



Central European  
Digital Media  
Observatory



**Don't believe everything you read on  
the internet. The HPV Vaccination  
really protects!**

**Coffee Beans**

**Prof. RNDr. Vanda Boštíková, Ph.D., Prof. RNDr.  
Aleš Macela, DrSc**

Human papillomaviruses are currently the most common sexually transmitted infection. Certain strains of human papillomavirus (HPV) are responsible for more than 90% of cervical cancers, 70% of vaginal and vulvar cancers and 60% of penis and oropharyngeal cancers. Cervical cancer is the second most common cancer in women under the age of 45 worldwide. More than 85% of cases are currently reported from developing countries. HPV vaccines represent a major advance in the prevention of these diseases (1).

Unfortunately, the safety and effectiveness of vaccines in general, as well as HPV vaccines in particular, have become the target of many misinformation attacks and social media campaigns. In the first place, the popular social media platform Instagram is being abused in this regard, and is a major source of medical misinformation. The platform X (formerly known as Twitter) is falling closely behind. In the United States alone, these platforms are used by more than 65% of adults aged 30-49 years, which corresponds to a key demographic of parents likely to have children eligible for the HPV vaccine (9-14 years) (1). The safety as well as the efficacy of currently available vaccines is most often challenged here. In the Czech Republic, an effective HPV vaccine has been available since 2006.

There is very poor awareness of vaccination against this disease in our population, again associated with a great deal of misinformation. As HPV vaccination is not compulsory, coverage of the vaccine is woefully low, despite the fact that the vaccine has the potential to protect against malignant neoplasia. The most common myths in the Czech environment about HPV vaccines are, for example, that:

- ... the HPV vaccine has not been shown to prevent cervical cancer;
- ... cervical smears are sufficient to prevent cervical cancer;
- ... vaccines are not safe and have not been adequately tested;
- ... vaccines are unnecessary because in most people the immune system can cope with the disease and the disease doesn't break out;
- ... the recommended age for vaccination is too low.

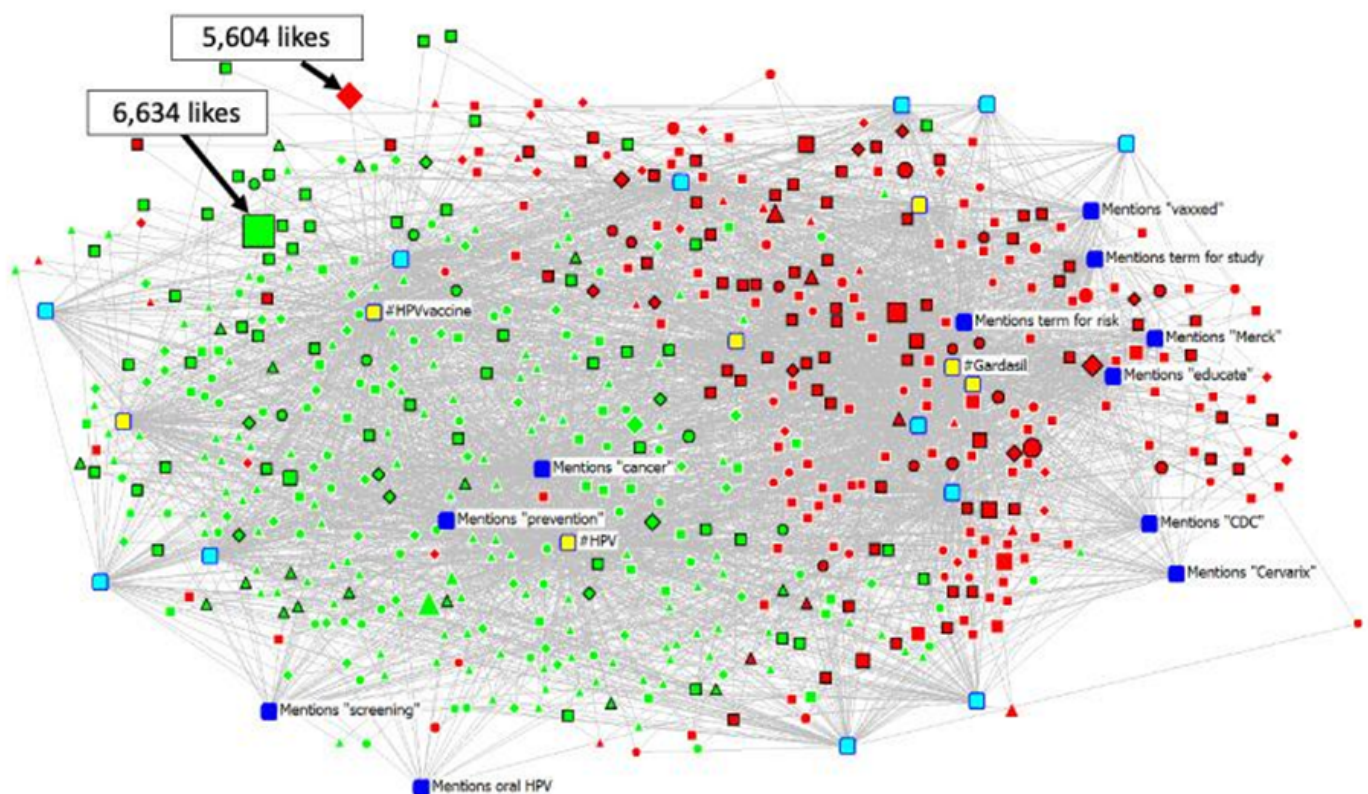
Health misinformation on social media is very diverse, often with strong emotional undertones. Anti-vaccine groups spread misinformation without presenting evidence, use fictional case studies to emotionally affect the public, and spread distrust of information from health professionals and official sources, often referring to the economic benefits of drugs or vaccines for manufacturers (Figures 1 and 2).

