EPICOVID19 - National Epidemiological Survey on COVID-19

EPICOVID19 is a large-scale surveillance study focused on the diffusion of COVID-19 in Italy and identification of conditions associated with the disease spread and health outcomes. The study, conducted by CNR institutes ITB (coordinator), IFC, and IN, in collaboration with the University of Milan, SIGG and SIMIT, provides evidence for the public health intervention programmes and epidemic management.

EPICOVID19 study was designed to respond quickly and efficiently to numerous uncertainties that emerged during the initial phases of the COVID-19 spread in Italy [1]. The study consists of a base-line survey [1-4] (April 2020), a validation study [2] (May 2020), and a follow-up survey (December 2020). EPICOVID19 survey is an Italian cross-sectional web-based survey, administered to a national convenience sample of volunteers who have been recruited via Web and social media (Facebook, Twitter, Instagram, Whatsapp), press releases, internet pages, local radio, TV stations, and institutional websites. The European Commission's open-source tool *EUSurvey* was used to collect the data. The inclusion criteria for participation in the survey were: (i) being 18 or older; (ii) having access to a mobile phone, computer, or tablet with internet connectivity; (iii) giving informed on-line consent to participate in the study. Those who did not meet these requirements were excluded from the study sample. The EPICOVID19 base-line survey is structured in nine sets of questions (38 items) covering the main areas of interest for the study of disease transmission (socio-demographic data; clinical evaluation; personal characteristics; housing conditions; lifestyle; behaviours following the lockdown). Data are collected anonymously. The study received the approval of the Ethics Committee of the INMI Lazzaro Spallanzani IRCCS, the only ethical committee pursuant to Article 40 of the Italian Decree - Legislation No 08/04/2020 23. The study was registered at ClinicalTrials.gov (NCT04471701).

Between the 13th and 31st of May 2020, 198828 people responded to the survey, 118657 (59.7%) were women, while the participants' mean age was 47.9 years [1]. Out of the 6676 respondents with known NPS test results, 528 had been hospitalized. Among the 6148 non-hospitalized respondents, those with positive Nasopharingeal Swab (NPS) tests (21.0%) most frequently reported myalgia (56.0%), olfactory and taste disorders (54.8%), cough (50.7%), and fever (50.8%), whereas 12.4% were asymptomatic. In an initial study on 171310 participants, multiple regression analysis showed that olfactory and taste disorders, fever, myalgia, and cough were associated with NPS positivity [1]. Having two to four of these symptoms increased the aOR from 7.4 (95% CI 5.6-9.7) to 35.5 (95% CI 24.6-52.2). The combination of the four symptoms showed an AUC of 0.810 (95% CI 0.795-0.825) in classifying positive NPS test results and then was applied to the non-hospitalized and non-tested sample (n=165,782). Importantly, 7739 to 20,103 of 165,782 respondents (4.4% to 12.1%) had experienced symptoms suggestive of COVID-19 infection, leading to an estimation of ~2.2 million of non-tested symptomatic possible cases in Italy during March-April 2020.

The validation study VALID-EPICOVID19 [2] enrolled 2703 participants from the EPICOVID19 cohort of ~100.000 participants who expressed interest to participate in the follow-up studies. The participants had undergone the nasopharyngeal swabs and serological tests [2] that lead to a more precise assessment of the occurrence of COVID-19 at national level, additionally confirming reliability of the survey and indicators for health policy and emergency management.

The EPICOVID19 study uncovered that the respondents who received a pneumococcal vaccination in the year preceding the survey were less likely to have a positive SARS-CoV-2 test than the unvaccinated participants [4]. The pneumococcal vaccination was associated with a 39% and 44% lower chance of having a positive test result in those younger than 65 and older, respectively. In the case of influenza vaccination, the risk reduction was observed only in participants younger than 65 years of age (15%), while among the older participants there was no significant association between influenza vaccination and test positivity.

The EPICOVID19 study reviled a flu vaccination rate in the 2019/2020 season [3], of 53.4% in subjects aged ≥ 65 years, consistently far from the target of 75% set by the national health authorities. Having ≥ 65 years and having a high education level were independently associated to flu vaccination. Nursing home residents aged ≥ 65 years showed lower odds of being vaccinated (aOR 0.39 (95%CI 0.28–0.54)). The data indicate the need for an urgent public heath effort to fill the gap of missed vaccination opportunities reported in the past flu seasons [3].

The forthcoming analysis and a follow-up study will provide additional evidence, identifying vulnerable categories of individuals and informing the decision makers on public health interventions, vaccination campaigns, and clinical assessment of patients based on self-reported symptoms validated in EPICOVID19 study.

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