ICO Information Centre on HPV and Cancer

INDICATOR GUIDELINES

December 15th, 2014

Contents

1 Introduction

The ICO Information Centre on HPV and Cancer (HPV Information Centre) is a joint effort between WHO's Immunization, Vaccines and Biologicals (IVB) department and the Cancer Epidemiology Research Program (CERP) of the Institut Català d'Oncologia (ICO) to accelerate the introduction of HPV vaccines in countries with the highest burden of cervical cancer and reduce the incidence of this disease and related lesions among women.

Aggregated information is derived from data and official reports produced by the World Health Organization (WHO), International Agency for Research on Cancer (IARC), United Nations, The World Bank, and published literature. Indicators include relevant statistics on HPV-related cancer sites, epidemiological determinants of cervical cancer such as demographics, socioeconomic factors and other risk factors, estimates on the burden of HPV infection, data on immunization and cervical cancer screening. These statistics are essential when planning and implementing cervical cancer prevention strategies. The indicators are presented under an integrated report and on a website (www.hpvcentre.net) to provide a user-friendly tool to assess the best available information in each country.

The relevant methodological aspects of how indicators were generated are described in this guideline. Indicators are defined, data sources are referenced, and relevant methodological aspects are also included.

2 Region and Country Definitions

2.1 Member States, by sub-regions

Countries have been grouped into either developed and developing regions, five continents (Africa, Americas, Asia, Europe, and Oceania) and 21 sub-regions outlined by the United Nations for geographic disaggregation of the statistics (http://unstats.un.org/unsd/methods/m49/m49regin.htm). The categorization of countries or areas is for statistical convenience and does not imply any assumption regarding political or other affiliation of countries or territories by the United Nations or the ICO Information Centre on HPV and Cancer.

Table 1: Developed and developing regions classification.

Classification	Regions
Developed regions	Northern America, Europe, Japan, Australia and New Zealand
Developing regions	Africa, Americas (excluding Northern America), Caribbean, Central America, South America, Asia excluding Japan, and Oceania excluding Australia and New Zealand

Table 2: Member States, by sub-regions.

Continent	Region	Countries
Africa	Eastern Africa	Burundi, Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Mayotte, Mozambique, Réunion, Rwanda, Seychelles, Somalia, South Sudan, Uganda, United Republic of Tanzania, Zambia, Zimbabwe
	Middle Africa	Angola, Cameroon, Central African Republic, Chad, Congo, DR Congo, Equatorial Guinea, Gabon, Sao Tome & Principe
	Northern Africa	Algeria, Egypt, Libya, Morocco, Sudan, Tunisia, Western Sahara
	Southern Africa	Botswana, Lesotho, Namibia, South Africa, Swaziland
	Western Africa	Benin, Burkina Faso, Cape Verde, Côte d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone, St Helena, Togo
America	Caribbean	Anguilla, Antigua & Barbuda, Aruba, Bahamas, Barbados, Saint Eustatius and Saba Bonaire, British Virgin Islands, Cayman Island, Cuba, Curaçao, Dominica, Dominican Republic, Grenada, Guadeloupe, Haiti, Jamaica, Martinique, Montserrat, Puerto Rico, Saint Kitts & Nevis, Saint Lucia, Saint Vincent & The Grenadines, St-Bartholemy, St-Martin (French part), Sint Maarten (Dutch part), Trinidad & Tobago, Turks & Caicos Islands, US Virgin Islands
	Central America	Belize, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama
	South America	Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Falkland Islands (Malvinas), French Guiana, Guyana, Paraguay, Peru, Suriname, Uruguay, Venezuela
	Northern America	Bermuda, Canada, Greenland, St Pierre and Miquelon, United States of America
Asia	Eastern Asia	China, Hong Kong SAR, Macao SAR, DPR Korea, Japan, Mongolia, Republic of Korea
	South-Eastern Asia	Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, Timor-Leste, Viet Nam
	Southern Asia	Afghanistan, Bangladesh, Bhutan, India, Iran, Maldives, Nepal, Pakistan, Sri Lanka
	Central Asia	Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan
	Western Asia	Armenia, Azerbaijan, Bahrain, Georgia, Iraq, Israel, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Syria, Turkey, United Arab Emirates, Yemen
Europe	Eastern Europe	Belarus, Bulgaria, Czech Republic, Hungary, Poland, Republic of Moldova, Romania, Russian Federation, Slovakia, Ukraine
	Northern Europe	Åland Islands, Channel Islands, Denmark, Estonia, Faeroe Islands, Finland, Guernsey, Iceland, Ireland, Isle of Man, Jersey, Latvia, Lithuania, Norway, Sark, Svalbard & Jan Mayen Islands, Sweden, United Kingdom
	Southern Europe	Albania, Andorra, Bosnia & Herzegovina, Croatia, Cyprus, Gibraltar, Greece, Holy See, Italy, Macedonia TFYR, Malta, Montenegro, Portugal, San Marino, Serbia, Slovenia, Spain
	Western Europe	Austria, Belgium, France, Germany, Liechtenstein, Luxembourg, Monaco, Netherlands, Switzerland
Oceania	Australia/New Zealand	Australia, New Zealand, Norfolk Island
	Melanesia	Fiji, New Caledonia, Papua New Guinea, Solomon Islands, Vanuatu
	Micronesia	Guam, Kiribati, Marshall Islands, Micronesia, Nauru, N Mariana Islands, Palau
	Polynesia	American Samoa, Cook Islands, French Polynesia, Niue, Pitcairn, Samoa, Tokelau, Tonga, Tuvalu, Wallis & Futuna Islands

3 Glossary of cancer sites, histologies and cytology

3.1 Histology/cytology of the cervix

Terminology

Cytologically normal women

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

Cervical Intraepithelial Neoplasia (CIN) / Squamous Intraepithelial Lesions (SIL)

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

Low-grade cervical lesions (LSIL/CIN-1)

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

High-grade cervical lesions (HSIL/ CIN-2 / CIN-3 / CIS)

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

Carcinoma in situ (CIS)

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

Invasive cervical cancer (ICC) / Cervical cancer

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

Invasive squamous cell carcinoma

Invasive carcinoma composed of cells resembling those of squamous epithelium.

Adenocarcinoma

Invasive tumour with glandular and squamous elements intermingled.

3.2 Other anogenital cancers

Terminology

Cancer of the anus
Cancer that forms in tissues of the anus, which is the opening of the rectum (last part of the large intestine) to the outside of the body.

Cancer of the penis
Cancer that forms on the skin or in the tissues of the penis.

Cancer of the vagina
Cancer that forms in the tissues of the vagina (birth canal). The vagina leads from the cervix (the opening of the uterus) to the outside of the body.

Cancer of the vulva
Cancer of the vulva occurs in the external female genital organs which include the clitoris, vulvar lips, and the opening to the vagina.

3.3 Head and Neck cancers

Terminology

Oral cavity cancer
Cancer that forms in tissues of the oral cavity (the mouth). The tissues of the oral cavity include the lips, the lining inside the cheeks and lips, the front two thirds of the tongue, the upper and lower gums, the floor of the mouth under the tongue, the bony roof of the mouth, and the small area behind the wisdom teeth.

Pharyngeal cancer
Cancer that forms in tissues of the pharynx, which is the hollow tube inside the neck that starts behind the nose and ends at the top of the windpipe and oesophagus. Pharyngeal cancer includes cancer of the nasopharynx (the upper part of the throat behind the nose), the oropharynx (the middle part of the pharynx), and the hypopharynx (the bottom of the pharynx). Cancer of the larynx (voice box) may also be included as a type of pharyngeal cancer.

4 Cancer statistics

Table 3: Classification of cancer sites.

