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## Original Research

# Knowledge, attitudes and behaviors of the Italian population towards *Neisseria meningitidis*, *Streptococcus pneumoniae* and HPV diseases and vaccinations: A cross-sectional multicentre study



C. de Waure<sup>a,\*</sup>, G. Quaranta<sup>a</sup>, C. Ianuale<sup>a</sup>, D. Panatto<sup>b</sup>, D. Amicizia<sup>b</sup>, L. Apprato<sup>b</sup>, P. Campanella<sup>a</sup>, M. Colotto<sup>a</sup>, C. De Meo<sup>a</sup>, F. Di Nardo<sup>a</sup>, E.M. Frisicale<sup>a</sup>, D.I. La Milia<sup>a</sup>, E. Rizzitelli<sup>b</sup>, S. Aquilani<sup>c</sup>, M.P. Briata<sup>d</sup>, V. Frumento<sup>d</sup>, L. Marensi<sup>e</sup>, A. Spadea<sup>f</sup>, V. Turello<sup>e</sup>, R. Gasparini<sup>b</sup>, W. Ricciardi<sup>a</sup>

<sup>a</sup> Istituto di Sanità Pubblica – Sezione di Igiene, Università Cattolica del Sacro Cuore, Roma, Italy

<sup>b</sup> Dipartimento di Scienze della Salute, Università degli Studi di Genova, Italy

<sup>c</sup> Dipartimento di Prevenzione ASL Viterbo, Italy

<sup>d</sup> Dipartimento di Prevenzione S.C. Igiene e Sanità Pubblica ASL2 savonese, Italy

<sup>e</sup> Dipartimento di Prevenzione S.C. Igiene e Sanità Pubblica ASL3 genovese, Italy

<sup>f</sup> UOS Medicina Preventiva Età Evolutiva IV Distretto, ASL RMA, Italy

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## ABSTRACT

**Objectives:** This study addressed knowledge of *Streptococcus pneumoniae*, *Neisseria meningitidis* and human papillomavirus (HPV), and attitudes and behaviours towards vaccines against them.

**Study design:** This is a cross-sectional, multicentre study.

**Methods:** Data were collected through a questionnaire administered to 530 adults who accessed four Departments of Prevention of the Italian National Health Service in 2013.

**Results:** Less than 50% of people gave the right answer to all the questions concerning the three diseases, but 96.2%, 94% and 92.7% agreed with the importance of vaccination against *N. meningitidis*, *S. pneumoniae* and HPV, respectively, and 58.4% expressed own willingness to have their children vaccinated with *N. meningitidis* B vaccine. The attitude towards vaccination was more positive in women for *N. meningitidis* and in people having children for HPV. Furthermore, individuals giving correct answers to all knowledge items were more in favour of both HPV and *S. pneumoniae* vaccination. A total of 68.8%, 82.6% and 84.5% of respondents vaccinated their own children against *N. meningitidis* C, *S. pneumoniae* and HPV, respectively. About 50% of the respondents reported paediatricians' or other health professionals' recommendations as the main reason for vaccination.

\* Corresponding author: Institute of Public Health, Catholic University of the Sacred Heart, L.go F. Vito 1, 00168 Rome, Italy. Fax: +39 06 35001522.

E-mail address: [chiara.dewaure@unicatt.it](mailto:chiara.dewaure@unicatt.it) (C. de Waure).

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**Conclusions:** Vaccinations may be promoted through actions aimed at increasing citizens' knowledge. Health professionals should be educated to actively provide information on vaccinations in a clear, comprehensive and effective way.

