.7	856	1.0	1.5	0.2
Papua New Guinea	70	2.1	5.7	1.1	8	0.2	0.3	0.0
Rwanda	21	0.4	0.9	0.1	20	0.4	0.8	0.1
Sao Tome and Principe	-	-	-	-	-	-	-	-
Senegal	12	0.2	0.4	0.1	7	0.1	0.2	0.0

(Continued)

Annex 7 - Continued

Area	Male				Female			
	N cases	Crude rate	ASR	Cum risk* by age 75	N cases	Crude rate	ASR	Cum risk* by age 75
Sierra Leone	8	0.3	0.5	0.1	4	0.1	0.2	0.0
Solomon Islands	1	0.4	0.9	0.2	0	0.0	0.0	0.0
Somalia	22	0.5	1.1	0.2	11	0.2	0.4	0.1
Sudan	87	0.4	0.7	0.1	171	0.8	1.3	0.2
Tajikistan	21	0.6	1.1	0.1	16	0.5	0.7	0.1
Tanzania	180	0.9	2.0	0.2	54	0.3	0.5	0.1
The Gambia	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Togo	9	0.3	0.5	0.1	4	0.1	0.2	0.0
Uganda	117	0.7	2.0	0.2	66	0.4	1.0	0.2
Uzbekistan	119	0.9	1.4	0.2	82	0.6	0.8	0.1
Vietnam	282	0.7	0.8	0.1	143	0.3	0.3	0.0
Yemen	31	0.3	0.7	0.1	37	0.3	0.7	0.1
Zambia	31	0.5	1.2	0.2	6	0.1	0.2	0.0
Zimbabwe	23	0.4	0.9	0.1	4	0.1	0.1	0.0
GAVI-graduating countries (16 countries)	**3,277**	**1.8**	**2.0**	**0.2**	**862**	**0.5**	**0.4**	**0.1**
Angola	54	0.6	1.6	0.2	13	0.1	0.3	0.0
Armenia	24	1.7	1.5	0.2	6	0.4	0.3	0.0
Azerbaijan	41	1.0	1.2	0.1	29	0.6	0.7	0.1
Bhutan	13	3.6	5.3	0.6	10	3.1	3.8	0.4
Bolivia	11	0.2	0.4	0.1	9	0.2	0.3	0.0
Congo, Republic of	3	0.2	0.3	0.0	2	0.1	0.2	0.0
Cuba	176	3.1	2.2	0.3	36	0.6	0.4	0.1
Georgia	26	1.3	0.8	0.1	6	0.3	0.1	0.0
Honduras	46	1.3	2.1	0.2	22	0.6	0.9	0.1
Indonesia	1,077	0.9	1.2	0.1	506	0.4	0.5	0.1
Kiribati	-	-	-	-	-	-	-	-
Mongolia	4	0.3	0.5	0.1	5	0.4	0.4	0.0
Republic of Moldova	133	7.7	6.0	0.8	4	0.2	0.2	0.0
Sri Lanka	582	5.9	5.7	0.7	133	1.3	1.1	0.1
Timor-Leste	4	0.7	1.9	0.2	0	0.0	0.0	0.0
Ukraine	1,083	5.1	3.7	0.5	81	0.3	0.2	0.0

* ASR: Age-standardized rate; Cum. risk: Cumulative risk.
GAVI-eligible countries: GNI per capita <= 1,500U$; GAVI-graduating countries: GNI per capita > 1,500U$ but they have a final opportunity in 2011 to apply for GAVI support.
Rates per 100,000 men/women per year. Standardized rates have been estimated using the direct method and the World population as the reference.
Data sources: IARC, Globocan 2008.

Annex 8. Terminology of cervical cancer lesions

Cervical cytologically normal women

No abnormal cells are observed on the surface of their cervix upon cytological assessment.

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 CIN1.

High-grade cervical lesions (HSIL/ CIN2 / CIN3 / 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, CIN2, CIN3, 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.