Cancer	International Classification of Disease (ICD, 10th revision) code	
	GLOBOCAN 2012	Cancer Incidence 5 Continents
Cervical	C53	C53
Anal	Not available	C21
Vulvar	Not available	C51
Vaginal	Not available	C52
Penile	Not available	C60
Oral Cavity	C00-C08	Not shown
Pharynx (excluding nasopharynx)	C09-C10,C12-C14	Not shown

4.1 Incidence

Incidence is the number of new cases that occurs during a given period of time in a specified population. It can be expressed as an absolute number of cases per year or as a rate per 100,000 persons per year.

Incidence data are available from cancer registries. They cover entire national populations, or samples of such populations from selected regions.

Crude incidence rate
For a specific cancer site and population, a crude rate is calculated by dividing the number of new cancers observed during a given time period by the corresponding number of people at risk in the population. The result is usually given as a rate per 100000 person-years of observation.

This rate is called crude because it relates to each population as a whole and is influenced by the age structure of each population.

It cannot be used for comparison purposes.

Age-specific incidence rate
The age-specific rate in each age class can be calculated by dividing the number of cases in the age-class by the corresponding population.

Age-specific incidence rates should always be the starting point and foundation of any thorough analysis of the incidence data.

Age-standardised incidence rate
The age-standardised rate is a summary of the individual age-specific rates using an external population called a standard population. This is the incidence that would be observed if the population had the age structure of the standard population, and corresponds to the crude incidence rate in the standard population. The age-standardised incidence rate is expressed, as is the crude incidence rate, as the number of new cases per 100 000 person-years.

The standard worldwide used is the Segi standard population (Segi, 1960).

It should be stressed that the objective of age standardisation is essentially to establish rates for comparison purposes.

Cumulative Risk
The cumulative rate is an approximation of the probability to develop a cancer during a certain period-for example, a lifetime. For cancer, it is often expressed as the risk accumulated over the age period 0-74. This has the advantage of summarising the age-specific rates independently of the age structure of the population, and gives the probability of an individual developing a cancer. This calculation is theoretical and assumes that no death occurs in the period, and that the age-specific incidence rates will be stable for an individual.

Like the age-standardised rate, it permits comparisons between populations with different age structures.

The cumulative risk is expressed as a percentage.

Annual number of new cancer cases
The number of new cases that occurs during a given period of time in a specified population. Usually they are expressed as an absolute number of cases per year.

In the HPV Information Centre, cancer incidence data presented are only from the cancer registries compiled by the International Agency for Research on Cancer (IARC).

Cancer data are always collected and compiled sometime after the events to which they relate, so that the most recent statistics available are always 'late'. GLOBOCAN 2012 presents estimates for the year 2012. However, although the populations of the different countries are those estimated for the middle of 2012, the disease rates are not those for the year 2012, but from the most recent data available, generally 2-5 years earlier.

In Cancer Incidence in Five Continents (CI5), Volume X, numbers of cancer cases are reported for the period 2003-2007.

These estimates are based on the most recent incidence data available at IARC, but more recent figures may be available directly from local sources.

Ranking of cervical cancer among other cancers
The order of frequency of cervical cancer resulting of sorting crude incidence rates by cancer site. Reflects burden of disease. Ranking based on age-standardized rates may differ.

Data Sources
Cancer incidence from cancer registries
Forman D, Bray F, Brewster DH, Gombe Mbalawa C, Kohler B, Piñeros M, Steliarova-Foucher E, Swaminathan R and Ferlay J., eds (2013) Cancer Incidence in Five Continents, Vol. X (electronic version) Lyon, IARC.

Ferlay J, Soerjomataram I, Ervik M, Dikshit R, Eser S, Mathers C, Rebelo M, Parkin DM, Forman D, Bray, F. GLOBOCAN 2012 v1.0, Cancer Incidence and Mortality Worldwide: IARC CancerBase No. 11 [Internet]. Lyon, France: International Agency for Research on Cancer; 2013. Available from: http://globocan.iarc.fr

Disaggregation
Age and sex

Comments
None

4.2 Mortality

Mortality is the number of deaths occurring in a given period in a specified population. It can be expressed as an absolute number of deaths per year or as a rate per 100,000 persons per year.

Mortality data by cause are available for many countries through the registration of vital events, although the degree of detail and quality of the data vary considerably.

Crude mortality rate
For a specific cancer site and population, a crude rate is calculated by dividing the number of cancer deaths observed during a given time period by the corresponding number of people at risk in the population. The result is usually given as a rate per 100000 person-years of observation.

This rate is called crude because it relates to each population as a whole and is influenced by the age structure of each population.

It cannot be used for comparison purposes.

Age-specific mortality rate
The age-specific rate in each age class can be calculated by dividing the number of deaths in the age-class by the corresponding population.

Age-specific mortality rates should always be the starting point and foundation of any thorough analysis of the mortality data.

Age-standardised mortality rate
The age-standardised rate is a summary of the individual age-specific rates using an external population called a standard population. This is the mortality that would be observed if the population had the age structure of the standard population, and corresponds to the crude mortality rate in the standard population. The age-standardised mortality rate is expressed, as is the crude mortality rate, as the number of deaths per 100 000 person-years.

The standard worldwide used is the Segi standard population (Segi, 1960).

It should be stressed that the objective of age standardisation is essentially to establish rates for comparison purposes

Cumulative Risk
The cumulative rate is an approximation of the probability of dying from a cancer during a certain period-for example, a lifetime. For cancer, it is often expressed as the risk accumulated over the age period 0-74. This has the advantage of summarising the age-specific rates independently of the age structure of the population, and gives the probability of an individual dying from a cancer. This calculation is theoretical and assumes assuming no other causes of death are in operation, and that the age-specific mortality rates will be stable for an individual.

Like the age-standardised rate, it permits comparisons between populations with different age structures.

The cumulative risk is expressed as a percentage.

Annual number of deaths
The number of deaths that occurs during a given period of time in a specified population. Usually they are expressed as an absolute number of deaths per year.

In the HPV Information Centre, cancer mortality data presented are compiled by the International Agency for Research on Cancer (IARC) from country-specific national mortality data. These estimates are based on the most recent mortality data available at IARC, but more recent figures may be available directly from local sources.

Ranking of cervical cancer among other cancers
The order of frequency of cervical cancer resulting of sorting crude mortality rates by cancer site. Reflects burden of disease. Ranking based on age-standardized rates may differ.

Data Sources
Ferlay J, Soerjomataram I, Ervik M, Dikshit R, Eser S, Mathers C, Rebelo M, Parkin DM, Forman D, Bray F. GLOBOCAN 2012 v1.0, Cancer Incidence and Mortality Worldwide: IARC CancerBase No. 11 [Internet]. Lyon, France: International Agency for Research on Cancer; 2013. Available from: http://globocan.iarc.fr, accessed on 15/01/2014.
For specific estimation methodology refer to http://globocan.iarc.fr/DataSource_and_methods.asp.
Age-specific data from GLOBOCAN 2012 were obtained from IARC, personal communication.

Disaggregation
Age and sex

Comments
None

5 Human papillomavirus (HPV) related statistics

Definitions

HPV Prevalence

HPV prevalence is the proportion of subjects infected by the human papillomavirus (HPV) according to an HPV DNA test at a specific time point.

Type-specific HPV prevalence

HPV-type prevalence is the proportion of subjects infected by a specific HPV genotype according to a type-specific HPV DNA test at a given time point.

Data source

HPV Infection statistics in the HPV Information Centre are generated from the findings of systematic review of the literature. Systematic reviews of the literature are performed at the Institut Català d´Oncologia or the International Agency for Research on Cancer. These reviews have been published in the peer-reviewed literature, and the resulting papers represent the basis of further updates. Once initially published, all these analyses are periodically updated and uploaded in the website. Table 4 presents the different sections of HPV infection statistics and their reference publications.

