case rate of 587 per 100 000. The crude COVID-19 death rate in prisons was 39 deaths per 100 000 prisoners, which was higher than the US population rate of 29 deaths per 100 000 (**Table**). However, individuals aged 65 years or older comprised a smaller share of the prison population than of the US population (3% vs 16%, respectively) and accounted for 81% of COVID-19 deaths in the US population. The Table provides a standardized calculation showing that the adjusted death rate in the prison population was 3.0 times higher than would be expected if the age and sex distributions of the US and prison populations were equal.

The **Figure** displays the daily trends in cumulative, confirmed cases of COVID-19 in state and federal prisons and the US population from March 31, 2020, to June 6, 2020. The COVID-19 case rate was initially lower in prisons but surpassed the US population on April 14, 2020. The mean daily case growth rate was 8.3% per day in prisons and 3.4% per day in the US population.

Discussion | COVID-19 case rates have been substantially higher and escalating much more rapidly in prisons than in the US population. One limitation of the study is that it relied on officially reported data, which may be subject to inaccuracies and reporting delays, but are the only data available. Comprehensive data on testing rates were not available, and testing rates in both prisons and the overall population were uneven, with many facilities testing no prisoners or only symptomatic persons.[2,5] Mass testing in select prisons revealed wide COVID-19 outbreaks, with infection rates exceeding 65% in several facilities.[2] Reported case rates for prisoners therefore likely understated the true prevalence of COVID-19 in prisons.

A second limitation is that departments of corrections generally did not report demographic data on decedents, and therefore we could not adjust death rates to account for race/ethnicity and comorbidity. This study focused on prisons but did not include jails or other detention facilities where there have been notable COVID-19 outbreaks. Although some facilities did engage in efforts to control outbreaks, the findings suggest that overall, COVID-19 in US prisons is unlikely to be contained without implementation of more effective infection control.

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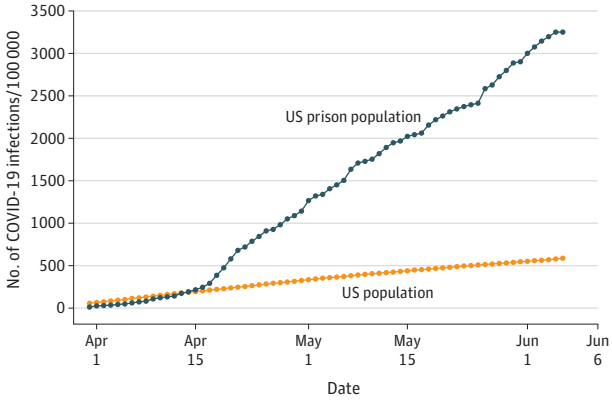
Figure. Trends in Cumulative Coronavirus Disease 2019 (COVID-19) Confirmed Case Rate per 100 000 People for Prison and US Populations



Data are from the UCLA Law COVID-19 Behind Bars Data Project and the US Centers for Disease Control and Prevention.[3,4] The US population is 327 167 439 and the US prison population is 1 295 285.

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Acquisition, analysis, or interpretation of data: All authors.
Drafting of the manuscript: Saloner, Parish, Ward, DiLaura.
Critical revision of the manuscript for important intellectual content: All authors.
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Persistent Symptoms in Patients After Acute COVID-19

In Italy, a large proportion of patients with coronavirus disease 2019 (COVID-19) presented with symptoms (71.4% of 31 845 confirmed cases as of June 3, 2020).[1] Common symptoms include cough, fever, dyspnea, musculoskeletal symptoms (myalgia, joint pain, fatigue), gastrointestinal symptoms, and anosmia/dysgeusia.[2-4] However, information is lacking on symptoms that persist after recovery. We assessed

Table. Demographic and Clinical Characteristics of the Study Sample (N = 143)

