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## Original Research

# Cervical cancer, human papillomavirus and vaccines: assessment of the information retrieved from general knowledge websites in Chile



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## ABSTRACT

**Objectives:** Cervical cancer is the most common gynaecologic malignancy worldwide and is the sixth cause of cancer death in Chile. Human papillomavirus (HPV) is responsible for most cervical cancers. Individuals seeking basic information about HPV frequently turn to health information websites. We hypothesized that some of their data may be inaccurate.

**Study design:** Comparative analysis of information.

**Methods:** We analyze the content of highly accessed websites such as the Spanish version of Wikipedia and Yahoo Answers through the application of a questionnaire, as well as a website managed by the Chilean Ministry of Health (Minsal). The accuracy of each answer was confirmed by comparison with information retrieved from articles published by indexed journals.

**Results:** The information provided by the Spanish version of Wikipedia was accurate; nevertheless a few omissions were detected. The quality of the information provided by the Spanish version of Yahoo Answers was inaccurate and confusing. The Minsal website lacked important information on several topics about HPV even though it is managed and endorsed by the government.

**Conclusions:** We suggest periodical content reviews to increase the completeness, transparency and correctness of the website.

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## Introduction

Cervical cancer is the most common gynaecologic malignancy worldwide with an estimated 528,000 new cases for 2012 and

266,000 deaths worldwide.<sup>1</sup> In Chile, the mortality rate of cervical cancer is four times higher than that of developed countries, mainly affecting women of low socio-economic level.<sup>2</sup> Consequently, the Cervical Cancer Prevention Programme was established in 1987 to screen for cervical cancer by applying

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smear tests to women aged 25–64 years every 3 years.<sup>3</sup> In 2003 the programme was modified, so samples were collected for Papanicolaou, Human papillomavirus (HPV) DNA testing and naked-eye visual inspection of the cervix. Patients who were positive to these tests were referred for appropriate treatment. As a result, the mortality rate due to cervical cancer was reduced from 9.3% in 2000 to 5.8% in 2010. However, it is important to remember that women of low socio-economic level tend to lack biomedical knowledge and have difficulties in accessing health professionals. Therefore, the Internet has become a valuable source of healthcare information. As an example, 74.5% of the Chilean population had access to the Internet either by the use of a smartphone or computer by the end of 2015, removing social access to all-types of information.<sup>4</sup>

Currently, individuals are increasingly using the Internet to search health-related information.<sup>3</sup> A study reported that 82.5% of surveyed individuals used 'key words' with search engines, 33.7% visited general health-related websites and 12.5% accessed specific health information websites. Most surprising was the fact that 98.7% of these participants rated the information extracted from the Internet as understandable and 98.1% as trustworthy.<sup>4</sup> A latter study reported that 35% of the adults in the United States went online to establish what medical condition they might have, and 59% had searched online for health information during the previous year.<sup>5</sup> Already in 2009 it was reported that one of the prominent sources for general health information was Wikipedia, an open-access multilingual online encyclopaedia that receives contributions from its users, surpassing MedlinePlus and NHS Direct online.<sup>6</sup> Nowadays, patients count on the information from Wikipedia before visiting a healthcare professional.<sup>7</sup>

A study published in 2014 revealed a poor coverage of HPV information in other languages besides English.<sup>8</sup> Consequently, we questioned ourselves what information was available to the Chilean population in Spanish regarding the etiological agent responsible of nearly 96% of cervical cancer cases. Hence, we chose Wikipedia, Yahoo Answers and a website managed by the Chilean Ministry of Health (Minsal). The information provided by these websites was compared with scientific information obtained from specialized journals that were indexed by PubMed.

## Methods

In order to select the web pages to be analyzed, we performed an initial search on the website Alexa (March 11, 2015) (<http://www.alexa.com/topsites/countries/cl>) to establish the top 10 websites used by the Chilean population. As sources of general information we selected two websites: Wikipedia (ranked 10th) (<http://es.wikipedia.org>), a free-content virtual encyclopaedia, where information about any topic is loaded by anyone who wants to collaborate. The second website selected was Yahoo Answers (ranked 7th) (<http://espanol.answers.yahoo.com>), site maintained by an online community, and where questions of general interest are raised and answered. This website is also free to access.

We carried out bibliographic searches using PubMed (<http://www.ncbi.nlm.nih.gov/pubmed>) as this database is often utilized by researchers in health science due to its easy

accessibility and free access. The following search terms were used: 'HPV', 'human papillomavirus', 'HPV infection', 'HPV cervical cancer', 'HPV cancer epidemiology', 'cancer cervix', 'HPV vaccine' and 'HPV vaccine safety'. To ensure that the information was reliable, we used the following journals as sources: British Journal of Cancer, The Lancet, The Lancet Oncology, The Lancet Infectious Diseases, Cell, American Journal of Epidemiology, Journal of Virology, Journal of Clinical Pathology, Journal of the National Cancer Institute, Microbiology and Molecular Biology Reviews, The Journal of Clinical Investigation, Clinical Infectious Diseases, Advances in Cancer Research, Vaccine, New England Journal of Medicine and Gynecologic Oncology. The search was restricted for articles published within the preceding 5 years. In case the information extracted from these journals was conflicting, we compared it with data from the Center for Disease Control (CDC) and National Cancer Institute websites to resolve the situation.

The search terms were chosen in order to answer the following questionnaire:

1. What is the papillomavirus?
2. Who can get infected and how is HPV transmitted?
3. What are the health problems caused by HPV infection?
4. What vaccines against HPV are available to the community?
5. How do HPV vaccines work?
6. Who should be vaccinated against HPV?
7. What is the effectiveness and safety of HPV vaccines?

Additionally, Chilean users may access the Chilean Ministry of Health website (Minsal), from this website we downloaded a flyer that was designed to inform the Chilean population about HPV and HPV vaccination ([http://web.minsal.cl/sites/default/files/MANUAL\\_VPH\\_2015\\_final.pdf](http://web.minsal.cl/sites/default/files/MANUAL_VPH_2015_final.pdf)).

The Wikipedia website was accessed from April 7 to April 21, 2015, Yahoo Answers from April 17, 2015, to May 03, 2015, and the Minsal website from January 05, 2015, to January 21, 2016.

## Results

We studied the documents downloaded from PubMed and used them to compose an answer for each of the seven questions. The aim was to formulate answers that were simple and informative at the same time. Afterward, we accessed each of the different sources. For Wikipedia and Yahoo Answers, we typed the question in Spanish inside the query box of each website and analyzed the information that was provided by the website. In the case of the flyer from Minsal, we read the information provided on it. The feedback obtained from the three sources was compared to the answers compiled from the articles downloaded from PubMed and scored depending on its accuracy and reliability (Table 1).

### What is the papillomavirus?

To the first question, inquiring about the papillomavirus, all four sources agreed that HPV was the main etiologic agent of

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