

### Widening disparities in teen hpv vaccinations during covid-19 pandemic: A case study Italy

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**Introduction:** In Local Health Unit 7, human papillomavirus (HPV) vaccination campaigns for 12-year-olds have long been implemented by the vaccination services of the Department of Prevention. Due to the pressure of the COVID-19 pandemic on these services, an emergency vaccination campaign was directly managed by primary care pediatricians (PCPs). An initial evaluation of this experience was conducted.

**Materials and methods**

Data on 12-year-olds assisted by PCPs belonging to the 2006 (pre-pandemic) and 2008 (pandemic) birth cohorts were extracted, along with HPV vaccination data. Health district, gender, citizenship, socioeconomic status, and PCPs were evaluated as possible influencing factors in a two-level logistic regression (second level: single PCP).

**Results:** The HPV vaccination gap between males and females increased significantly for the 2008 compared to 2006 birth cohort (11 vs. 4 percentage points). As for PCPs, the vaccination uptake range was 4-71% for the 2008 birth cohort vs. 32-85% for the 2006 cohort. The proportion of variance explained at the second level was overall equal to 9.7% for the 2008 cohort vs. 3.6% for the 2006 cohort.

**Conclusions:** The vaccination campaign carried out during the peak of the COVID-19 pandemic increased the HPV vaccination gaps among Health Districts, genders, and individual PCPs, probably due to a lack of homogeneity in professional practices and attitudes toward HPV vaccination. Catch-up interventions are required in the immediate term, while an equity lens approach should be taken for reprogramming the vaccination campaign. Greater involvement of schools and families could ensure a more equitable approach and better uptake.

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### Interventions to increase vaccine uptake in prisons: A global systematic scoping review

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**Background And Objective:** Lack of vaccine uptake is a key global challenge in controlling the spread of infectious diseases in prisons. Based on the international research project "Reaching the hard-to-reach: Increasing access and vaccine uptake among prison populations in Europe (RISE-Vac)" funded by the EU Health Program, we will report the implementation of interventions to increase vaccine uptake among people who live and work in prisons.

**Methods:** Operationalizing the "Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) extension for scoping reviews" criteria, we searched five databases of peer-reviewed literature—PubMed, ISI Web of Science, Cochrane library, Science Direct, and EBSCO—as well as 14 databases of grey literature to access publications between 2012 and 2022. Suitable publications were reviewed by two researchers independently and the quality of these publications was assessed through established quality assessment tools.

**Results:** Of the 11,281 publications identified and reviewed, 17 met the inclusion criteria. For people who live in prisons, the following interventions have been implemented to improve their vaccine uptake: 1) knowledge dissemination through educational courses and open focus group discussion; 2) distribution of learning materials, e.g., posters, factsheets, pamphlets; 3) implementing rapid-schedule vaccination services; 4) revision of the existing vaccination protocols; and 5) prioritizing these individuals in national vaccination programs. For juveniles, the development of virtual forums with youth, guardians, and community partners has been adopted to increase vaccine uptake in prisons. For people who work in prisons, e-learning courses and follow-up information through email communication are the main interventions implemented to increase their vaccination uptake.

**Conclusion:** Considering that most of the people who live in prisons will eventually return to their community and that those who work in prisons return to their community daily, increasing vaccination uptakes as per the measures above should be a key priority for public health investment.

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### Co-administration of vaccines against rotavirus and group b meningococcus is associated with an increased rotavirus vaccination coverage: a 5-year retrospective population study

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**Background:** In Italy Rotavirus vaccination (RVV) is recommended and provided free of charge from 2018, however, the coverage is scattered and suboptimal. The narrow time frame to complete the schedule is a major barrier to vaccine uptake, and co-administration with other vaccines may potentially increase the coverage. Although the co-administration of RVV and Meningococcal Group B vaccines (MenB) is currently not included into product labels, we aimed at studying its impact on RVV coverage.

**Methods:** The Regional Vaccination Registry was used to conduct a retrospective cohort study in children born in Campania Region between January 1, 2016 and December 31, 2020, and receiving vaccines scheduled in the first year of life.

**Results:** A total of 224.110 children accessing the vaccination centers in the study period were included. Overall 60.614 (27.0%) completed the RVV schedule, with a progressive increase over time (from 1.15% in 2016 to 56.92% in 2020), in parallel with MenB/RVV co-administration (from 0.7% in 2016 to 46.85% in 2020). Monovalent RVV schedule (2-doses) was completed in 91.1% of children compared to pentavalent RVV Schedule (3-doses) in 81.3% (p<0.00001).

