

## Estimating of the number of cancer cases attributed to HPV infections for Poland in 2015

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**Introduction.** Human papillomavirus (HPV) is responsible for almost all cervical cancers, for an important fraction of other anogenital cancers (anus, vulva, vagina and penis), but also for some head and neck cancer cases.

**Material and method.** Data on cancer incidence for Poland in 2015 were taken from the database of Polish National Cancer Registry (<http://onkologia.org.pl>). Attributable fractions (AFs) for all HPV-associated cancer sites were derived from published study. The number of cancer cases attributable to HPV infections was calculated by multiplying the number of registered new cancer cases by the given AF for all HPV-associated cancer sites.

**Results.** Of all newly registered cancer cases for Poland in the analysed year, 4080 were estimated to be attributable to HPV infections. The vast majority of these cases — 3300, were diagnosed in women, 780 in men. Cancer cases attributed to HPV represent 44% of all cancers related to HPV and 2.5% of all malignant neoplasms registered in Poland in 2015.

**Conclusions.** The fraction of cancers attributable to HPV infections is highly dominated by cervical cancer. Effective control of this cancer site should combine increasing awareness of threats related to HPV infections, improving access to HPV vaccination (primary prevention) by introduction of financing from public funds, and increasing access to secondary prevention in both forms — cytological and HPV testing. Introduction of an HPV vaccination population program in Poland should be a priority in strategy of cancer control.

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**Key words:** HPV, human papillomavirus, cancer, Poland, attributable fraction, primary and secondary prevention, HPV vaccine

### Introduction

Human papillomavirus (HPV) is responsible for almost all cervical cancers, for an important fraction of other anogenital cancers (anus, vulva, vagina and penis), but also for some head and neck cancer cases. In 2012 4.5% of all cancers worldwide were attributed to HPV (8.6% in women and 0.8% in men) [1]. These cancers can be effectively eliminated by known primary and secondary prevention methods.

### Objective

The aim of this publication is to estimate the number of cancer cases attributed to HPV infections for Poland in

2015. It also draws attention to the fact that it is a significant public health problem.

### Material and method

Data on cancer incidence for Poland in 2015 were taken from the database of Polish National Cancer Registry (<http://onkologia.org.pl>). Attributable fractions (AFs) for all HPV-associated cancer sites (cervix uteri, other anogenital sites: anus, vulva, vagina, penis, and head and neck cancer: oropharynx, oral cavity and larynx) were derived from a study published in 2016, prepared by M. Plummer and others [2]. For vulvar cancer we used AFs specific for the age. For

oropharyngeal cancer, AF calculated for East Europe was taken for analyses.

The number of cancer cases attributable to HPV infections was calculated by multiplying the number of registered new cancer cases by the given AF for all HPV-associated cancer sites.

## Results

In 2015 over 160 000 new malignant neoplasms cases were noted in Poland (according to International Classification of Diseases, 10<sup>th</sup> Revision (ICD-10) codes: C00–C97) of which 80 867 among men and 79 230 among women. HPV-associated cancer sites constituted 4473 and 4761 cases respectively.

Of all newly registered cancer cases for Poland in the analysed year, 4080 were estimated to be attributable to HPV infections (Tab. I). The vast majority of these cases — 3300, were diagnosed in women, 780 in men. Cancer cases attributed to HPV represent 44% of all cancers related to HPV and 2.5% of all malignant neoplasms registered in Poland in 2015.

For women, the large majority of total number of cancer attributable to HPV was contributed by cervical cancer (2723), followed by anus (201), oropharynx (140), vulva (119), vagina (81), oral cavity (21) and larynx cancer (16). These cancer cases together constitute 69% of the total number of cancer associated with HPV and 4.2% off all registered cancer cases for women.

Among men, the biggest contribution was for oropharynx (418), smaller for penis (124), larynx (100), anus (90) and oral cavity (48). Cases attributable to HPV constitute 17% of cancer related to HPV and 1.0% of all cancers occurring in Poland in 2015 for men.

## Discussion and conclusions

The obtained results for Poland for 2015 are similar to the results for the whole Europe presented in the paper prepared by de Martel C et al. [1], where also 2.5% of all cancer were attributed to HPV, 4.4% in women and 0.9% in men.

The fraction of cancers attributable to HPV infections is highly dominated by cervical cancer, which constituted 2/3 of the total number of cancers attributable to HPV in Poland in 2015 and 83% of all cancers attributable to HPV for women.

Cervical cancer is one of the most preventable cancers. Effective control of this cancer site should combine increasing awareness of threats related to HPV infection, improving access to HPV vaccination (primary prevention) by introduction of financing from public funds, and increasing access to secondary prevention in the form of HPV testing and cytological tests. These may lead in the future to the significant morbidity and mortality reduction of HPV-associated cancer in Poland. The Nordic countries' example proves that effective implementation of preventive health strategies leads to excellent results. In these countries cervi-

**Table I.** Number of HPV-associated and HPV-attributable cancer cases in Poland in 2015

Cancer site (ICD-10 code)	Sex	Number of HPV-associated cancer cases	AF	Number of HPV-attributable cancer cases
Cervix (C53)	Female	2723	100%	2723
Vulva (C51)	Female	581	Age 15–54 years: 48% Age 55–64 years: 28% Age 65+ years: 15%	119
Vagina (C52)	Female	104	78%	81
Penis (C60)	Male	243	51%	124
Anus (C21)	Female	228	88%	201
	Male	102		90
Oropharynx (C01, C09–C10)	Female	279	50%	140
	Male	836		418
Oral cavity (C02–C06)	Female	491	4.3%	21
	Male	1121		48
Larynx (C32)	Female	355	4.6%	16
	Male	2171		100
TOTAL	Both sexes	9234	44%	4080
	Female	4761	69%	3300
	Male	4473	17%	780

cal cancer mortality has decreased for many years and now it is a marginal problem [3].

Although vaccination against HPV is considered to be the most effective strategy to reduce mortality from cervical cancer and other cancers associated with HPV infections [1], Pap test is still the basic method of prophylaxis in Poland. Introduction of a population program of HPV vaccination in Poland should be a priority in strategy of cancer control.

### Abbreviations

HPV — Human papillomavirus

AF — Attributable fraction

ICD — International Classification of Diseases

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