Letter to the Editor

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Prevention and control of COVID-19 in the penitentiary of Florence

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To the Editor,

Due to the dramatic diffusion of the coronavirus disease 2019 (COVID-19), an infectious disease caused by a novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), responsible for an acute respiratory syndrome that has spread rapidly all over the world causing thousands of deaths, we consider both the prevention and control of SARS-CoV-2 virus fundamental in prisons. Italy has 53,187 prisoners and during the first wave, the Italian government stated that 159 inmates had laboratory-confirmed COVID-19 (0.3%) and that seven detainees had died of COVID-19 (0.01%) [1].

Prison is a high-risk environment for contagion for infectious diseases, especially those transmitted through respiratory droplets, as the several recent series of flu outbreaks in prison have shown [2]. The main factors responsible for a prison's vulnerability to infectious

diseases are overcrowding, lack of space and comorbidities such as human immunodeficiency virus (HIV), hepatitis B virus (HBV) and hepatitis C virus (HCV) infections. In particular, the overcrowding rate in Italy was about 120% across the country, with peaks of 140% in Lombardy [3]; the "Cura Italia" decree allowed home detention for inmates serving a sentence or a residual sentence of up to 18 months [4]. The World Health Organization (WHO) and the Centers for Disease Control and Prevention (CDC) published the general guidelines for managing SARS-CoV-2 infection in prison [5, 6]. In Italy, the Minister of Justice declared specific measures for detention institutions, such as blocking prison visits between inmates and external people, replaced by video calls; halting prisoner transfers between different prisons; transforming prison detention into house arrest for minor crimes and short arrests and adopting alternative sentences to reduce prison overpopulation. At Florence prisons, an entrance checkpoint was organized to check the body temperature of each incoming person, since external people are one of the greatest vehicles of infection for an isolated community like a prison. New inmates were housed in dedicated cells for 14 days in isolation before being mixed with the other inmates and, during the 14-day isolation period, the new inmates were subjected to active observation with blood tests and monitoring of vital signs. Any suspected cases were housed in dedicated cells in different areas of the prison and then were evaluated by a physician who decided either to refer them to the emergency department or treat them directly in-house. The suspected cases were first subjected to a nasopharyngeal swab and then had their body temperature and blood oxygen saturation level monitored, while remaining isolated from the others until receiving their swab results. For a negative swab, the suspected case remained isolated for at least 48 h until symptoms resolved. For a confirmed SARS-CoV-2 infection, the patient was either referred to the emergency department or isolated and followed-up in dedicated cells. Isolating asymptomatic subjects, who

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have come into contact with positive SARS-CoV-2 individuals, is one of the most important measures to reduce disease transmission. The prisoners, prison officers and health workers of the three public prisons of Florence “Nuovo Complesso Penitenziario Sollicciano”, “Casa Circondariale Mario Gozzini” and “Istituto Penale per Minorenni Meucci”, underwent health surveillance according to WHO and CDC guideline prevention measures. All patients gave their written informed consent based on the prospective nature of the study according to the Declaration of Helsinki and to the Italian legislation (Authorization of the Privacy Guarantor n.9, 12 December 2013). The immunological response to SARS-CoV-2 IgG and IgM antibodies was carried out through both qualitative immunochromatographic (Medical System, China) and quantitative chemiluminescent (Shenzhen YHLO Biotech Co, Ltd, China) serological tests [7], given the resource scarcity of swabs and the inter-methods variability. On the basis of at least one anti-SARS-CoV-2 antibody, viral RNA was detected. A similar risk management strategy was adopted for only the incarcerated in the penitentiary facilities of the Salerno Province [8] based on qualitative serum COVID-19 screening of all 485 convicted inmates followed by a pharyngeal swab for those who had a positive result; of these, 3 (0.6%) were positive but none were confirmed by pharyngeal swab. Njuguna et al. reported that the Louisiana Department of Health and CDC utilized a serial laboratory testing approach with nasopharyngeal swabs on days 1, 4, and 14, assessing COVID-19 symptoms. It helped to identify a high proportion (72%) of asymptomatic and pre-symptomatic cases [9]. CDC requested data from 15 US jurisdictions describing results of mass testing by RT-PCR nasopharyngeal swabs in the incarcerated population showing a 12.3-fold increase in COVID-19 infections [10]. Moreover, in Puerto Rico State prisons the strategy to evaluate the prevalence of the disease was carried out using a point-of-care antibody test, evidencing that 0.3% had immunoglobulin (Ig)G antibodies and no subjects had IgM antibodies [11]. In our study we found that among the 1,181 individuals screened by a double method for antibodies anti-SARS-CoV-2 IgG and IgM, 51 (4.3%) patients were positive for the qualitative test and 24 (2%) were positive for the quantitative method. The subject who was positive for viral RNA (0.1%) was the only one with a positive result for more than two tests. Double positive tests over the total number of positive results ranged from 0 to 5.4%, according to the combination or to the single antibody used. The addition of a second serological test may increase positive and negative predictive values, and therefore better identify individuals to be examined then with a nasopharyngeal swab at times when there is little or no access to molecular testing. Eight out of the 32 IgM positive patients, all with a strong antibody titer but negative for viral RNA, were tested with a

serological follow-up repeating serological assays with a panel test searching for infectious diseases (hepatitis B, Epstein-Barr, hepatitis C, cytomegalovirus, influenza A and B) and autoimmune diseases (rheumatoid factor, anti-nuclear, anti-ENA, and anti-citrullinated antibodies). None of the eight patients showed any relevant laboratory and clinical finding for autoimmune and infectious diseases. Four out of the eight patients studied showed a persistent antibodies titer and also had a second negative swab result. Our study showed how the dual serological strategy associated with the WHO prevention rules and the Italian Ministry of Justice release policy, have proven effective in containing the spread of the virus in Florence's prisons, resulting in only one positive case which was immediately recognized and isolated.

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Ethical approval: Research involving human subjects complied with all relevant national regulations, institutional policies and is in accordance with the tenets of the Helsinki Declaration (as revised in 2013), and has been approved by the authors' Institutional Review Board.

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