Children receiving RVV/MenB co-administration had a significant higher chance to complete RV schedule compared to those receiving RVV alone during a specific appointment (94.78% vs 72.26%, Prevalence Ratio -PR- 1.275, 95%CI 1.245-1.295 p<0.00001). The positive effect of RVV/MenB co-administration was more evident for children receiving pentavalent RVV (PR 1.288) than monovalent RVV (PR 1.115), this evidence was confirmed when adjusted for confounding variables (i.e. year of vaccination, local health district, gender).

**Conclusion:** Although still far from the target, the RVV coverage has increased in recent years in Campania Region. Co-administration with MenB vaccine may aid in achieving this goal, especially for Rotateq. More data about safety and tolerability are needed to support co-administration as a key tool to increase coverage.

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### Real life experience of knowledge, attitudes and acceptance rate of covid-19 and influenza vaccine administration in one of the main vaccination hub of sicilian region at the university hospital of palermo, Italy

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**Introduction:** In temperate countries of the southern hemisphere, influenza surveillance showed an increase in influenza circulation in 2022 season, anticipating a peak of influenza cases in the Northern hemisphere during 2022/2023 season. The Italian Health Ministry strongly recommend coadministration of seasonal influenza vaccines with other vaccines, including bivalent COVID-19 vaccines. The Vaccination HUB of University Hospital (UH) of Palermo, since the beginning of the campaign, administered over 90,000 doses of COVID-19 vaccines and more than 900 influenza vaccines have been co-administered with COVID-19 vaccines in the 2021/2022 season.

**Materials and methods**

Data were collected from October to December 2022 at the Vaccination Hub of UH of Palermo, using a self-administered online questionnaire to subjects afferent to the Center, by Google® Forms platform. The research group had access and recorded all data on a password-protected Excel file (ver. 1997-2003). The questionnaire consisting in 15 items, the informative of the study and the consent form was approved by the Ethic Committee of the Palermo's UH

**Results:** Overall, 904 subjects answered the questionnaire. 74.5% of the respondents were willing to receive the co-administration with the COVID19 and seasonal influenza vaccines. The main reason reported for accepting the co-administration was confidence in the official recommendations (43.5%) whereas 46.6% were not willing to receive the co-administration for fear of side effects. At the multivariable analysis subject with age ≤59 years (AdjOR: 0.48; CI95%:0.31-

0.75) and those who received the two vaccines co-administered during the last season (AdJOR: 87.1;CI95%:61.4-463.8) were significantly associated with coadministration during 2022/2023 season.

Conclusion: First data obtained from this study show that those who received COVID19 and seasonal influenza vaccination in the same session also in the 2021/2022 season are willing to receive the co-administration of the two vaccinations again for the current season, arguing for the absolute safety and efficacy of the co-administration.

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### Between compulsory vaccination and the COVID-19 pandemic: effects on the vaccination coverage trend in a province of Southern Italy

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Background and objective: The Italian immunisation schedule includes the main indications for the different types of vaccine, based on the most recent scientific evidences. The purpose of this study is to evaluate the trend of population compliance with mandatory and recommended vaccinations in 2019-2022 in the Messina area after the introduction of the Law 119/2017 and after COVID-19 pandemic.

Methods: This study analyses the data on the vaccination coverage in the Messina area between 2019-2022, and it compares them with the regional and national ones. The research was started on 1st October 2019 and the data were collected through the OnVac program at time 0, 12, 24, 36 months stratified according to the type of vaccine, age group and gender.

Results: Data shows an initial positive trend due to compulsory vaccination, as evidenced by the increased coverage for the hexavalent from one year after the introduction of the law until 2020-2021, followed by a drastic decrease to values below the cut-off. Regarding the flu vaccination, the study records an undulating trend, having an initial decrease in the percentages in 2020, followed by a rise to 80% in 2021 and a new decrease in 2022. It is evident that the maximum vaccination peak occurs thanks to the effect of the Law 119/2017 on compulsory vaccination, followed by a slight positive deflection in the initial phase of the COVID-19 pandemic, and a new collapse in the adhesion of the population, probably linked to the fear of contagion in the health sector.

Conclusion: In conclusion, considering the pandemic implications, we can state that the vaccination obligation is a valid tool for Public Health, but it reveals ineffective if not integrated with an adequate reorganization of the Regional Health System.

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### Monkeypox (mpox)-related knowledge and vaccine hesitancy among czech healthcare professionals

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Background: The recent human monkeypox (MPOX) outbreak in non-endemic countries has raised concerns among public health authorities worldwide. Healthcare professionals (HCPs) play a decisive role during epidemics in transmitting accurate information to the public and motivating them to pursue protective behaviours, including immunisation.