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## Introduction

Vaccinations are the most effective tools for preventing infectious diseases.<sup>1</sup> Immunization programs have led to eradication of smallpox, elimination of poliomyelitis in almost all regions of the world and substantial reductions in morbidity and mortality from diphtheria, tetanus, and pertussis.<sup>2</sup>

Notwithstanding it, global statistics underline that available vaccines are not being used to their fullest potential.<sup>2</sup> Not only is there room for improvement of vaccination coverage, but it is also necessary to extend vaccinations to unreached populations and to teenagers, adults and the elderly.<sup>2</sup> It is well known that scepticism and critical attitudes towards vaccines are present worldwide.<sup>3</sup> The decline in the incidence of vaccine-preventable diseases was probably accompanied by a decreased awareness and perception of their most severe complications and sequelae. This may have led to an underestimation of the potential benefits of mass immunization and herd immunity.<sup>4</sup> Quite surprisingly, on the other hand, even extremely rare adverse events linked to vaccination may generate a disastrous lack of trust.<sup>3</sup> Many studies have been conducted about knowledge, attitudes and behaviours, but most of them have addressed only a specific vaccine-preventable disease. For example, several recent European studies have focused on vaccination against seasonal and pandemic influenza<sup>5–11</sup> or on simultaneous immunization against influenza and pneumococcal diseases.<sup>12</sup> Also human papillomavirus (HPV) vaccine has been investigated with respect to knowledge and attitudes of young people to get vaccinated, parents to vaccinate their children and physicians to vaccinate their patients.<sup>13–16</sup> These studies also focused on determinants of vaccine acceptability. They highlighted the fundamental role of family doctors and children's healthcare providers, whose advice is valued by most parents.<sup>9,13</sup> They also confirmed that information provided by media does not seem to affect acceptability as much as information provided by trusted healthcare professionals.<sup>8</sup> Still, to date, studies on knowledge, attitudes and behaviours of lay adults regarding multiple vaccine-preventable diseases, especially those for which vaccines are not compulsory but only recommended, are lacking. Such studies may highlight differences in the acceptability of different vaccines, thus suggesting the need to find innovative solutions in the promotion of vaccines. This information is particularly relevant with respect to new vaccines, such as that against *Neisseria meningitidis* B.

Some vaccines, that is those against *Streptococcus pneumoniae*, *N. meningitidis* and HPV, were recently introduced or have been submitted to changes into the vaccination schedule in Italy (with differences among regions). The HPV vaccine was

introduced in 2007 and is currently administered free of charge to all teenagers. The heptavalent conjugate pneumococcal vaccine was available since 2001 and was replaced by the 13-valent conjugate pneumococcal vaccine in 2010 which is currently offered free of charge to all newborns. The *N. meningitidis* C vaccine was recommended to all newborns from 2005 onward, while the *N. meningitidis* B vaccine was only introduced in 2014 and is going to be eventually included in the vaccination schedule according to the new National Immunization Plan.<sup>17</sup> Little is known on knowledge, attitudes and behaviours of the Italian population towards these vaccines, but this information may be useful for education and awareness campaigns in order to maximize vaccination coverage also in the light of the introduction of new vaccines, such as meningococcal B one. The aim of the present study was to assess knowledge, attitudes and behaviours of adults in relation to diseases due to *S. pneumoniae*, *N. meningitidis* and HPV and their vaccinations, and to investigate the main factors leading to the choice to get their children vaccinated. This study could therefore contribute to develop evidence-based approaches to the communication of the importance of vaccinations in the general population.

## Methods

A multicentre cross-sectional study was conducted in a 6-month period (from April 1 to September 30, 2013) at four Departments of Prevention belonging to Local Health Authority (LHA) 3 of Genoa, LHA 2 of Savona, LHA A of Rome, and LHA of Viterbo. Each subject accessing the department for any kind of healthcare service was asked to voluntarily participate to the study. Enrolment of subjects was performed by eight researchers who were entrusted to hand in the self-administered questionnaire to participants. Information collected through questionnaires was maintained anonymous in agreement to the Italian law 196/2003 on privacy.

### Study population

Eligible subjects were people aged  $\geq 18$  years that accessed the departments in selected index days during the study period. Sample size was determined with respect to the expected willingness to have children vaccinated with meningococcal B vaccine. The following parameters were used:

- estimated willingness of 50%; and
- size of population equal to 24,831,149 (half of the population aged at least 18 years in 2013).

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