The analysis conducted using Netlytic software looked at publicly available English-language Instagram posts collected during April to December 2018. Totally 16 607 texts containing the hashtags #HPV, #HPVaccine or #Gardasil were selected. Content analysis of the relevant posts revealed several levels of misinformation, mostly centred on claims about vaccines' dysfunction, dangers and complications after vaccination (2).

This misinformation is a major threat to public health and to medicine in general. Tackling

misinformation on social media requires a proactive approach. Including cultivating reading comprehension and critical thinking. Other recommendations on how the antivaccine movement can be countered include, but are not limited to, creating official social media accounts for health organisations, modifying the algorithm for finding official information from valid sources, displaying valid sources in the first place when searching and, most importantly, systematically educating people in finding valid sources.

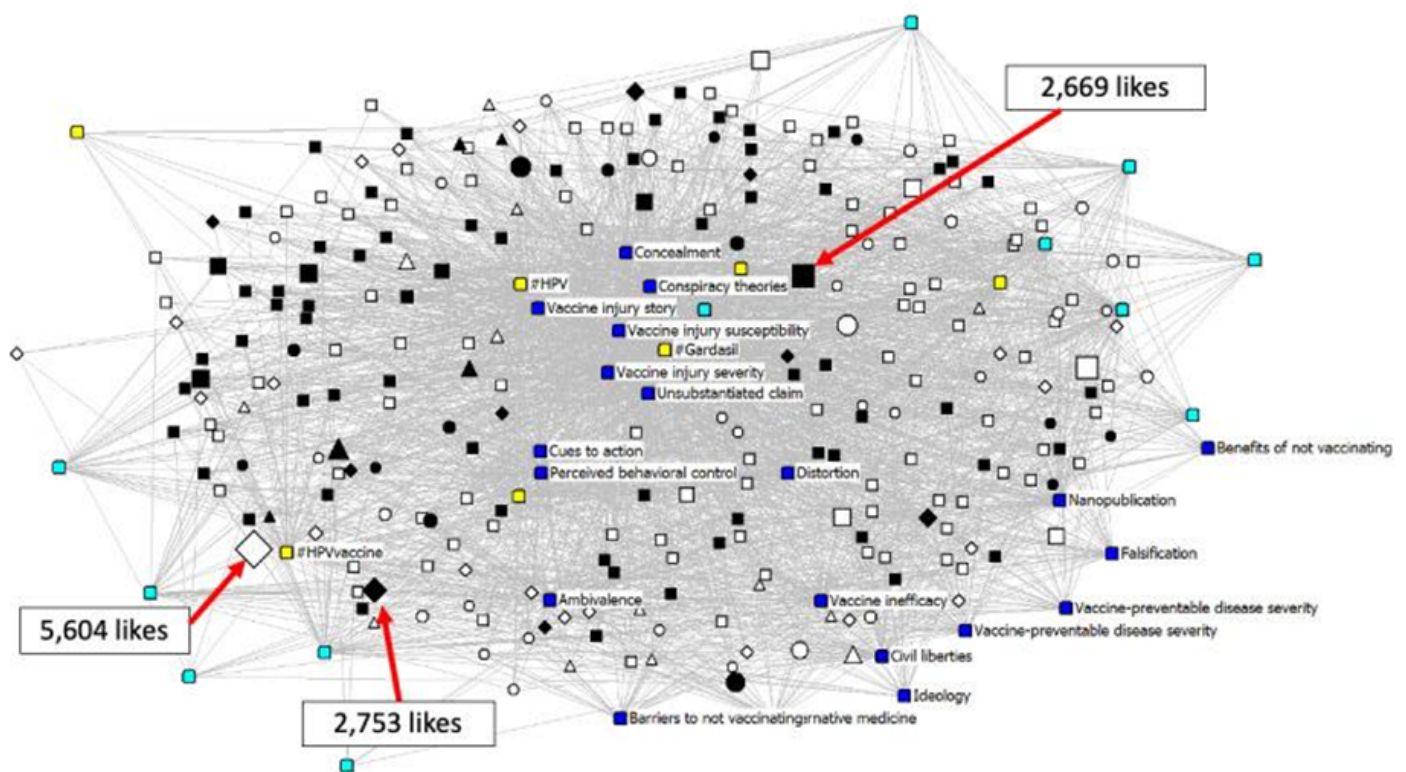
The ability to counter misinformation depends precisely on raising the level of health education. In Western universities and secondary schools, the curriculum is gradually expanding to develop students' ability to distinguish validly between information and misinformation. Within this framework, one of the basic strategies recommended is to use direct and concise explanations of facts when communicating with students, pairing scientific facts with stories or reinforcing positive attitudes towards vaccinations. Increasing the number of positive vaccine advertisements could also have a positive impact. In general, however, there is a need to try to increase respect for scientific work among the general public. Scientists themselves need to work on this.