Table 4: Reference publications for HPV prevalence and type distribution statistics by site and lesion

Site/lesion for HPV prevalence statistics	References	Date of update of the most recent original publication	Date of update HPV Information centre at 31/12/2014
Women with normal cytology	Bruni L, Diaz M, Castellsagué X, Ferrer E, Bosch FX, de Sanjosé S. Cervical human papillomavirus prevalence in 5 continents: meta-analysis of 1 million women with normal cytological findings. J Infect Dis. 2010;202(12):1789-99. De Sanjosé S, Diaz M, Castellsagué X, Clifford G, Bruni L, Munoz N, Bosch FX. Worldwide prevalence and genotype distribution of cervical human papillomavirus DNA in women with normal cytology: a meta-analysis. Lancet Infect Dis. 2007;7(7):453-9.	May 2009	Oct 2014
Low-grade cervical lesions	Guan P, Howell-Jones R, Li N, Bruni L, de Sanjosé S, Franceschi S, Clifford GM. Human papillomavirus types in 115,789 HPV-positive women: a meta-analysis from cervical infection to cancer. Int J Cancer. 2012;131(10):2349-59. Clifford GM, Rana RK, Franceschi S, Smith JS, Gough G, Pimenta JM. Human papillomavirus genotype distribution in low-grade cervical lesions: comparison by geographic region and with cervical cancer. Cancer Epidemiol Biomarkers Prev. 2005;14(5):1157-64.	Nov 2011	Jun 2014

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(Table 4 – continued from previous page)

Site/lesion for HPV prevalence statistics	References	Date of update of the most recent original publication	Date of update HPV Information centre at 31/12/2014
High-grade cervical lesions	Guan P, Howell-Jones R, Li N, Bruni L, de Sanjosé S, Franceschi S, Clifford GM. Human papillomavirus types in 115,789 HPV-positive women: a meta-analysis from cervical infection to cancer. Int J Cancer.2012;131(10):2349-59. Smith JS, Lindsay L, Hoots B, Keys J, Franceschi S, Winer R, Clifford GM. Human papillomavirus type distribution in invasive cervical cancer and high-grade cervical lesions: a meta-analysis update. Int J Cancer. 2007;121(3):621-32. Clifford GM, Smith JS, Aguado T, Franceschi S. Comparison of HPV type distribution in high-grade cervical lesions and cervical cancer: a meta-analysis. Br J Cancer. 2003 Jul 7;89(1):101-5.	Nov 2011	Jun 2014
Invasive cervical cancer	Guan P, Howell-Jones R, Li N, Bruni L, de Sanjosé S, Franceschi S, Clifford GM. Human papillomavirus types in 115,789 HPV-positive women: a meta-analysis from cervical infection to cancer. Int J Cancer. 2012;131(10):2349-59. Li N, Franceschi S, Howell-Jones R, Snijders PJ, Clifford GM. Human papillomavirus type distribution in 30,848 invasive cervical cancers worldwide: Variation by geographical region, histological type and year of publication. Int J Cancer. 2011;128(4):927-35. Smith JS, Lindsay L, Hoots B, Keys J, Franceschi S, Winer R, Clifford GM. Human papillomavirus typedistribution in invasive cervical cancer and high-grade cervical lesions: a meta-analysis update. Int J Cancer. 2007;121(3):621-32. Clifford GM, Smith JS, Plummer M, Munoz N, Franceschi S. Human papillomavirus types in invasive cervical cancer worldwide: a meta-analysis. Br J Cancer. 2003;88(1):63-73. Clifford GM, Smith JS, Aguado T, Franceschi S. Comparison of HPV type distribution in high-grade cervical lesions and cervical cancer: a meta-analysis. Br J Cancer. 2003 Jul 7;89(1):101-5.4.	Nov 2011	Jun 2014
Anal, vulvar, vaginal cancers and precancerous lesions	Bouvard V, Baan R, Straif K, Grosse Y, Secretan B, El Ghissassi F, Benbrahim-Tallaa L, Guha N, Freeman C, Galichet L, Cogliano V,on behalf of the WHO International Agency for Research on Cancer Monograph Working Group. 2012. A review of human carcinogens-Part B: biological agents.	2008	Jan/Jun 2014

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(Table 4 – continued from previous page)

Site/lesion for HPV prevalence statistics	References	Date of update of the most recent original publication	Date of update HPV Information centre at 31/12/2014
	De Vuyst H, Clifford GM, Nascimento MC, Madeleine MM, Franceschi S. Prevalence and type distribution of human papillomavirus in carcinoma and intraepithelial neoplasia of the vulva, vagina and anus: a meta-analysis. Int J Cancer. 2009;124(7):1626-36		
Penile cancer and precancerous lesions	Bouvard V, Baan R, Straif K, Grosse Y, Secretan B, El Ghissassi F, Benbrahim-Tallaa L, Guha N, Freeman C, Galichet L, Cogliano V,on behalf of the WHO International Agency for Research on Cancer Monograph Working Group. 2012. A review of human carcinogens-Part B: biological agents Miralles-Guri C, Bruni L, Cubilla AL, Castellsagué X, Bosch FX, de Sanjosé S. Human papillomavirus prevalence and type distribution in penile carcinoma. J Clin Pathol. 2009 Oct;62(10):870-8.	2008	Jan/Jun 2014
Anogenital sites in Men from the general population or from special subgroups	Smith JS, Gilbert PA, Melendy A, Rana RK, Pimenta JM. Age-specific prevalence of human papillomavirus infection in males: a global review. J Adolesc Health. 2011 Jun;48(6):540-52. Dunne EF, Nielson CM, Stone KM, Markowitz LE, Giuliano AR. Prevalence of HPV infection among men: A systematic review of the literature. J Infect Dis 2006;194:1044–57. Olesen TB, Munk C, Christensen J, Andersen KK, Kjaer SK. Human papillomavirus prevalence among men in sub-Saharan Africa: a systematic review and meta-analysis. Sex Transm Infect 2014. Hebnes JB, Olesen TB, Duun-Henriksen AK, Munk C, Norrild B, Kjaer SK. Prevalence of Genital Human Papillomavirus among Men in Europe: Systematic Review and Meta-Analysis. J Sex Med 2014;11:2630–44.	Jun 2009	Mar 2014
Oral and pharyngeal cancers	Ndiaye C, Mena M, Alemany L, Arbyn M, Castellsagué X, Laporte L, et al. HPV DNA, E6/E7 mRNA, and p16INK4a detection in head and neck cancers: a systematic review and meta-analysis. Lancet Oncol 2014;15:1319–31. Kreimer AR, Clifford GM, Boyle P, Franceschi S. Human papillomavirus types in head and neck squamous cell carcinomas worldwide: a systematic review. Cancer Epidemiol Biomarkers Prev 2005;14:467–75.	Feb 2012	Feb 2012
Oral cavity in men and women from the general population	Kreimer AR, Bhatia RK, Messeguer AL, González P, Herrero R, Giuliano AR. Oral human papillomavirus in healthy individuals: a systematic review of the literature. Sex Transm Dis 2010;37:386–91.	Jun 2009	2012 (Europe)

Methods of estimation
HPV prevalence estimates are computed following the methodology of the papers above (table 4) and as follows.

Systematic review of the literature
The HPV Information Centre follows standardized procedures to review the literature (Figure 1). First search is performed through MESH terms and key words depending on the indicator in search engines such as Pubmed or Scopus. Other search engines include LILACS, IME, Google scholar. A first screening round is done using were very sensitive search terms but unspecific, such as “HPV”. Additionally, to improve specificity, a second round of searches and screening is made specifying the generic search terms as before but together with the name of each country one by one.

Selection of papers is done according to pre-established inclusion/exclusion criteria (Table 2). A first triage is done by title and abstract, but a second triage is done at full text level. Full texts are also screened for further references that may meet inclusion criteria but are missed by search engines.

Quality control ensures that at least a fraction of the papers are reviewed by another reviewer as well. Discrepancies and doubts are resolved by consensus within the reviewers. Eventually, authors are requested to provide further detail of data if targeted data is incomplete. Data is entered in the system database by the reviewers themselves and afterwards is validated and statistically analysed.