Annex 9. Prevalence of HPV among women with normal cervical cytology in the World, Less and More developed regions, sub-regions and GAVI countries

Region	Number of women tested	HPV prevalence	95% (CI)
World	436,430	11.4	11.3-11.5
Less developed regions	120,008	14.3	14.1-14.5
More developed regions	315,573	10.3	10.2-10.4
GAVI countries	31,758	11.5	11.2-11.9
Eastern Africa	751	33.6	30.2-37.1
Kenya	369	38.8	33.8-43.9
Mozambique	196	32.1	25.7-39.2
Zimbabwe	186	24.7	18.7-31.6
Middle Africa	-	-	-
Northern Africa	863	10.9	8.9-13.2
Southern Africa	2,485	21.0	19.4-22.6
Western Africa	4,469	21.5	20.3-22.8
Cote d'Ivoire	314	20.7	16.4-25.6
Guinea	752	47.9	44.2-51.5
Nigeria	1,030	23.7	21.1-26.4
Senegal	1,797	12.6	11.1-14.3
The Gambia	576	11.5	9.0-14.3
Caribbean	212	35.4	29.0-42.2
Central America	24,783	20.6	20.1-21.1
Honduras (*)	538	36.8	32.7-41.0
South America	17,500	13.2	12.7-13.7
Central Asia	-	-	-
Eastern Asia	55,365	12.6	12.3-12.9
Mongolia (*)	842	30.5	27.4-33.8
Southern Asia	23,061	7.9	7.5-8.2
India	23,061	7.9	7.5-8.2
South-Eastern Asia	4,849	8.4	7.6-9.2
Indonesia (*)	200	31.0	24.7-37.9
Vietnam	1,897	5.4	4.5-6.5
Western Asia	1,435	2.2	1.5-3.1
Eastern Europe	4,053	22.3	21.0-23.6
Melanesia	-	-	-

The samples for HPV testing come from cervical specimens (fresh / fixed biopsies or exfoliated cells).
95% CI: 95% Confidence Interval
(*) GAVI graduating country.
Data sources: Bruni et al. 2010.

Annex 10. Prevalence of HPV16/18 in women with normal cervical cytology, precancerous cervical lesions and invasive cervical cancer in the World, Less and More developed regions, sub-regions and GAVI countries