Characteristics	Value
Age, mean (SD), y	56.5 (14.6)
Female sex, No. (%)	53 (37.1)
Body mass index, mean (SD)[a]	26.3 (4.4)
Vaccination, No. (%)	
Seasonal influenza	32 (22.4)
Pneumococcus	13 (9.1)
Diagnoses, No. (%)	
Chronic heart disease	7 (4.9)
Atrial fibrillation	4 (2.8)
Heart failure	4 (2.8)
Stroke	2 (1.4)
Hypertension	50 (35)
Diabetes	10 (7)
Kidney failure	3 (2.1)
Thyroid disease	26 (18.2)
Chronic obstructive pulmonary disease	13 (9.1)
Active cancer	5 (3.5)
Immune disorders	16 (11.2)
Regular physical activity, No. (%)	90 (62.9)
Smoking status, No. (%)	
None	63 (44.1)
Active	15 (10.5)
Former	65 (45.4)
Acute COVID-19 characteristics, No. (%)	
Pneumonia diagnosed	104 (72.7)
Intensive care unit admission	18 (12.6)
Oxygen supplementation	
Oxygen therapy	77 (53.8)
Ventilation	
Noninvasive	21 (14.7)
Mechanical	7 (4.9)
Pharmacological treatments during acute COVID-19	
Antiretroviral	102 (71.3)
Hydroxychloroquine	104 (72.7)
Azithromycin	59 (41.3)
Anti-IL-6 drugs (tocilizumab)	44 (30.8)
Length of hospital stay, mean (SD), d	13.5 (9.7)
Post-acute COVID-19 follow-up characteristics	
Days since symptoms onset, mean (SD)	60.3 (13.6)
Days since discharge, mean (SD)	36.1 (12.9)
Persistent symptoms, No. (%)	
None	18 (12.6)
1 or 2	46 (32.2)
≥3	79 (55.2)
Worsened quality of life, No. (%)[b]	63 (44.1)

Abbreviation: COVID-19, coronavirus disease 2019.

[a] Calculated as weight in kilograms divided by height in meters squared.

[b] Quality of life was assessed using the EuroQol visual analog scale, ranging from 0 (worst imaginable health) to 100 (best imaginable health). Worsened quality of life was defined by a 10-point difference in health status before COVID-19 vs at the time of the visit.

persistent symptoms in patients who were discharged from the hospital after recovery from COVID-19.

Methods | In the waning phase of the pandemic, beginning on April 21, 2020, the Fondazione Policlinico Universitario Agostino Gemelli IRCCS in Rome, Italy, established a post-acute outpatient service for individuals discharged from the hospital after recovery from COVID-19. All patients who met World Health Organization criteria for discontinuation of quarantine (no fever for 3 consecutive days, improvement in other symptoms, and 2 negative test results for severe acute respiratory syndrome coronavirus 2 [SARS-CoV-2] 24 hours apart) were followed up. At enrollment in the study, real-time reverse transcriptase–polymerase chain reaction for SARS-CoV-2 was performed and patients with a negative test result were included.

Patients were offered a comprehensive medical assessment with detailed history and physical examination. Data on all clinical characteristics, including clinical and pharmacological history, lifestyle factors, vaccination status, and body measurements, were collected in a structured electronic data collection system. The COVID-19 postacute outpatient service is currently active, and further details about the patient evaluation protocol are described elsewhere.[5]

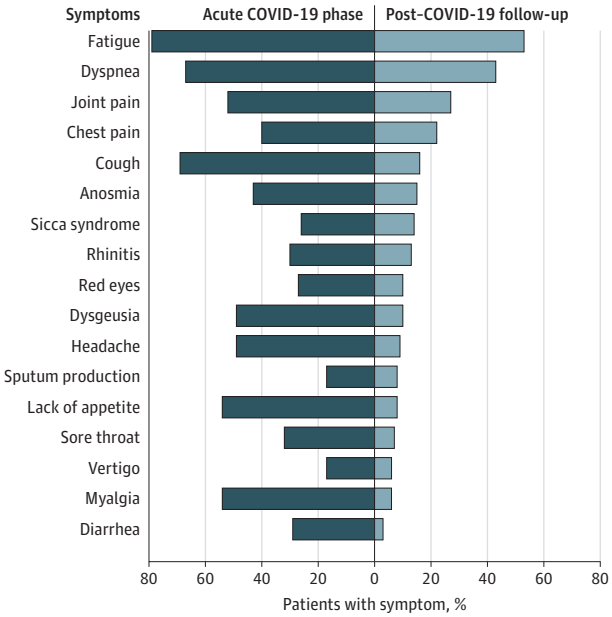
In particular, data on specific symptoms potentially correlated with COVID-19 were obtained using a standardized questionnaire administered at enrollment. Patients were asked to retrospectively recount the presence or absence of symptoms during the acute phase of COVID-19 and whether each symptom persisted at the time of the visit. More than 1 symptom could be reported. The EuroQol visual analog scale was used to ask patients to score their quality of life from 0 (worst imaginable health) to 100 (best imaginable health) before COVID-19 and at the time of the visit. A difference of 10 points defined worsened quality of life. All analyses were performed using R version 3.6.3 (R Foundation).