Figure 1: Algorithm for the systematic review

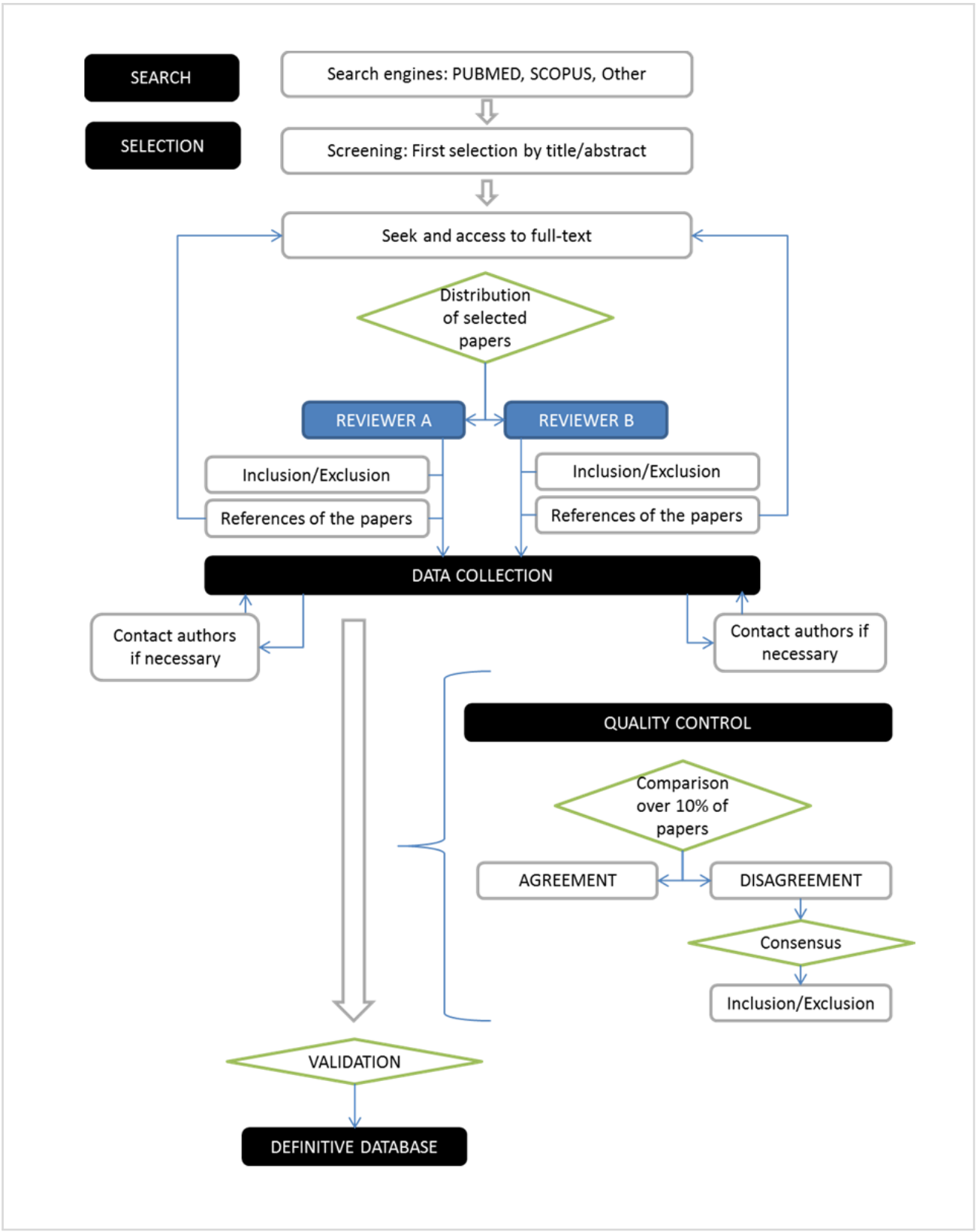

Table 5: Search terms and inclusion and exclusion criteria for HPV statistics

Site/lesion for HPV prevalence statistics	Generic search terms	Criteria
Women with normal cytology	1st round: "HPV" AND "cerv*" 2nd round: "HPV" AND specific country name	Detailed description of HPV detection methodology HPV DNA detection by means of PCR or HC2 Minimum number of cases: - Initially (until 2009): at least 100 cases - 2011-onwards: • 100 cases in the absence of other studies in the country • Same magnitude or more cases than studies already included in the country (USA/Canada, pending Europe)
Low- and high-grade cervical lesions	1st round: "HPV" AND "cerv*" 2nd round: "HPV" AND specific country name	Detailed description of HPV detection methodology HPV DNA detection by means of PCR Genotype distribution performed. Since 2011 only studies genotyping at least 2 HPV types in the absence of other studies in the country, otherwise at least 5 genotypes tested Minimum number of cases: - Initially (until 2011): At least 20 - 2011-onwards: 20 cases in the absence of other studies in the country, otherwise at least 100 cases tested
Invasive cervical cancer	1st round: "HPV" AND "cerv*" 2nd round: "HPV" AND specific country name	Detailed description of HPV detection methodology HPV DNA detection by means of PCR Genotype distribution performed. Since 2011 only studies genotyping at least 2 HPV types in the absence of other studies in the country, otherwise at least 5 genotypes tested Minimum number of cases: - Initially (until 2011): At least 20 cases - 2011-onwards: 20 cases in the absence of other studies in the country, otherwise at least 50 cases tested
Anal, penile, vulvar, vaginal cancers and precancerous lesions	"HPV" AND ("anus" OR "anal") OR ("penile") OR "vagin*" OR "vulv*"	Detailed description of HPV detection methodology HPV DNA detection by means of PCR Genotype distribution performed Minimum number of cases: at least 10 cases
Anogenital sites in Men from the general population or from special subgroups		Detailed description of HPV detection methodology HPV DNA detection by means of PCR or HC2. (ISH si no dades pais)

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(Table 5 – continued from previous page)

Site/lesion for HPV prevalence statistics	Generic search terms	Criteria
Oral and pharyngeal cancers	"papillomaviridae" and "head and neck neoplasms" in combination with keywords "polymerase chain reaction" or "PCR"	Detailed description of HPV detection methodology HPV DNA detection by means of PCR At least one of the following cancer sites or subsites: oral cavity, oropharynx, hypopharynx, and larynx Identification of the histological classification as squamous cell carcinoma Primary tumour Diagnosis of a tumour confined in only one site Minimum number of cases: at least 20 cases

Statistical analysis

For each study included in any of the categories above, at least the following data are collected: the number of cases tested, the number of cases positive for HPV, the number of cases positive for each specific HPV type tested, and the HPV detection technique. These numbers can be stratified by age group in the case of women with normal cytology, histology in the case of cancers, sex when applicable and some special populations such as MSM or HIV.

The number of cases tested and HPV positive extracted for each study are pooled to estimate the prevalence of HPV DNA and the HPV type distribution by country, geographical region and globally. Pools are made by the summation of the number of cases positives for HPV divided by the summation of cases tested from all the studies. HPV prevalences are presented as percentages and binomial 95% confidence intervals using the score method (Wilson) are calculated for each of them.

Disaggregation

Data are presented disaggregated by sex, age and histological groups (squamous cell carcinoma, adenocarcinoma, and unspecified histology) when available.

Comments

Because of limitations of the HPV DNA detection techniques and study designs used, data should be interpreted cautiously and used only as a guidance to assess the burden of HPV infection in the population.