Methods: A cross-sectional survey-based study was conducted in the Czech Republic in September 2022 to evaluate MPOX-related knowledge and vaccination perceptions among HCPs. The study utilised a digital self-administered questionnaire (SAQ) which inquired about participants' sociodemographic and anamnestic characteristics, perceived knowledge of MPOX, factual knowledge, and vaccination perceptions according to the health belief model (HBM).

Results: A total of 341 participants were included in this study; most of them were females (88.9%), allied HCPs (89.4%), heterosexuals (87.1%), married (61.9%), and vaccinated against COVID-19 (91.2%). Only 8.8% of the participants agreed to receive vaccination against MPOX; 44.9% rejected it, while 46.3% were hesitant. While digital news portals (47.5%) and social media (25.8%) were among the most utilised sources of information about MPOX, the scientific journals (5.6%), ECDC (5%), and the U.S. CDC (1.5%) were the least common sources. The participants

demonstrated suboptimal levels of factual knowledge, especially regarding MPOX vaccines ( $1.5 \pm 1.2$  (0-4)) and treatments ( $0.9 \pm 0.9$  (0-4)). Additionally, several misconceptions were detectable among the participants regarding topics such as the availability of effective vaccines and antivirals against MPOX, the risk of vertical transmission, and homosexual stigmatisation. The HBM indicated that the cues to action and perceived susceptibility were the most important constructs to predict MPOX vaccine acceptance.

Conclusions: The findings of this study call upon public health practitioners and health policymakers in the Czech Republic to tailor dedicated educational campaigns should encounter the HCPs' misconceptions about MPOX, and future studies should explore the prevalence and drivers of MPOX vaccine hesitancy among the general population.

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### What is the difference between choosing to vaccinate for a mandatorily or recommended vaccine?

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Background and Objectives: The National Immunization Prevention Plan 2017-2019 (extended to 2021) states that Diphtheria, Tetanus, acellular Pertussis (dTap) and Inactivated Poliomyelitis vaccine (IPV) have to be boost between 11 and 18 years of age, mandatorily. Among other vaccines, conjugated quadrivalent meningococcus (Men ACWY) is recommended during adolescence. The present study aimed to investigate dTap-IPV and Men ACWY coverage and potential predictors of the uptake among undergraduate university students in Southern Italy.

Methods: This cross-sectional survey was conducted through an anonymous online questionnaire that included socio-demographic characteristics, attitudes, and reasons for not having received vaccinations and willingness to receive vaccinations.

Results: Preliminary findings refer to a sample of 407 respondents with a mean age of 22.8 years (SD±2.9). During adolescence, 88.6% of respondents received dTap-IPV vaccine, 74% had received the Men ACWY and over two-third of the sample received both vaccinations. Among dTap-IPV unvaccinated students, 39.3% declared to be unwilling to receive the vaccine booster because they believed to be not at risk of contracting vaccine preventable infectious diseases (46%), vaccination was not offered to them (41%) and because they were afraid about potential serious side effects (13.6%). Furthermore, the reasons for not getting Men ACWY were the lack of vaccination proposal (59.4%), the fear of serious side effects (20.3%), believing to be not at risk of meningococcal infection (18.8%) and, lastly, because it was not mandatory (10.9%).

Conclusion: Preliminary results show low perception of the risk of acquiring vaccine-preventable diseases and this represent a key issue to address in order to keep high vaccines' coverage. Although it is preferable that public acceptance make compulsory vaccination programs unnecessary, the finding that some young adults did not get vaccinated against Men ACWY, since it is not mandatory, highlight the need of better understanding the impact on immunization coverage of different approaches.

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### Digital Assessment and Intervention based on HPV vaccination hesitancy and related cognitive biases

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Background and Objective: The HPV vaccination is considered an essential prevention strategy by the World Health Organization (WHO). The Italian Ministry of Health set the goal to reach the 95% vaccinated female and male population susceptible by age. However, the coverage remains below 70%. Vaccine hesitancy (VH) is linked to the risks and benefits information of HPV immunization, but knowledge alone is insufficient to determine the vaccination choice. Individual decision-making is influenced by cognitive biases that distort severity and costs perception of vaccination behavior. This study aims to provide a characterization of the decision-making and cognitive biases in adolescents and design a promotional strategy targeting HPV VH.

Methods: The project is bounded into two phases. First, a sample size of 500 subjects aged 14-20 will be investigated through an online questionnaire regarding decision-making and related biases involved in HPV vaccination choice. Secondly,