Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Practice points

Rapid decrease of SARS-CoV-2 circulation in a large Italian hospital six weeks after the start of the immunization program

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Since the start of SARS-CoV-2 pandemic, clusters in hospital settings have been described worldwide. Therefore, healthcare workers (HCWs) are considered as a group at high risk of SARS-CoV-2 infection [1]. In Italy, in February–May 2020, 119 doctors died because of COVID-19 and globally, in 2020, 91,270 COVID-19 cases were notified among HCWs, with a case-fatality rate of 0.2% [2]. On 27th December 2020, the Italian Ministry of Health began the immunization campaign against SARS-CoV-2, targeting, as a priority group, HCWs.

Policlinico Bari General Hospital is the most important teaching hospital in southern Italy with 1000 beds (150 for COVID-19 patients) in 50 different wards, and 5857 employees. Since April 2020, periodic screening for SARS-CoV-2 infection has been carried out among healthcare workers (HCWs), using polymerase chain reaction on nasopharyngeal swabs. HCWs from COVID-19 units were screened every two weeks; other HCWs were screened monthly [3].

The SARS-CoV-2 immunization campaign started in Policlinico Bari using Pfizer-BioNTech COVID-19 vaccine (two doses with an interval of 21–24 days) on 27th December 2020. By 20th February 2021, 5551/5857 (94.8%) HCWs had received at least one dose of COVID-19 vaccine, 4633 (79.1%) having had both doses. During the immunization campaign, SARS-CoV-2 screening continued.

Here, we present the trends in SARS-CoV-2 infections among Policlinico Bari HCWs from 16th November 2020 to 21st February 2021, to describe the early effects of COVID-19 vaccination on SARS-CoV-2 infections. During this period, all HCWs were screened one or more times, with a total of 23,762 tests being performed. The number of HCWs with a new diagnosis of SARS-CoV-2 infection was 366. We analysed the number of new cases of SARS-CoV-2 (independent variable); the cumulative numbers of subjects who received 1 dose of vaccine 14 days earlier (considered 'partially protected') or who received 2 doses of 7 days earlier (considered 'fully immunized'); and the number of tests performed, per day (as a confounding factor) (Figure 1).

In a multivariate regression analysis, the number of incident cases of SARS-CoV-2 infections correlates with the number of tests performed (coefficient 0.007; 95% confidence interval (CI) = 0.003–0.01; $P<0.0001$) and with the cumulative number

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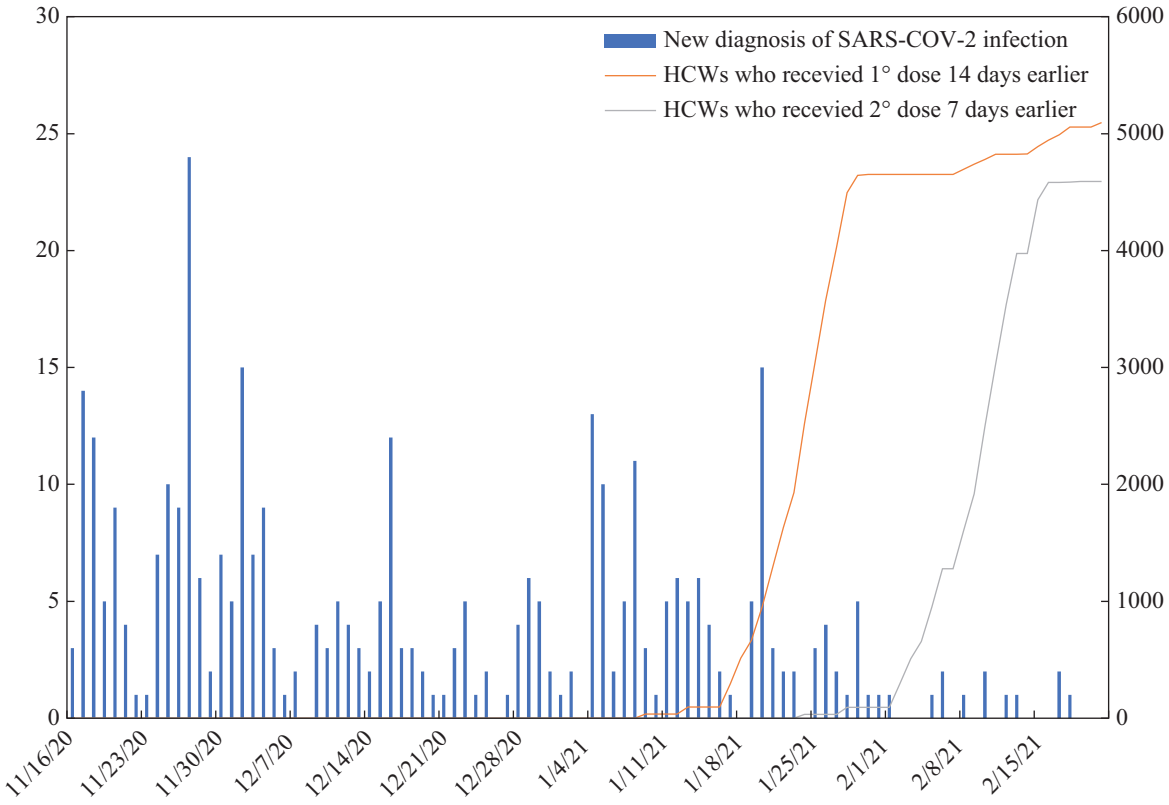

Figure 1. Incident cases of SARS-CoV-2 among Policlinico General Hospital healthcare workers (HCWs), number of HCWs who received the first vaccine dose 14 days earlier and second vaccine dose 7 days earlier.

of subjects 'partially protected' (coefficient -0.0007; 95% CI = -0.001 to -0.0002; P=0.005) while no association emerged for cumulative number of subjects 'fully immunized' (P=0.779).

Our data show an early decrease of the SARS-CoV-2 circulation among HCWs in the first 50 days of vaccination campaign, during which the majority of HCWs had not yet achieved the state of full protection as defined in the official Summary of Product Characteristics (SPC) of COVID-19 vaccine (immunized persons are considered protected against COVID-19 at least seven days after receiving the second dose) [4]. Our results indicate an effect of vaccination on the general burden of disease earlier than the data from the mathematical model for US by Moghadas and Coll [5]; in particular, coverage for the vaccine first dose has an important role in reducing the virus circulation and, thus the number of cases.

Data from Policlinico Bari adds evidence in the debate on the public health priority in the SARS-CoV-2 vaccination strategy. Achieving higher vaccination coverage for the first dose could be more important, in a context with limited human resources and vaccine availability, than completing the second dose offer according to the minimum time reported in the official RCP. This observation is consistent with other recently published experiences [6]. There is now growing evidence that the benefits of prioritizing coverage by giving as many individuals their first dose does not seriously affect vaccine efficacy and immunogenicity, although much guidance continues to advocate completion of the vaccination schedule in accordance with manufacturers' guidance [7,8]. To the effects of direct protection from the first doses of vaccine must be added to the indirect protection related to the reduction of SARS-CoV-2 circulation that is achieved when an important proportion of population is immunized.

Conflict of interest statement
The authors declare no conflict of interest.

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