6 Factors contributing to HPV-related cancers

6.1 Smoking (Current smoking of any tobacco prevalence, Daily smoking of any tobacco prevalence, Current cigarette smoking prevalence, Daily cigarette smoking prevalence)

6.2 Smoking (Current smoking of any tobacco prevalence, Daily smoking of any tobacco prevalence, Current cigarette smoking prevalence, Daily cigarette smoking prevalence)

Definitions
The percentage of men and women who smoke:

Smoking any tobacco product
Smoking any form of tobacco, including cigarettes, cigars, pipes, bidis, kreteks, etc.

Smoking cigarettes
Smoking manufactured cigarettes.

Current smoking
Smoking at the time of the survey, including daily and non-daily smoking.

Daily smoking
Smoking every day at the time of the survey.

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

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

Disaggregation
Sex

Comments
None

6.3 Parity

Definitions
Parity is the number of times a woman has given birth. High parity has been associated with an increased risk of invasive cervical cancer.

Total fertility rate
Total fertility rate is the average number of live births per woman, assuming the age-specific fertility rate observed in a given year or period.

Age-specific fertility rate
Age-specific fertility rate is the annual number of births per 1000 women in a particular age group in a given year or period.

Data Sources
United Nations, Department of Economic and Social Affairs, Population Division. World Fertility Data 2008. (POP/DB/Fert/Rev2008). Available at:
http://www.un.org/esa/population/publications/WFD%202008/Main.html [Accessed on July 2013]

Methods of estimation
United Nations, Department of Economic and Social Affairs, Population Division. World Fertility Data 2008. (POP/DB/Fert/Rev2008). Available at:
http://www.un.org/esa/population/publications/WFD%202008/Main.html [Accessed on July 2013]

Disaggregation
Age

Comments
None

6.4 Oral Contraceptive Use

Refer to Contraceptive Use (7.4) in the Reproductive Health section of the indicator guidelines for definition, source and methods of estimation.

6.5 Human immunodeficiency virus (HIV) prevalence

Definitions

Adults and children HIV estimates
Estimated number of adults (15+ years) and children (0-14 years) living with HIV.

Adults (15+ years) HIV estimate
Estimated number of adults (15+ years) living with HIV.

Adults (15-49 years) HIV prevalence (%)
The percentage of adults aged 15-49 years living with HIV.

Women (15+ years) HIV estimate
Estimated number of women (15+ years) living with HIV.

Young women (15-24 years) HIV rate (%)
Estimated percentage of young women aged 15-24 living with HIV .

Young men (15-24 years) HIV rate (%)
Estimated percentage of young men aged 15-24 living with HIV.

AIDS deaths in adults and children
Estimated number of AIDS deaths in adults (15+ years) and children (0-14 years).

HIV prevalence among female sex workers in the capital city
Estimated percentage of female sex workers in the capital city living with HIV.

HIV prevalence among men who sex with men in capital city
Estimated percentage of men who have sex with men in the capital city living with HIV.

Data Sources

2012 UNAIDS Report on the Global AIDS Epidemic
(http://www.unaids.org/en/resources/campaigns/20121120_globalreport2012/globalreport)

Methods of estimation

The estimates have been produced and compiled by UNAIDS/WHO. General methodology for estimates have been described in Sexually Transmitted Infections, "Improved methods and tools for HIV/AIDS estimates and projections," 2003, 82 (Suppl) and 2004, 80 (Suppl). The estimates are based on methods and parameters that are informed by the UNAIDS Reference Group on HIV/AIDS Estimates, Modelling and Projections, available at http://www.epidem.org

Disaggregation
None

Comments
Estimates include all people with HIV infection, regardless of whether they have developed symptoms of AIDS in 2007. For some countries where sufficient data from the last six years were not available, no estimates have been made.

6.6 HIV antiretroviral therapy coverage

Estimated number of people receiving antiretroviral therapy

Estimated antiretroviral therapy coverage (%)

Definition
Number and percentage of people receiving antiretroviral (ARV) therapy according to nationally approved treatment protocol (or WHO/Joint UN Programme on HIV and AIDS standards) among the estimated number of people with advanced stages of HIV infection.

Data Sources
World Health Statistics 2006 (http://www.who.int/whosis/en); Progress on global access to HIV antiretroviral therapy. A report on ′3 by 5′ and beyond. Geneva, World Health Organization and Joint United Nations Programme on HIV/AIDS, March 2006.

Methods of estimation
Coverage is estimated from models that are used to calculate HIV prevalence, incidence and mortality estimates. The number of adults with advanced stages of HIV infection who need to start therapy is estimated as the number of AIDS cases in the current year times two.

The total number of adults needing ARV therapy is estimated by aggregating the number of adults who need to start therapy, the number of adults in the prior year plus those who have survived in the current year.

Disaggregation
None

Comments
The accuracy of reported number of people needing ARV therapy needs to be improved as monitoring systems are still developing.

Types of therapy are not distinguished and it does not measure cost, quality or effectiveness of treatment. Therapies preventing mother-to-child-transmission are not included in this estimate.

7 Sexual and reproductive health indicators

7.1 Time of sexual intercourse/High-risk sexual behaviour

Definitions

Time of sexual intercourse

Median age at first sexual intercourse among young men and women
The age by which half of young people aged 15-24 have had penetrative sex (median age).

Median age at first sexual intercourse among men (25-54 years) and women (25-49 years)
The age by which half of people aged 25-54 years have had penetrative sex (median age).

Sex before age of 15
% of young people aged 15-24 who had penetrative sexual intercourse before the age of 15.

Abstinence of never-married young men and women
Proportion of never married young women and men aged 15-24 who have never had sex.

High-risk sexual behaviour

Extramarital sex
Percentage of respondents who have had sex with a non-marital, non-cohabiting partner in the last 12 months of all respondents who have reported sexual activity in the last 12 months.

Commercial sex in the last year
Percentage of male respondents reporting sex with a sex worker in the last 12 months.

Multiple partners in the last year among sexually active respondents aged 15-49
Percentage of women and men age 15-49 who have had sexual intercourse with more than one partner in the last 12 months, among respondents aged 15-49, who were sexually active in the last 12 months.

Data Sources

Welling K, Collumbien M, Slaymaker E, Singh S, Hodges Z, Patel D, Bajos N. Sexual behaviouir in context: a global perspective. Lancet 2006; 368(9548):1706-28.

Estimates are derived from available survey data from nationally representative population-based surveys undertaken such as the MEASURE DHS (Demographic and Health Surveys, http://www.measuredhs.com) project, national survey data, and from Reproductive Health Surveys.

Methods of estimation
Methods are specific to each survey used. Refer to country-specific reference for full description of methodologies used.

Disaggregation
Age and sex

Comments
None

7.2 Marriage Patterns

Definitions

Average Age at first marriage
Average age at which men or women ever married between the ages of 15 and 50 years, an age after which first marriages are rare.

Percentage of ever married, (%)
Proportion of ever married persons aged 15-19, 20-24, and 40-48.

Difference in Average Age at First Marriage between Men and Women
% of young people aged 15-24 who had penetrative sexual intercourse before the age of 15.

Data Sources
UN 2009: United Nations, Department of Economic and Social Affairs, Population Division (2009). World Marriage Data 2008 (POP/DB/Marr/Rev2008)
(http://www.un.org/esa/population/publications/WMD2008/Main.html)

Methods of estimation
Estimates are derived from censuses, surveys, and civil registries. The data is housed within databases maintained by the Population Division and the Statistics Division of the United Nations Department of Economic and Social Affairs.

Disaggregation
Age and sex

Comments
None

7.3 Women aged 15-49, married or in union

Definition
Number of women of reproductive age (15-49 years) who are married or in a union. A union is involves a man and a woman regularly cohabiting in a marriage-like relationship.

