

Developing approaches to control SARS-CoV-2 in a public hospital

The Territorial Public Health Care Company (in Italian, ASST) of the Saints Paolo e Carlo of Milano includes two large public hospitals, and several outpatients and territorial healthcare services. It employs 5642 workers. The outbreak of novel coronavirus disease 2019 (COVID-19) reached our ASST in the last week of February when a doctor in the Intensive Care Unit of the San Paolo Hospital was diagnosed with COVID-19. Our Occupational Health Unit immediately introduced measures to control the epidemic.

Our approach was based on contact tracing and isolation of asymptomatic infected workers. A 'close contact' was defined as a person who had face-to-face contact or spent at least 15 min in an indoor environment with a positive subject (patient, colleague or relative) without any protective equipment (surgical mask). From 27 February to 23 April we tested 2907 workers (51% of the total workforce) with nasopharyngeal swabs (NPS) using rtPCR for SARS-CoV-2 detection [1,2], with positive results in 152 hospital and 33 territorial workers (3% of the total workforce). All the infected workers were asked to fill in a daily electronic data collection form for the duration of the infection.

About 50% remained substantially asymptomatic for the quarantine period, which ended when the workers underwent two NPS on two consecutive days with a negative result. The time to recovery took from 12–47 days, with a median duration of about 30 days, which is longer than normally expected. Symptomatic workers showed only very mild symptoms; mainly loss/change of smell and taste. Four were hospitalized but none had severe or life-threatening infection. The data suggest that the 'active search approach' is more effective in closed communities such as groups of healthcare workers than generalized testing.

We have started a retrospective survey of 100 positive workers studying symptoms, source of exposure and co-morbidities using a modified version of the 'WHO novel coronavirus acute respiratory infection clinical characterization data tool', administered by telephone

interview. Finally, in order to prepare for future outbreaks, we are testing a novel telemedicine approach enabling us to follow quarantined workers with a digital platform with a mobile phone app that provides remote video examinations and online symptoms and health parameter checking (body temperature, oxygen saturation, etc.). The platform facilitates rapid intervention. Using this approach, we can follow a large cohort of workers with continuous monitoring. The tool may also be able to reduce the rate of patients' hospitalization. We are also comparing those with positive and negative swabs using a rapid immunochromatographic assay for the detection of IgG and IgM antibodies to SARS-CoV-2 virus in whole blood to assess potential immunity. Preliminary results are promising for IgG, even though the protective capacity of this immunoglobulin is still unknown.

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