This study was approved by the Università Cattolica and Fondazione Policlinico Gemelli IRCCS Institutional Ethics Committee. Written informed consent was obtained from all participants.

Results | From April 21 to May 29, 2020, 179 patients were potentially eligible for the follow-up post-acute care assessment; 14 individuals (8%) refused to participate and 22 had a positive test result. Thus, 143 patients were included. The mean age was 56.5 (SD, 14.6) years (range, 19-84 years), and 53 (37%) were women. During hospitalization, 72.7% of participants had evidence of interstitial pneumonia. The mean length of hospital stay was 13.5 (SD, 9.7) days; 21 patients (15%) received noninvasive ventilation and 7 patients (5%) received invasive ventilation. The characteristics of the study population are summarized in the **Table**.

Patients were assessed a mean of 60.3 (SD, 13.6) days after onset of the first COVID-19 symptom; at the time of the evaluation, only 18 (12.6%) were completely free of any COVID-19–related symptom, while 32% had 1 or 2 symptoms and 55% had 3 or more. None of the patients had fever or any signs or symptoms of acute illness. Worsened quality of life was

Figure. COVID-19–Related Symptoms



The figure shows percentages of patients presenting with specific coronavirus disease 2019 (COVID-19)–related symptoms during the acute phase of the disease (left) and at the time of the follow-up visit (right).

observed among 44.1% of patients. The **Figure** shows that a high proportion of individuals still reported fatigue (53.1%), dyspnea (43.4%), joint pain, (27.3%) and chest pain (21.7%).

Discussion | This study found that in patients who had recovered from COVID-19, 87.4% reported persistence of at least 1 symptom, particularly fatigue and dyspnea. Limitations of the study include the lack of information on symptom history before acute COVID-19 illness and the lack of details on symptom severity. Furthermore, this is a single-center study with a relatively small number of patients and without a control group of patients discharged for other reasons. Patients with community-acquired pneumonia can also have persistent symptoms, suggesting that these findings may not be exclusive to COVID-19.[6]

Clinicians and researchers have focused on the acute phase of COVID-19, but continued monitoring after discharge for long-lasting effects is needed.

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Concept and design: All authors.
Drafting of the manuscript: Carfì, Landi.
Critical revision of the manuscript for important intellectual content: Bernabei, Landi.
Statistical analysis: Carfì.
Supervision: Bernabei, Landi.

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Trends in Daily Use of Biotin Supplements Among US Adults, 1999-2016

Over-the-counter biotin supplements, especially in high dosages (≥5 mg/d, or 166-fold greater than the dietary recommendation of 30 µg/d), are widely available and marketed as having health benefits such as stimulating growth of hair and nails. The US Food and Drug Administration (FDA) issued a safety communication in 2017 warning that high-dosage biotin supplement use may interfere with laboratory test accuracy.[1] To understand the potential clinical implications of high-dosage biotin supplement use, we characterized the prevalence and trends in use of 1 mg/d or greater and 5 mg/d or greater of biotin among US adults from 1999 to 2016. A biotin dosage of 1 mg/d or greater was chosen because lower dosages (<1 mg/d) are unlikely to interfere with laboratory tests; a dosage of 5 mg/d or greater was studied because biotin supplements for hair and nail growth often contain 5 mg/d or more.

Methods | Repeated cross-sectional surveys from the nationally representative National Health and Nutrition Examination Survey (NHANES) were used to assess trends in self-reported biotin supplement use of 1 mg/d or greater and 5 mg/d or greater from 1999 to 2016 (9 survey cycles). In each cycle, NHANES sampled noninstitutionalized US residents through a complex, stratified, multistage probability sampling design with certain populations overrepresented (overall response, 74%).[2] Participants provided informed consent.[2] Because the data are publicly available and anonymized, the