Data Sources
UN 2009: United Nations, Department of Economic and Social Affairs, Population Division (2009). World Marriage Data 2008 (POP/DB/Marr/Rev2008)
(http://www.un.org/esa/population/publications/WMD2008/Main.html)

Methods of estimation
Empirical data derived from surveys collected in 1985 or later based on nationally representative samples of women of reproductive age. For country estimates, the most recent data came from the United Nations Population Division based on survey data. Weights used are the estimated numbers of women aged 15-49 who are married or in a consensual union in 2007.
The number of women of reproductive age who are married or in a consensual union was estimated based on data on the proportion of women married or in union in each country contained in World Marriage Data 2006 and on estimates of the number of women by age group obtained from World Population Prospects: The 2006 Revision.

Disaggregation
None

Comments
None

7.4 Contraceptive Use

Definitions

Any contraceptive use, (%)
Contraceptive prevalence is the proportion of women who are using (or whose partner is using) a contraceptive method among those of reproductive age (15-49 years) who are married or in union. Annual change reported for the period 1997 to 2007.

Prevalence of modern methods, (%)
Prevalence of modern methods is the proportion of women using modern method contraception among those of reproductive age (15-49 years) who are married or in union. Annual change reported for the period 1997 to 2007.
Modern methods include: sterilization (male/female); oral contraceptives/pill; injectable or implant; intrauterine device (IUD); condoms; vaginal barrier methods (diaphragms, cervical caps and spermicidal foams, jelly, cream and sponges); other methods (emergency contraception, female condom and modern methods not reported separately).

Sterilization, (%)
Proportion of women or male partners who were sterilized, among women of reproductive age (15-49 years) who are married or in union.

Oral Contraceptive Use / Pill, (%)
Proportion of women using oral contraceptives, also known as the pill, among those of reproductive age (15-49 years) who are married or in union.

Injectable or implant, (%)
Proportion of women using hormonal contraception in the form of injections or implants, among those of reproductive age (15-49 years) who are married or in union.

Intrauterine device (IUD), (%)
Proportion of women using intrauterine device as a form of birth control among those of reproductive age (15-49 years) who are married or in union.

Condom use, (%)
Proportion of male partners who are using condoms with their female partners of reproductive age (15-49 years) who are married or in union.

Vaginal barrier method, (%)
Proportion of women using barrier methods among those of reproductive age (15-49 years) who are married or in union.
Vaginal barrier methods include diaphragms, cervical caps and spermicidal foams, jelly, cream and sponges.

Other modern methods, (%)
Proportion of women using other methods among those of reproductive age (15-49 years) who are married or in union. Other modern methods include emergency contraception, female condom and modern methods not reported separately.

Contraception of other traditional methods, (%)
Proportion of women using traditional methods among those of reproductive age (15-49 years) who are married or in union.
Traditional methods include rhythm (periodic abstinence or the calendar method), withdrawal and other methods (Including prolonged abstinence, breastfeeding, douching, various folk methods and traditional methods not reported separately).

Rhythm, (%)
Proportion of women using the traditional contraceptive method of rhythm, also known as periodic abstinence or the calendar method, among those of reproductive age (15-49 years) who are married or in union.

Withdrawal, (%)
Proportion of women using the traditional contraceptive method of withdrawal among those of reproductive age (15-49 years) who are married or in union.

Other traditional method, (%)
Proportion of women using other traditional contraceptive methods among those of reproductive age (15-49 years) who are married or in union. Other traditional methods include prolonged abstinence, breastfeeding, douching, various folk methods and traditional methods not reported separately.

Data Sources
United Nations, Department of Economic and Social Affairs, Population Division (2011). World Contraceptive Use 2010 (POP/DB/CP/Rev2010)
(http://www.un.org/esa/population/publications/wcu2010/Main.html)

Methods of estimation
Empirical data derived from surveys collected in 1985 or later based on nationally representative samples of women of reproductive age. For country estimates, the most recent data came from the United Nations Population Division based on survey data. Weights used are the estimated numbers of women aged 15-49 who are married or in a consensual union in 2007.

The number of women of reproductive age who are married or in a consensual union was estimated based on data on the proportion of women married or in union in each country containined in World Marriage Data 2006 and on estimates of the number fo women by age group obtained from World Population Prospects: The 2006 Revision.

Disaggregation
Sex (prevalence of sterilization)

Comments
None

8 HPV Preventive strategies

8.1 Cervical cancer screening practices

Cervical cancer screening, recommended age for screening, screening interval, estimated screening coverage, screening tests

Definitions

Pap smear
Cervical cancer screening is a public health intervention used on a population at risk or target population. A Papanicolau (or Pap) smear is a cervical screening test used to detect premalignant and malignant (cancerous) processes in the ectocervix. A medical professional uses a swab or stick to wipe cells off from the cervix, the opening lining of the womb (uterus) and these cells are then evaluated to determine presence or absence of abnormalities. Screening is not undertaken to diagnose cervical cancer disease, but to identify individuals with a high probability of having or developing cervical cancer (by detecting precancerous changes in the cervix uteri, which untreated, may lead to cancer). Histological diagnosis is the "gold standard" for identifying precancerous and cancerous lesions.

Screening interval (years) or frequency of screens
The recommended interval between one screening test and the subsequent test when the result is negative for abnomalities. Recommendations may vary between organizations and guidelines, so a range of the screening interval is recorded in some instances.

Lifetime number of recommended smears
Proportion of women in the target age group who are screened at the recommended age intervals during a given time period. The number of screening tests performed is not considered coverage, since this number may include women outside the target group, and women may be screened more often than recommended.

Number of women
Number of women in the sample who have been asked about their Pap smear history.

Age range
Age interval of the sample of women who received a Pap smear ranging form the youngest to the oldest woman.

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

Populations studied

General female population
Sample of women representative of the general population of the specific country and the specific age range. The information is generally collected directly from households through national censuses, or more commonly through household surveys. The latter may be collected as part of a broader national survey or may be focused only on health topics.

National screening programme
Women of a determined age range are invited (actively or not) to attend the screening programme throughout the whole nation or country. National guidelines specify who are at risk of cervical cancer and eligible to attend the programme. Eligible women may attend regularly within the specified interval. Different screening intervals may apply depending on age. This sample of women is based on information extracted from the registry data and it generally addresses women of reproductive age.

Regional screening programme
Women attending a screening programme in a specific region or city. The sample may not represent women from the whole country.

Women attending health services
Women visiting health care facilities: primary health care centres, antenatal clinics, sexually transmitted infections clinics, family planning clinics, gynaecology/obstetrics wards or hospitals for any reason who receive a Pap smear. This sample of women may be more health conscious or wealthy than the general population, thus classified separately to avoid selection bias as they may not be representative of the whole female population. More information on the sample may be included in the comments section.

Selected sample
Group of women with specific attributes that have been asked regarding their last Pap smear. See description of sample in the comments section.

Health care personnel
Sample of female health care attendants asked for their level of utilization of Pap smears to provide an insight into the general knowledge and awareness of the community. Health care providers may play a significant role in dissemination of medical information in the community, and increase the utilization of cytology services if aware of the benefits of screening.

National or regional coverage
National coverage presents data representative of the majority of women in the mentioned country. Regional data applies to the screening coverage representative of the majority of women in the mentioned region or city.

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

Ronco G, van Ballegooijen M, Becker N, Chil A, Fender M, Giubilato P, et al. Process performance of cervical screening programmes in Europe. Eur. J. Cancer. 2009 Oct;45(15):2659-2670.

Country-specific references identified in each country-specific report as general recommendation from relevant scientific organizations and/or publications.

Disaggregation
When available, data are disaggregated by rural or urban; by region when available; by type of population (general population, national screening programme, or other).

Comments
A summary of facts and figures are reported from the data sources of cervical cancer screening in the defined country, which is complementary to the other data presented, providing a screening profile within their health system setting and an overview of each country's cervical cancer situation. Data may be contradictory for the same country in some instances but it reflects the available literature of the different sources.

For additional data that may aid in the understanding of the presented values, refer to the original references for the population studied.

8.2 HPV vaccine licensure

Definition
HPV vaccine licensure status for the bivalent vaccine (Cervarix) and the quadrivalent vaccine (Gardasil)

Data Sources
Bivalent: GlaxoSmithKline Biologicals, Rixensart, Belgium, March 2009.