	Normal cytology		Low-grade lesions$^{\alpha}$		High-grade lesions$^{\beta}$		Cervical cancer	
	No. tested	HPV Prev % (95%CI)	No. tested	HPV Prev % (95%CI)	No. tested	HPV Prev % (95%CI)	No. tested	HPV Prev % (95%CI)
World	218,339	3.8 (3.7-3.9)	14,762	24.3 (23.6-25.0)	14,901	51.1 (50.3-51.9)	22,826	70.9 (70.3-71.5)
Less developed regions	55,381	4.6 (4.4-4.8)	3,048	25.7 (24.1-27.3)	3,801	46.8 (45.2-48.4)	12,500	71.0 (70.2-71.8)
More developed regions	162,958	3.6 (3.5-3.7)	11,754	24.0 (23.2-24.8)	11,100	52.4 (51.5-53.3)	10,326	70.8 (69.9-71.7)
GAVI countries	13,122	5.5 (5.1-5.9)	532	19.9 (16.6-23.6)	426	39.9 (35.2-44.7)	2,441	73.8 (72.0-75.6)
Eastern Africa	556	6.7 (4.7-9.1)	30	20.0 (7.7-38.6)	29	37.9 (20.7-57.7)	1,080	74.8 (72.1-77.4)
Ethiopia	-	- -	-	- -	-	- -	163	90.2 (85.6-94.8)
Kenya	369	5.7 (3.6-9.6)	30	20.0 (7.7-38.6)	29	37.9 (20.7-57.7)	261	60.9 (54.7-66.9)
Mozambique	187	8.5 (5.0-13.5)	-	- -	-	- -	302	79.1 (74.1-83.6)
Tanzania	-	- -	-	- -	-	- -	102	69.6 (59.7-78.3)
Uganda	-	- -	-	- -	-	- -	154	74.1 (66.4-80.8)
Zimbabwe	-	- -	-	- -	-	- -	98	79.6 (70.3-87.1)
Northern Africa	707	4.3 (2.9-6.0)	-	- -	-	- -	335	72.5 (67.4-77.2)
Southern Africa	1,216	3.6 (2.6-4.8)	15	26.6 (7.8-55.1)	168	58.4 (50.5-65.9)	307	62.8 (57.2-68.3)
Western Africa	3,393	4.6 (3.9-5.4)	313	22.3 (17.9-27.4)	138	41.3 (33.0-50.0)	218	50.0 (43.2-56.8)
Benin	-	- -	-	- -	-	- -	6	66.7 (22.3-95.7)
Cote d'Ivoire	-	- -	151	16.6 (11.0-23.5)	49	40.8 (27.0-55.8)	-	- -
Guinea	752	9.8 (7.8-12.2)	-	- -	-	- -	18	44.5 (21.5-69.2)
Mali	-	- -	-	- -	-	- -	123	53.7 (44.4-62.7)
Nigeria	844	4.7 (3.4-6.4)	34	8.8 (1.9-23.7)	-	- -	-	- -
Senegal	1,797	2.3 (1.6-3.1)	128	32.9 (24.8-41.7)	89	41.5 (31.2-52.5)	71	43.6 (31.9-56.0)
Caribbean	212	3.3 (1.3-6.7)	263	8.7 (5.6-12.8)	294	33.6 (28.3-39.4)	59	61.1 (47.4-73.5)
Cuba (*)	-	- -	15	6.7 (0.2-31.9)	45	37.8 (23.8-53.5)	45	64.5 (48.8-78.1)
Central America	12,381	4.1 (3.8-4.5)	571	16.7 (13.7-20.0)	447	44.3 (39.6-49.0)	463	62.9 (58.3-67.3)
Honduras (*)	538	14.6 (11.8-18.0)	44	18.2 (8.2-32.7)	81	43.2 (32.2-54.7)	104	53.9 (43.8-63.7)
Nicaragua	-	- -	79	7.6 (2.8-15.8)	108	33.4 (24.6-43.1)	19	57.9 (33.5-79.7)
South America	5,854	5.2 (4.6-5.8)	570	34.3 (30.5-38.4)	572	55.3 (51.1-59.4)	1,520	67.7 (65.3-70.0)
Bolivia (*)	-	- -	-	- -	-	- -	47	38.3 (24.5-53.6)
Eastern Asia	39,292	3.2 (3.0-3.4)	1,576	26.9 (24.7-29.2)	2,408	45.6 (43.6-47.6)	7,870	66.3 (65.2-67.3)
Mongolia (*)	842	7.2 (5.6-9.2)	-	- -	-	- -	-	- -
Southern Asia	5,696	6.0 (5.4-6.7)	63	33.3 (22.0-46.3)	32	59.3 (40.6-76.3)	925	82.3 (79.7-84.7)
India	5,696	6.0 (5.4-6.7)	51	29.4 (17.5-43.8)	25	56.0 (34.9-75.6)	747	82.5 (79.5-85.1)
Pakistan	-	- -	-	- -	-	- -	60	96.7 (88.5-99.6)
South-Eastern Asia	4,849	3.2 (2.7-3.7)	212	14.2 (9.8-19.6)	207	33.3 (27.0-40.2)	1,273	72.6 (70.0-75.0)
Indonesia (*)	200	4.0 (1.7-7.7)	-	- -	-	- -	121	80.1 (71.9-86.9)
Vietnam	1,897	2.1 (1.5-2.9)	-	- -	-	- -	-	- -
Western Asia	91	2.2 (0.3-7.7)	-	- -	-	- -	-	- -
Eastern Europe	3,562	9.7 (8.8-10.7)	241	32.6 (26.9-39.1)	254	56.9 (50.8-63.3)	652	74.5 (71.0-77.8)