**Figure 1:** Network analysis of a total of 580 social media posts containing the hashtags #Gardasil, #HPVvaccine, #HPV. The term #Gardasil was the center of antivaccine opinions focused on vaccine risks, while the hashtags #HPVvaccine and #HPV were the center of much more numerous pro-vaccine posts focused on cancer prevention issues. Antivaccine posts contained many more nodes with a black border, indicating that the post was a personal narrative as opposed to information/sources with a white border (see explanatory notes). The size of the posts was proportional to the number of

'likes' received - the most 'liked' post (6634 likes) was a positive personal narrative post created by a non-healthcare professional.

**Explanatory notes:** circle - post was written by a group of non-health professionals, square - post came from an individual outside the health profession, triangle - post from a group of health professionals, diamond - post from a health professional, an individual. The black edge of the node indicates a personal narrative, the white edge represents classically given embellished information. The red colour indicates antivaccine content of the contribution, the green colour indicates a positive attitude towards vaccination and vaccines. The light blue colour represents the source of the posts gathered from social media images, the dark blue colour draws data from the headlines and the yellow colour represents the social media elements. The size of the nodes depends on the number of posts.



**Figure 2:** Visualization of the anti-vaccination network based on the analysis of a total of 256 posts. At the centre of the network are information withholding, unsubstantiated claims and stories of harm to the human body from vaccines. While misrepresentation, falsification and ambivalence stand more on the periphery. Similarly, posts touching on conspiracy theories and vaccine ineffectiveness stood at the center of the network, while posts on debates about vaccination, ideology, alternative medicine, and civil liberties remained on the periphery. Social media elements (in yellow), such as the use of hashtags, links and mentions of other users, were also at the centre of the network. Posts with information/sources (white) clustered around domains of misinformation, including falsification, while posts with personal narratives (black) clustered around various domains of misinformation, including concealment and conspiracy theories. The color and shape codes are identical to Figure 1 (3).

## References:

1. Briani P., et al.: Review of HPV-related diseases and cancers. *New Microbiol.* 2017;40(2):80-85
2. Kearey M.D., et al.: Characterizing HPV vacciner sentiments and content on Instagram. *Health Edu Behavior.* 2021; 46, 2S
3. Massey, PM et al.: Dimensions of Misinformation About the HPV Vaccine on Instagram: Content and Network Analysis of Social Media Characteristics, *J Med Internet Res.* 2020 Dec; 22(12): e21451)