Quadrivalent: Merck & Co., Inc., Whitehouse Station, NJ, USA, March 2009.

PATH, January 2011 [accessed on 2009].

Methods of estimation
N/A

Disaggregation
None

Comments
None

8.3 HPV Vaccine introduction

Definitions

Vaccine in schedule
Whether or not the HPV vaccine is introduced as part of the vaccination schedule in the country and the schedule of the three-dose vaccine.

Introduction in entire/part of the country
Year of introduction of the HPV vaccine in the entire or part of the country.

Data Sources

WHO-UNICEF Joint Reporting Form and WHO Regional Offices. Immunization surveillance, assessment and monitoring. Immunization, Vaccines and Biologicals (IVB), World Health Organization. http://www.who.int/immunization_monitoring/data/en

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

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

VENICE2. Finalised report on the decision making process, modalities of implementation and current country status for the introduction of human papilloma virus and rotavirus vaccination into national immunisation programmes in Europe. December 2010 | Dorleans F, Giambi C, Dematte L, Cotter S, Stefanoff P, Mereckiene J, et al.

The current state of introduction of human papillomavirus vaccination into national immunisation schedules in Europe: first results of the VENICE2 2010 survey. Euro Surveill. 2010 ;15(47) | European Centre for Disease Prevention and Control. Introduction of HPV vaccines in EU countries - an update. Stockholm: ECDC; 2012 (Available at: http://ecdc.europa.eu/en/publications/Publications/Forms/ECDC_DispForm.aspx?ID=952)

Methods of estimation

WHO and UNICEF collect information on new vaccines introduction.

Disaggregation

None

Comments

None

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

Definitions

Finance mechanism
Financial mechanism used for HPV vaccine introduction.

Delivery strategy
HPV delivery strategy.

Integration of vaccination and cervical cancer screening program

Announcement date and type and recommendation committee
Country-specific date and type of recommendation made for the HPV vaccine.

Recommendation for primary target population
Primary target ages for HPV vaccination.

Recommendation for catch-up population
Whether or not there is a program for catch-up vaccination for those not included in the primary target population.

Recommendation for vaccinating males
Whether or not there is a recommendation for HPV vaccination in males.

Data Sources

Koulova A, Tsui J, Irwin K, Van Damme P, Biellik R, Aguado MT. Country recommendations on the inclusion of HPV vaccines in national immunization programmes among high-income countries, June 2006-January 2008. Vaccine 2008; 26 (51):6529-41.

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

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

VENICE2. Finalised report on the decision making process, modalities of implementation and current country status for the introduction of human papilloma virus and rotavirus vaccination into national immunisation programmes in Europe. December 2010 | Dorleans F, Giambi C, Dematte L, Cotter S, Stefanoff P, Mereckiene J, et al.

The current state of introduction of human papillomavirus vaccination into national immunisation schedules in Europe: first results of the VENICE2 2010 survey. Euro Surveill. 2010 ;15(47) | European Centre for Disease Prevention and Control. Introduction of HPV vaccines in EU countries - an update.

Stockholm: ECDC; 2012 (Available at: http://ecdc.europa.eu/en/publications/Publications/Forms/ECDC_DispForm.aspx?ID=952)

Methods of estimation
WHO and UNICEF collect information on new vaccines introduction.

Disaggregation
N/A

Comments
None

9 Protective factors for cervical cancer

9.1 Male circumcision

Definitions

Circumcision
Surgical removal of the foreskin on the penis or prepuce.

Prevalence of circumcision
The prevalence of circumcision (or circumcision rate) refers to the proportion of males that are circumcised in a given population. It may also refer to the proportion of newborn males that are circumcised.

Data Sources

Estimates are derived from country-specific published literature. Refer to country report for specific references. The main data sources are:

Williams BG, Lloyd-Smith JO, Gouws E, Hankins C, Getz WM, Hargrove J, de Zoysa I, Dye C, Auvert B. The potential impact of male circumcision on HIV in Sub-Saharan Africa. PLoS Med. 2006;3(7):e262.

Drain PK, Halperin DT, Hughes JP, Klausner JD, Bailey RC. Male circumcision, religion, and infectious diseases: an ecologic analysis of 118 developing countries. BMC Infect Dis. 2006 Nov 30;6:172.

World Health Organization, Department of Reproductive Health and Research and Joint United Nations Programme on HIV/AIDS (UNAIDS). Male circumcision: global trends and determinants of prevalence, safety and acceptability. 2007. Available from: http://www.who.int/reproductivehealth/publications/rtis/9789241596169/en.

Methods of estimation

Refer to country-specific reference(s) in the country-specific report for full methodologies.

Disaggregation

N/A

Comments

None

9.2 Condom use

Refer to Condom use (7.4) in the Reproductive Health section of the indicator guidelines for definition, source and methods of estimation.

10 Demographic and socioeconomic factors

10.1 Population, population annual growth rate, populations in urban areas

Definitions

Median age (years)
Median age of the population.

Total Population
Population estimates include all residents regardless of legal status or citizenship.

Population growth rate (%)
The exponential change in the total population for the period 1996-2006.

Population in urban areas (%)
Percentage of the population living in urban areas.

Data Sources

United Nations, Department of Economic and Social Affairs, Population Division (2013). World Population Prospects: The 2012 Revision, CD-ROM Edition. Available at: http://esa.un.org/wpp/unpp/panel_population.htm

Methods of estimation

World Bank staff estimates are derived from civil registration, population registers, other administrative records, population and censuses, social and demographic surveys.

Disaggregation

Age and sex

Comments

None

10.2 Crude Birth rate / Death rate

Definition
The average annual number of births per 1000 population at mid-year, also known as the crude birth rate.

The average annual number of deaths per 1000 population at mid-year, also known as the crude death rate.

Data Sources
World Bank's Health, Nutrition and Population data (http://devdata.worldbank.org/hnpstats)

United Nations, Department of Economic and Social Affairs, Population Division (2013). World Population Prospects: The 2012 Revision, CD-ROM Edition. Available at: http://esa.un.org/wpp/unpp/panel_population.htm

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

Disaggregation
None

Comments
None

10.3 Life expectancy at birth

Definition
Average number of years that a newborn is expected to live according to a current mortality table.

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

Methods of estimation
Estimates were calculated from developed model life tables based on vital registration, census and surveys. Age-specific mortality rates were required to compute life expectancy at birth. If inadequate data exist on age-specific mortality rates, the life tables were derived from estimated under-5 mortality rates and adult mortality rates.

Disaggregation
Sex

Comments
Modelling based on data from other populations was applied to low income countries that lacked data to estimate life expectancy.

10.4 Adult mortality rate

Definition
Probability that an adult (15+ years) will die before reaching his/her 60th birthday per 1000 population.

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

Methods of estimation
Empirical data from civil or sample registration, census or surveys are aggregated to estimate the level and trend of adult mortality. If inadequate data exist for age-specific mortality, the life table is derived from estimated under-5 mortality rates and adult mortality rates.

Methods for estimating adult mortality. United Nations Population Division, July 2002 (ESA/P/WP.175). (http://www.un.org/esa/population/publications/adultmort/Complete.pdf)

Disaggregation
Sex

Comments
There is scarce data on adult mortality, especially in low income countries. Estimates for adult mortality come from retrospective censues and surveys that may be subject to measurement error.

10.5 Under 5-mortality rate / Infant mortality rate

Definition
Under 5-mortality rate is the probability of a child dying before reaching the age of five, according to age-specific mortality rates of that period.

Infant mortality rate is the probability of a child born in a specific year or period dying before reaching the age of one, according to age-specific mortality rates of that period.

Both probabilities are expressed as a rate per 1000 live births.