Information about HPV 16/18 prevalence is found in 17 GAVI countries for Invasive cervical cancer, 10 GAVI countries for Normal cytology, 7 GAVI countries for High-grade cervical lesions and 8 GAVI countries for Low-grade cervical lesions.
The samples for HPV testing come from cervical specimens (fresh / fixed biopsies or exfoliated cells).
95% CI: 95% Confidence Interval. (*) GAVI graduating country.
GAVI-eligible countries: GNI per capita <= 1,500U$; GAVI-graduating countries: GNI per capita > 1,500U$ but they have a final opportunity in 2011 to apply for GAVI support.
$^{\alpha}$ Low-grade lesions: LSIL or CIN-1
$^{\beta}$ High-grade lesions: CIN2, CIN3, CIS or HSIL
Data sources: Bruni et al. 2010; Clifford et al. 2005; Clifford et al. 2003;89; Smith et al. 2007; Clifford et al. 2003;88; Clifford et al. 2008.

Annex 11. Factors contributing to cervical cancer in GAVI countries

	Female Tobacco		Fertility		HIV 15 to 49 yrs		Oral Contraceptive Use*	
	Year	Prev (%)	Year	Number	Year	Prev (%)	Year	Prev (%)
GAVI-eligible (56 countries)								
Afghanistan	-	-	2001	6.8	-	-	2006	8.1
Bangladesh	2009	2.0	2005	2.7	2009	<0.1	2007	28.5
Benin	2009	1.0	2004	5.8	2009	1.2	2006	1.5
Burkina Faso	2009	8.0	2001	6.2	2009	1.2	2006	4.6
Burundi	-	-	2001	5.6	2009	3.3	2005/06	1.8
Cambodia	2009	3.0	2003	3.4	2009	0.5	2005	12.6
Cameroon	2009	2.0	2002	5.2	2009	5.3	2006	1.9
Central African Republic	-	-	2003	5.2	2009	4.7	2006	4.4
Chad	2009	3.0	2002	6.6	2009	3.4	2004	0.5
Comoros	2009	9.0	2003	5.3	2009	0.1	2000	8.3
Congo, Democratic Republic of	2009	2.0	2006	6.3	-	-	2007	1.0
Côte d'Ivoire	2009	4.0	2006	4.4	2009	3.4	2006	5.5
Djibouti	-	-	2000	4.2	2009	2.5	2006	13.6
Eritrea	2009	2.0	2000	5.2	2009	0.8	2002	1.4
Ethiopia	2009	0.4	2003	5.7	-	-	2005	3.1
Ghana	2009	3.0	2001	4.6	2009	1.8	2008	4.7
Guinea	2009	2.0	2003	5.6	2009	1.3	2005	1.6
Guinea Bissau	-	-	2000	7.7	2009	2.5	2006	1.3
Guyana	2009	6.0	2003	2.7	2009	1.2	2009	9.2
Haiti	-	-	2003	4.0	2009	1.9	2005/06	3.3
India	2009	4.0	2006	2.8	2009	0.3	2005/06	3.1
Kenya	2009	1.0	2001	5.0	2009	6.3	2008/09	7.2
Korea, Democratic Republic of	-	-	1994	2.2	-	-	2002	3.7
Kyrgyzstan	2009	2.0	2006	2.7	2009	0.3	2005/06	5.1
Lao PDR	2009	4.0	2005	4.6	2009	0.2	2000	12.9
Lesotho	-	-	2003	4.2	2009	23.5	2009	12.5
Liberia	-	-	2004	5.4	2009	1.5	2007	3.8
Madagascar	-	-	2001	5.4	2009	0.2	2008/09	6.0
Malawi	2009	4.0	2005	6.3	2009	11.0	2006	2.4
Mali	2009	2.0	2004	6.7	2009	1.0	2006	2.9
Mauritania	2009	4.0	2002	4.6	2009	0.7	2007	5.7
Mozambique	2009	2.0	2001	5.6	2009	11.5	2003/04	4.9
Myanmar	2009	8.0	1999	2.6	2009	0.6	2007	10.8
Nepal	2009	29.0	2004	3.3	2009	0.4	2006	3.5
Nicaragua	-	-	2005	2.7	2009	0.2	2006/07	13.5
Niger	2009	0.4	2004	7.1	2009	0.8	2006	3.0
Nigeria	2009	3.0	2002	5.7	2009	3.6	2008	1.7
Pakistan	2009	6.0	2005	3.8	2009	0.1	2007/08	1.9
Papua New Guinea	2009	31.0	1994	4.8	2009	0.9	2006	-
Rwanda	-	-	2006	5.5	2009	2.9	2007/08	6.4
Sao Tome and Principe	2009	2.0	2001	4.7	-	-	2008/09	15.1
Senegal	2009	0.4	2003	5.2	2009	0.9	2005	3.6

