

Supplementary Table 1. Description of coding systems and codes

Coding system	Code	Description
<i>Codes for COVID-19 diagnoses</i>		
ICD-10	U07.1, U07.2	COVID-19 (WHO)
ICD-10	B97.29	Other coronavirus as the cause of diseases classified elsewhere
ICD-10	B34.2	Coronavirus infection, unspecified
ICD-10	J12.81	Pneumonia due to SARS-associated coronavirus
LOINC	94505-5,94506-3,94558-4, 94562-6, 94762-2, 94769-7, 95209-3	SARS-CoV-2 (COVID19) [Presence] in Serum or Plasma by Immunoassay
<i>Comorbidity conditions</i>		
ICD-10	I10	Essential (primary) hypertension
ICD-10	J40-J47	Chronic lower respiratory diseases
ICD-10	E10-E11	Diabetes (type I and type II)
ICD-10	E66	Overweight and obesity
ICD-10	I20-I25	Ischemic heart diseases
ICD-10	I50	Heart failure
ICD-10	N18	Chronic kidney disease
ICD-10	F17	Nicotine dependence
ICD-10	F10	Alcohol related disorders
ICD-10	Z55-Z65	Socioeconomic and psychosocial circumstances
<i>Laboratory codes for diagnostic tests</i>		
LOINC	8480-6,76215-3,76534-7,87739-9,87741-5,8459-0,8460-8,8461-6	Systolic blood pressure
LOINC	8462-4,76535-4,87740-7,87736-5,8453-3,8454-1,8455-8,76213-8	Diastolic blood pressure
LOINC	26464-8,49498-9,6690-2,804-5	Leukocytes
LOINC	26478-8,30365-1,736-9,737-7	Lymphocyte count
LOINC	26499-4,751-8,753-4	Neutrophil count
LOINC	26515-7,49497-1,777-3,778-1	Platelets
LOINC	2160-0,38483-4	Serum creatinine
LOINC	3094-0,6299-2	Blood urea nitrogen
LOINC	14804-9,14805-6,2532-0	Lactate dehydrogenase
LOINC	1742-6,1743-4,1744-2,76625-3	Alanine aminotransferase
LOINC	1920-8,30239-8	Aspartate aminotransferase
LOINC	1783-0,6768-6	Alkaline phosphatase
LOINC	20567-4,2276-4,24373-3	Serum ferritin
LOINC	10839-9,42757-5	Troponin I
LOINC	1988-5,30522-7,71426-1	C-reactive protein

Supplementary Table 2. Healthcare utilization among COVID-19 patients on long-term opioid therapy compared to COVID-19 patients not on long-term opioid therapy

Utilization	Before propensity score matching			After propensity score matching		
	Long-term opioid therapy (N=9,558), n (%)	No long-term opioid therapy (N=408,658), n (%)	Risk ratio (95% CI)	Long-term opioid therapy (N=9,558), n (%)	No long-term opioid therapy (N=9,558), n (%)	Risk ratio (95% CI)
ED visit	2,867 (30.0)	32,323 (7.9)	3.80 (3.67,3.92)	2,867 (30.0)	1,404 (14.7)	2.04 (1.93,2.16)
Hospitalization	2,139 (22.4)	13,807 (3.4)	6.62 (6.36,6.90)	2,139 (22.4)	735 (7.7)	2.91 (2.69,3.15)
ICU	664 (7.0)	3,145 (0.8)	9.03 (8.33,9.80)	664 (7.0)	182 (1.9)	3.65 (3.10,4.29)
Mechanical vent	513 (5.4)	2,833 (0.7)	7.75 (7.07,8.50)	513 (5.4)	148 (1.6)	3.47 (2.89,4.15)
Vasopressor	190 (2.0)	779 (0.2)	10.42 (8.9,12.2)	190 (2.0)	36 (0.4)	5.28 (3.70,7.53)
Death (30-day)	425 (4.5)	4,500 (1.1)	4.04 (3.67,4.46)	425 (4.5)	217 (2.3)	1.96 (1.67,2.30)

N: total number of patients in the cohort; n: number of patients with the health outcome; 95% CI: 95% confidence intervals

Mechanical vent: Mechanical ventilation

Supplementary Table 3. Clinical presentation among COVID-19 patients on long-term opioid therapy compared to COVID-19 patients not on long-term opioid therapy

Clinical Presentation	Before propensity score matching			After propensity score matching		
	Long-term opioid therapy (N=9,558), n (%)	No long-term opioid therapy (N=408,658), n (%)	Risk ratio (95% CI)	Long-term opioid therapy (N=9,558), n (%)	No long-term opioid therapy (N=9,558), n (%)	Risk ratio (95% CI)
Cough	1,458 (15.3)	15,350 (3.8)	4.06 (3.87,4.27)	1,458 (15.3)	707 (7.4)	2.06 (1.89,2.25)
Fever	597 (6.2)	5,619 (1.4)	4.54 (4.18,4.93)	597 (6.2)	266 (2.8)	2.24 (1.94,2.58)
ARDS	195 (2.0)	996 (0.2)	8.37 (7.18,9.74)	195 (2.0)	49 (0.5)	3.98 (2.91,5.44)
Hypoxemia	673 (7.0)	4,581 (1.1)	6.28 (5.80,6.79)	673 (7.0)	278 (2.9)	2.41 (2.10,2.76)
Dyspnea	2,043 (21.4)	1,6467 (4.0)	5.31 (5.10,5.54)	2,043 (21.4)	936 (9.8)	2.18 (2.03,2.35)
Thrombocytopenia	265 (2.8)	1,391 (0.3)	8.14 (7.15,9.27)	265 (2.8)	116 (1.2)	2.28 (1.84,2.84)

N: total number of patients in the cohort; n: number of patients with the health outcome; 95% CI: 95% confidence intervals

Mechanical vent: Mechanical ventilation