

## **Incidence of external genital lesions (EGL) caused by human papillomaviruses in the Czech population**

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### *Abstract*

*Genital warts (condyloma acuminata) caused up to 90% cases by two human papillomaviruses of type 6 and 11 are not life-threatening diseases but can cause not only clinical symptoms (burning, itching, bleeding, and pain) but also psychosocial stress, embarrassment, and anxiety making for impaired quality of life. The aim of this cross-sectional study was to determine the prevalence and incidence rate of genital warts using questionnaire survey in the Czech population and to assess the risk predictors of genital warts.*

*Between January 2013 and March 2014 valid data were collected from 33,700 attendees at 268 outpatient clinics in all 14 regions of the Czech Republic. The questionnaire enquired on several lifestyle factors, including residence, education, smoking, number of lifetime sexual partners, and HPV immunization status, as well as date of birth and gender. Information on genital warts was obtained with the question, ‘Have you ever had genital warts?’. Study participants were also asked for the year of their first outbreak of genital warts and of recurrent episodes if any occurred, the treatments received, and the genital warts status of their sexual partner. The questionnaire also contained six illustrative pictures representing three different types of genital warts for men and women. Associations between the various lifestyle factors and genital warts were examined using univariate methods and multiple logistic regression, from which odds ratios (ORs) and the corresponding 95% CIs were estimated.*

*The lifetime prevalence of self-reported genital warts was independent of gender, with rates of 5.7% (5.2–6.3%) for men and 6.0% (5.7–6.3%) for women. Of the participants with clinically diagnosed genital warts, 76.2% (74.3–78.1%) reported having required treatment with topical cytotoxic agents and/or ablative techniques, while 22.7% (20.9–24.6%) claimed that the pathology disappeared without medical assistance. The yearly incidence rate between the years 2010 and 2013 was 496 (456–538) per 100,000 inhabitants.*

*A sexual partner with genital warts was identified as the strongest risk factor for the acquisition of infection. The percentage of subjects reporting genital warts in both members of the couple was 87.6% (83.2–91.3%), and the mutually adjusted odds ratio, independent of gender, achieved 114.3 (78.9–165.4) when compared to participants whose sexual partners had never had the infection. The risk of infection was found to increase with the number of partners, in the age of 21–30 years, with smoking more than 10 cigarettes a day, and living in an urban area.*

*Although only 0.6% (0.5–0.7%) of all individuals reported recurrent disease, the percentage in the affected group increased to 9.5% (8.2–10.9). It was also found that the risk of recurrence was higher than that of a first infection (age-adjusted odds ratio 1.6, 1.4–1.9),*

*Immunization with the quadrivalent HPV vaccine substantially decreased the prevalence of genital warts by 91.2% (81.8–96.7%) when compared to the unvaccinated women. Recurrent genital warts prevalences of 1.1% (0.0–5.9) and 10.9% (9.1–12.9) in immunised and unimmunised women with prior genital warts history, respectively, resulted in a vaccine effectiveness of 65.4% (3.4–87.6%). The notably strong protective effect of 4HPV immunisation in women who had a sexual partner with genital warts was demonstrated by a very high protection of 98.8% (93.0–99.8%) in contrast to unimmunised women. This is the first representative study of genital warts in the general population of the Czech Republic. It was the first study that revealed almost 23% of infected did not require treatment for genital warts, most likely because they were not aware of the infection. For the first time these results quantified the risk rate of genital warts acquisition in couple where one partner has had genital warts. The overall protective impact of the quadrivalent HPV vaccine was demonstrated with population data. To lower the chance of genital warts acquisition in the general population and in populations at increased risk, only current quadrivalent or incoming nonavalent HPV vaccination should be recommended to provide effective protection.*