(Continued)

Annex 11 - Continued

	Female Tobacco		Fertility		HIV 15 to 49 yrs		Oral Contraceptive Use*	
	Year	Prev (%)	Year	Number	Year	Prev (%)	Year	Prev (%)
Sierra Leone	2009	8.0	2007	5.1	2009	1.6	2008	2.3
Solomon Islands	2009	19.0	1999	4.5	-	-	2006/07	1.3
Somalia	-	-	2005	6.7	2009	0.7	2005/06	0.8
Sudan	2009	2.0	1997	4.9	2009	1.1	2006	4.3
Tajikistan	-	-	2005	3.1	2009	0.2	2007	2.6
Tanzania	2009	3.0	2003	5.7	2009	5.6	2010	6.7
The Gambia	2009	3.0	2000	5.3	2009	2.0	2001	6.5
Togo	-	-	1996	5.4	2009	3.2	2006	2.0
Uganda	2009	3.0	2004	6.8	2009	6.5	2006	2.9
Uzbekistan	2009	3.0	2006	2.4	2009	0.1	2006	2.3
Vietnam	2009	2.0	2006	2.1	2009	0.4	2007	10.4
Yemen	2009	11.0	2005	5.2	-	-	2006	9.0
Zambia	2009	4.0	2006	6.2	2009	13.5	2007	11.0
Zimbabwe	2009	4.0	2003	3.9	2009	14.3	2005/06	43.0
GAVI-graduating (16 countries)								
Angola	-	-	2005	5.8	2009	2.0	2001	2.2
Armenia	2009	2.0	2006	1.4	2009	0.1	2005	0.8
Azerbaijan	-	-	2006	2.3	2009	0.1	2006	1.1
Bhutan	-	-	2005	2.5	2009	0.2	2000	3.4
Bolivia	2009	18.0	2006	3.6	2009	0.2	2008	3.3
Congo, Republic of	2009	0.4	2003	4.7	2009	3.4	2005	2.3
Cuba	-	-	2006	1.4	2009	0.1	2006	5.5
Georgia	2009	6.0	2006	1.4	2009	0.1	2005	3.2
Honduras	2009	3.0	2003	3.4	2009	0.8	2005/06	11.3
Indonesia	2009	5.0	2006	2.6	2009	0.2	2007	13.2
Kiribati	2009	43.0	2005	3.4	-	-	2000	6.5
Mongolia	2009	6.0	2006	2.0	2009	<0.1	2005	11.5
Republic of Moldova	2009	5.0	2006	1.3	2009	0.4	2005	3.6
Sri Lanka	2009	0.4	2005	2.4	2009	<0.1	2006/07	7.9
Timor-Leste	-	-	2004	7.0	-	-	2009/10	1.7
Ukraine	2009	13.0	2006	1.3	2009	1.1	2007	4.8

Prev: prevalence.
* Among women who are married or in union.
GAVI-eligible countries: GNI per capita <= 1,500U$; GAVI-graduating countries: GNI per capita > 1,500U$ but they have a final opportunity in 2011 to apply for GAVI support.
Data sources: WHO Tobacco 2011; United Nations Fertility 2009; UNAIDS/WHO, 2010; United Nations Contraceptive 2011.

