

(KAP) towards immunizations has therefore the potential to significantly improve occupational health and safety.

#### Methods:

A questionnaire-based cross-sectional study was performed during October 2018, collecting a convenience sample among FR from the Parma Province. Participants were inquired on 3 recommended vaccinations (i.e. seasonal influenza vaccine, SIV; measles vaccine, MeV; pertussis vaccine, Pa) and for meningococcal vaccines (MEN, not officially recommended in FR). Knowledge status (KS) and Risk Perception (RP) were assessed as percent values. Multivariate odds ratios (mOR) for factors associated with vaccination status were calculated by means of a binary logistic regression analysis.

#### Results:

A total of 161 questionnaires were retrieved (mean age  $45.1 \pm 14.1$  years; seniority  $10.8 \pm 8.6$  years). Internal consistency was good (Cronbach's  $\alpha = 0.894$ ). KS was unsatisfying ( $46.5\% \pm 32.4$ ) with uncertainties on the recommendations for MeV and MEN (39.1% and 34.2% incorrect answers). The majority of respondents were favorable towards MEN (89.4%), MeV (87.5%), Pa (83.0%), while 55.3% exhibited a favorable attitude for SIV, and 28.0% had received SIV 2018 (self-reported lifetime status for MEN 26.1%, MeV 42.2%, Pa 34.8%). RP was unsatisfying, particularly for SIV ( $33.9\% \pm 18.4$ ). Interestingly enough, neither KS nor RP were associated with vaccination rates, being the main predictor for SIV 2018 a seniority  $\geq 10$  years (mOR 3.26, 95%CI 1.35-7.91), and higher educational achievements for both Pa (mOR 3.27, 95%CI 1.29-8.30) and MeV (mOR 2.69, 95%CI 1.09-6.65).

#### Conclusions:

Reasons for vaccination gaps in FR apparently do not find their roots only in FRs' incomplete KS or RP. However, the very low vaccination rates for SIV, MeV and Pa recommends stronger and more appropriate information campaigns.

#### Key messages:

- Main drivers of vaccination status in First Responders are not solely their knowledge status or risk perception.
- Achieving better vaccination rates in First Responders requires the understanding of a complex interplay of individual factors.

### Compulsory vaccination policies: a systematic review about knowledge, attitudes and believes

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#### Background:

Vaccine hesitancy is a considerable issue in European Countries and leads to low coverage rates. Consequently, the implementation of national immunization programmes including the introduction of compulsory vaccination are required. It is interesting to determine citizens' knowledge, attitudes and believes about vaccination policies, in order to more effectively define vaccination programs.

#### Methods:

The present study systematically reviewed published studies evaluating attitudes towards mandatory vaccination programs. PubMed and Scopus scientific databases were searched and 4,198 results were returned, of these 29 met the inclusion criteria. PRISMA statements were followed.

#### Results:

Twenty-two studies assessed attitudes towards mandatory vaccination programs in general, while 9 papers focused specifically on the Human Papilloma Virus (HPV) vaccine. Most of the studies were performed in Europe and North America. According to the assessed studies, the majority of the population seems to be in favour of compulsory vaccinations, from 53% to 97% for different vaccination programs. More resistance has been recorded for the HPV vaccination: the

percentage of agreement for mandatory HPV vaccinations ranged from 27% to 63.5%. Furthermore, some studies investigated healthcare workers' attitudes towards childhood and adult vaccinations. They pointed out that the general population is generally more in favour of mandatory vaccination policies than healthcare workers. The studies highlighted that the support to mandatory policies increased after their implementations.

#### Conclusions:

The results presented in this review could be an important starting point to further understand the issue of vaccine hesitancy and support the implementation of effective vaccination strategies in Europe.

#### Key messages:

- Mandatory vaccination policies are generally well accepted among general population.
- More resistance is recorded for specific vaccination (HPV) or among specific population (healthcare workers).

### Opinions and beliefs in vaccine hesitant parents in Italy: what makes the difference

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Vaccine hesitancy has been defined as the delay of acceptance or refusal of vaccines. Hesitant parents' (HP) fluctuate between anti-vaccine (AP) and pro-vaccine parents' (PP) positions. In the light of alarming results from recent Eurobarometer 488, our aim was to identify sensitive topics harbouring the widest opinion gap between HP and PP.

In 2017, an online questionnaire was administered to parents with children aged 3-84 months. Parents were classified as PP, HP or AP based on self-reported vaccine status and timeliness of vaccinations. Agreement with 25 items was assessed with 5-point Likert scale. Items were combined into 8 topics (benefit/risk of vaccines, trust/mistrust in healthcare workers, administration policies, complacency, sense of community, freedom of choice) and scores calculated. Internal consistency was evaluated with Cronbach's  $\alpha$ ; t-tests (sig.  $<.05$ ) were used (Norman G, 2018).

The study included 3,865 parents (64% PP; 32% HP; 4% AP). Cronbach's  $\alpha$  ranged 0.77-0.92. The widest gap concerned the sense of community: HP (2.7/5.0) cared significantly less than PP (4.7) about the usefulness of vaccine in protecting other children and claimed for a complete freedom in decision to vaccinate (3.6) more than PP (1.8). HP were worried (4.1) about current vaccination schedule (PP 2.1): simultaneous administration and age at vaccination (considered too young) were matter of concern. Among HP, mistrust of healthcare workers (3.7) and fear of side effects (3.8) played an important role, but the gap with PP was narrower compared with abovementioned topics; awareness in vaccine benefits reached 3.7. Agreement with complacent attitudes was low (2.2) with the least difference with PP (1.2).

HP showed to partially consider benefits of vaccines on a community scale, claiming for a private nature of this choice. The existence of a consistent opinion gap about the vaccination schedule may suggest the need for a sharper focus on current communication tools and strategies.

#### Key messages:

- While hesitant parents share some concerns with pro-vaccine, relevant opinion gaps may serve as warning lights, pointing at topics potentially harbouring the most sensitive drivers of hesitancy.
- Communication strategies should primarily focus on raising acquaintance of hesitant parents with benefits arising from herd immunity and compliance with the suggested vaccination schedule.