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

Methods of estimation
Empirical data from civil or sample registration, census or surveys are aggregated to estimate the level and trend of under-five mortality. If inadequate data exist for age-specific mortality, the life table is derived from estimated under-5 mortality rates and adult mortality rates.

Methods for estimating adult mortality. United Nations Population Division, July 2002 (ESA/P/WP.175). (http://www.un.org/esa/population/publications/adultmort/Complete.pdf)

Disaggregation
Sex (for under 5-mortality)

Comments
Please note that there is substantial variation in data quality and consistency in terms of completeness of information across countries. Infant mortality rates from surveys are prone to recall bias, so estimates are derived from under-five mortality, which leads to a supplementary step to estimate infant mortality rates.

10.6 Maternal mortality rate

Definition
Number of maternal deaths per 100 000 live births during a specified time period.

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

Methods of estimation
Estimates are derived from censuses or surveys, health services records, reproductive-age mortality studies (RAMOS), or household surveys. For countries with inadequate maternal mortality data, statistical models are applied. A regression model is used to estimate global and regional maternal mortality estimates every five years.

Maternal Mortality Estimates developed by WHO, UNICEF and UNFPA. Geneva, World Health Organization, 2000. (http://www.who.int/reproductive-health/publications/maternal_mortality_2000/index.html)

Disaggregation
None

Comments
Maternal deaths are rare events, which make estimates prone to measurement errors. There are no data or scarce data for low-income countries and modelling is used to obtain a national estimate.

10.7 Neonatal mortality rate

Definition
Number of deaths during the first 28 complete days of life per 1000 live births per year.

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

Methods of estimation
Empirical data from vital registration and household surveys are used to estimate neonatal mortality rates. If no survey or registration data is available, rates are estimated from under 5-mortality using a regression adjusted for AIDS.

Disaggregation
None

Comments
Estimates depend on the accuracy and completeness of reporting and recording of births and deaths, which are prone to underreporting and misclassification, especially for deaths occurring in early life.

10.8 Gross national income (GNI), per capita

Definition
Gross national product is gross domestic product (GDP) plus net income (employee compensation and investment income) from abroad.

Data Sources
World Development Indicators Database, 2013. Washington, DC, World Bank. Available at: http://databank.worldbank.org/data/download/GNI.pdf [Accessed on July 2013]

Methods of estimation
GNI, per capita is GNI divided by mid-year population. Purchasing power parity (PPP) is GNI converted to international dollars. An international dollar has the same purchasing power over GNI.

Disaggregation
None

Comments
None

10.9 Population living below the poverty line (% with <$1 day)

Definition
Proportion of the population living below the poverty of less than $1 per day. The $1 per day standard, measured in 1985 international prices and adjusted to local currency using purchasing power parities (PPP), was chosen for the World Bank's World Development Report 1990: Poverty because it is typical of the poverty lines in low-income countries. This international poverty line tries to hold real value of the poverty line constant across countries for comparison.

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

Methods of estimation
The World Bank's Development Research Group estimates the number of people living below various international poverty lines, taking into account any biases or inequality measures from the data. Data are updated annually as new survey data become available and major reassessment of the estimates are make every three years.

Disaggregation
None

Comments
PPP exchange rates are used to account for the local prices of goods and services not traded internationally. PPP is used to compare across national accounts, not for making international poverty comparisons, so the international poverty line measure should be interpreted carefully as it may not measure the same degree of need or deprivation across countries.

10.10 Expenditure on Health

Definitions

Total expenditure on health as percentage of GDP
Total expenditure on health as percentage of gross domestic product (GDP).
GDP is the value of all goods and services provided in a country by residents and non-residents

General government expenditure on health as % of total government expenditure
Percentage of total government expenditure spent on health.

Per capita total expenditure on health at international dollar rate
Per capita total expenditure on health at international dollar rate

General government expenditure on health as % of total expenditure on health
Total health expenditure (THE) as a percentage of the gross domestic product, and per capita health expenditures in international dollars.

Private expenditure on health as % total expenditure on health
Percentage of total health expenditure distributed to private sectors in financing health.

Per capita government expenditure on health at international dollar rate
Per capita government expenditure on health at international dollar rate

Data Sources

The World Health Report 2008: working together for health. Geneva, World Health Organization, 2008. (http://www.who.int/whr/2008/en)

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

Methods of estimation

Estimates are derived from full national health accounts or report expenditure on health from government finance statistics and international financial statistics aggregated from various sources into the National Health Accounts databases within the World Health Organization (http://www.who.int/nha)

Sources: OECD, International Monetary Fund, government finance statistics and international financial statistics, United Nations National accounts statistics and national sources (national health accounts reports, public expenditure reports, statistical yearbooks and other periodical s, budgetary documents, national accounts reports, central bank reports, nongovernmental organization reports, academic studies, reports and data provided by central statistical offices and ministries and statistical data on official web site.

Disaggregation

None

Comments

Calculations may be underestimated when it is not possible to obtain local government, nongovernmental organizations and insurance expenditures data.

10.11 Physicians per 1000

Definition
Number of physicians which includes generalists and specialists per 1000 population.

Data Sources
WHO Global Health Workforce Statistics [online database]. Geneva, World Health Organization, 2013. Available at: http://www.who.int/hrh/statistics/hwfstats [Accessed on July 2013]

Methods of estimation
No methods of estimation have been developed. Numbers are based on data compiled from four major survey sources: established surveys, household and labour force surveys, population and housing censuses and records from professional and administrative source.

Disaggregation
Number and density of physicians (per 1000 population)

Comments
None

10.12 Adult literacy rate / Youth literacy rate

Definition
Literacy rate is the percentage of population ages >15 years for adults and 15-24 years for youth who can both read and write with understanding a short simple statement on his/her everyday life.

Data Sources
UNESCO Institute for Statistics Data Centre [online database]. Montreal, UNESCO Institute for Statistics, 2013. Available at: http://stats.uis.unesco.org [Accessed on July 2013]

Methods of estimation
The number of literates are divided by the corresponding age-group population and multiplied by 100. Numbers are derived from national population census, household and/or labour force surveys.

Disaggregation
Sex

Comments
None

10.13 Net enrolment ratio, primary level / Net enrolment ratio, secondary level

Definition
Net enrolment ratio for primary/ secondary level is the ratio of the number of children of official school age (as defined by the national education system) who are enrolled in primary school to the total population of children of official school age.

Data Sources
UNESCO Institute for Statistics Data Centre [online database]. Montreal, UNESCO Institute for Statistics, 2013. Available at: http://stats.uis.unesco.org [Accessed on July 2013]

Methods of estimation
Estimates are derived from school register, school survey or census for data on enrolment by age. Population censuses or estimates for school-age population normally obtained from the Central Statistical Office.

Disaggregation
Sex

Comments
None

11 Immunization

Definitions

Immunization coverage estimates
Immunization coverage estimates are reported for diphtheria, tetanus, and pertussis (DTP3), hepatitis B, measles, and polio.

Vaccine schedule
Immunisation schedules for each country are reported.

Immunisation system indicators
A select few Indicators regarding planning and management, system performance, surveillance, safety, finance and new vaccines introduction are reported.

Data Sources
Annual WHO/UNICEF Joint Reporting Form and WHO Regional offices reports (Update of 2013/July/13). Geneva, Immunization, Vaccines and Biologicals (IVB),World Health Organization (http://www.who.int/immunization_monitoring/data/data_subject/en/index.html)

Methods of estimation
Immunization coverage estimates are derived from collected coverage data (administrative or survey data) from countries, which WHO and UNICEF uses to estimate coverage with consideration of potential biases and contributions from local experts.

National immunization schedules are reported. Schedules vary by country and depend primarily on the local epidemiology of the vaccine-preventable disease and the ability to finance the vaccine.

WHO and UNICEF collect information on planning and management, system performance, surveillance, policy, safety, finance, and new vaccines introduction.

Disaggregation
N/A

Comments
None