Annex 12. Proportion of young women (15-24 years) who have sex before the age of 15 in GAVI countries

	Young women (15-44 yrs) who have sex before the age of 15 yrs	
	Year	Prev (%)
GAVI-eligible (56 countries)		
Afghanistan	-	-
Bangladesh	-	-
Benin	2006	12.0
Burkina Faso	2003	7.0
Burundi	-	-
Cambodia	2005	1.0
Cameroon	2004	17.1
Central African Republic	Unknown	30.3
Chad	2004	26.0
Comoros	Unknown	18.0
Congo, Democratic Republic of	-	-
Côte d'Ivoire	1998	23.0
Djibouti	-	-
Eritrea	-	-
Ethiopia	2005	16.0
Ghana	2003	7.0
Guinea	-	-
Guinea Bissau	-	-
Guyana	-	-
Haiti	1994	9.0
India	-	-
Kenya	2003	14.0
Korea, Democratic Republic of	-	-
Kyrgyzstan	-	-
Lao PDR	-	-
Lesotho	-	-
Liberia	2007	17.0
Madagascar	2003-2004	15.0
Malawi	2004	15.0
Mali	2006	25.0
Mauritania	-	-
Mozambique	2003	28.0
Myanmar	-	-
Nepal	2006	7.0
Nicaragua	2001	12.0
Niger	-	46.6
Nigeria	2003	21.0
Pakistan	-	-
Papua New Guinea	-	-
Rwanda	2005	4.0
Sao Tome and Principe	-	-
Senegal	2005	9.0
Sierra Leone	-	-
Solomon Islands	-	-
Somalia	-	-
Sudan	-	-

(Continued)

Annex 12 - Continued

	Young women (15-44 yrs) who have sex before the age of 15 yrs	
	Year	Prev (%)
Tajikistan	-	-
Tanzania	2004	12.0
The Gambia	-	-
Togo	1998	18.7
Uganda	2004-2005	14.0
Uzbekistan	-	-
Vietnam	Unknown	0.0
Yemen	-	-
Zambia	2001-2002	18.0
Zimbabwe	2005-2006	5.0
GAVI-graduating		
Angola	-	-
Armenia	2005	0.5
Azerbaijan	2006	1.0
Bhutan	-	-
Bolivia	2003	6.0
Congo, Republic of	2005	23.0
Cuba	-	-
Georgia	-	-
Honduras	-	-
Indonesia	-	-
Kiribati	-	-
Mongolia	-	-
Republic of Moldova	2005	1.0
Sri Lanka	-	-
Timor-Leste	-	-
Ukraine	-	-

GAVI-eligible countries: GNI per capita <= 1,500U$; GAVI-graduating countries: GNI per capita > 1,500U$ but they have a final opportunity in 2011 to apply for GAVI support.
Data sources:
Armenia Demographic and Health Survey 2005; Azerbaijan Demographic and Health Survey 2006; Benin Enquete Demographique et de Sante 2006: The HIV Test Data were not scrambled, and are therefore not available for analysis; Bolivia Encuesta Nacional de Demografia y Salud 2003; Burkina Faso Demographic and Health Survey 2003; Cambodia Demographic and Health Survey 2005; Cameroon Demographic and Health Survey 2004; Congo Enquete Demographique et de Sante 2005; Cote d'Ivoire Demographic and Health Survey 1998; Encuesta Nicaraguense de Demografia y Salud 2001; Enquete Demographique et de Sante 2003-2004, Madagascar; Ethiopia Demographic and Health Survey 2005; Ghana Demographic and Health Survey 2003; Haiti Demographic and Health Survey 1994; Kenya Demographic and Health Survey 2003; Liberia Demographic and Health Survey 2007; Malawi Demographic and Health Survey 2004; Mali Enquete Demographique et de Sante 2006, ENDSM-IV; Moldova Demographic and Health Survey 2005; Mozambique Demographic and Health Survey 2003; Nepal Demographic and Health Survey 2006; Nigeria Demographic and Health Survey 2003; Rwanda Demographic and Health Survey 2005; Senegal Demographic and Health Survey 2005; Tanzania Demographic and Health Survey 2004; Chad Enquete Demographique et de Sante 2004; Uganda HIV/AIDS Sero-Behavioural Survey 2004-05; Vietnam Population and AIDS Indicator Survey; Zambia Demographic and Health Survey 2001-2002; Zimbabwe Demographic and Health Survey 2005-06.

Annex 13. Prevalence of Male condom use in GAVI countries

	Male Condom Use	
	Year	Prevalence (%)
GAVI-eligible (56 countries)		
Afghanistan	2006	2.2
Bangladesh	2007	4.5
Benin	2006	1.1
Burkina Faso	2006	1.4
Burundi	2005/06	0.3
Cambodia	2005	2.9
Cameroon	2006	6.5
Central African Republic	2006	3.5
Chad	2004	0.4
Comoros	2000	0.7
Congo, Democratic Republic of	2007	3.4
Côte d'Ivoire	2006	1.0
Djibouti	2006	0.2
Eritrea	2002	0.6
Ethiopia	2005	0.2
Ghana	2008	2.4
Guinea	2005	1.1
Guinea Bissau	2006	0.7
Guyana	2009	12.9
Haiti	2005/06	5.3
India	2005/06	5.2
Kenya	2008/09	1.8
Korea, Democratic Republic of	2002	5.8
Kyrgyzstan	2005/06	0.5
Lao PDR	2000	0.5
Lesotho	2009	9.4
Liberia	2007	1.6
Madagascar	2008/09	1.1
Malawi	2006	1.5
Mali	2006	0.4
Mauritania	2007	0.4
Mozambique	2003/04	1.1
Myanmar	2007	0.7
Nepal	2006	4.8
Nicaragua	2006/07	3.8
Niger	2006	0.0
Nigeria	2008	2.4
Pakistan	2007/08	5.4
Papua New Guinea	2006	-
Rwanda	2007/08	1.9
Sao Tome and Principe	2008/09	5.0
Senegal	2005	1.5
Sierra Leone	2008	0.6
Solomon Islands	2006/07	1.5
Somalia	2005/06	0.0
Sudan	2006	0.3
Tajikistan	2007	1.3

(Continued)

Annex 13 - Continued

	Male Condom Use	
	Year	Prevalence (%)
Tanzania	2010	2.3
The Gambia	2001	0.5
Togo	2006	3.8
Uganda	2006	1.7
Uzbekistan	2006	2.1
Vietnam	2007	8.3
Yemen	2006	0.4
Zambia	2007	4.7
Zimbabwe	2005/06	1.4
GAVI-graduating (16 countries)		
Angola	2001	0.3
Armenia	2005	8.1
Azerbaijan	2006	2.2
Bhutan	2000	1.2
Bolivia	2008	4.0
Congo, Republic of	2005	8.9
Cuba	2006	10.6
Georgia	2005	8.7
Honduras	2005/06	2.9
Indonesia	2007	1.3
Kiribati	2000	0.4
Mongolia	2005	5.3
Republic of Moldova	2005	7.4
Sri Lanka	2006/07	5.5
Timor-Leste	2009/10	0.2
Ukraine	2007	23.8

Prev: prevalence.
GAVI-eligible countries: GNI per capita <= 1,500U$; GAVI-graduating countries: GNI per capita > 1,500U$ but they have a final opportunity in 2011 to apply for GAVI support.
Data sources: United Nations Contraceptive 2011.

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