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Background. The long-term health effects after SARS-CoV-2 infection remain poorly understood. We evaluated health and healthcare usage after SARS-CoV-2 infection via surveys and longitudinal electronic medical record (EMR) review within the Military Health System (MHS).

Methods. We studied MHS beneficiaries enrolled in the Epidemiology, Immunology, and Clinical Characteristics of Emerging Infectious Diseases with Pandemic Potential (EPICC) cohort from March to December 2020. COVID-19 illness symptom severity and duration were derived from surveys initiated in late 2020. In addition, multi-year healthcare encounter history before and after onset of COVID-19 symptoms was collected from the MHS EMR. Odds of organ-system clinical diagnoses within the 3 months pre- and post-symptom onset were calculated using generalized linear models, controlling for age, sex, and race, and including participant as a random effect.

Results. 1,015 participants were included who were SARS-CoV-2 positive, symptomatic, and had 3-month follow-up data available in the EMR (Table 1). 625 of these participants had survey data collected more than 28 days post-symptom onset, among whom 17% and 6% reported persistent symptoms at 28-84 days, and 85+ days, respectively. 9.6% had not resumed normal activities by one month. The most frequently reported symptoms persisting beyond 28 days were dyspnea, loss of smell and/or taste, fatigue, and exercise intolerance (Figure 1A). When compared with the period 61 to 90 days prior to symptom onset, the first month post-symptom onset period was associated with increases of pulmonary (aOR = 57, 95% CI 28-112), renal (aOR = 29, 95% CI 10-84), cardiovascular (aOR = 7, 95% CI 5-11), and neurological diagnoses (aOR = 3, 95% CI 2-4) (Figures 1B and 1C). Cardiovascular disease diagnoses remained elevated through 3 months (aOR = 2, 95% CI 1-3).

Table 1. Characteristics of SARS-CoV-2+ EPICC participants, and illness duration among those with 28+ days post-symptom onset survey data collection.

	N=1015
Age group (years)	
<18	21 (2.1%)
18-44	594 (58.5%)
45-64	288 (28.4%)
65+	112 (11.0%)
Male	631 (62.2%)
Race/ethnicity	
Black	162 (16.0%)
Hispanic	276 (27.2%)
Other	116 (11.4%)
White	461 (45.4%)
Military status	
Active duty	493 (48.6%)
Dependent	281 (27.7%)
Missing	2 (0.2%)
Retired military	239 (23.5%)
With survey information beyond 28 days post-symptom onset	N=639
New home oxygen therapy	24 (3.8%)
Illness resolved	606 (94.8%)
Time to recovery	
Median (Q1, Q3)	14.0 (8.0, 25.0)
Min - Max	0.0 - 337.0
N	606
Resolved illness duration category	
<28	466 (76.9%)
28-84	106 (17.5%)
85+	34 (5.6%)
Time ill (if not recovered)	
Median (Q1, Q3)	46.0 (33.0, 87.0)
Min - Max	28.0 - 235.0
N	33
Missed work or unable to fulfil normal activities	485 (75.9%)
Returned to normal activities	437 (90.1%)
Number of days off duty/work	
Median (Q1, Q3)	14.0 (10.0, 20.0)
Min - Max	0.0 - 210.0
N	482
Maximum symptom severity reported in survey	
Mild (noticeable but not impairing)	300 (47.5%)
Moderate (impairing but not disabling; interferes with duties)	226 (35.8%)
Severe (disabling; can't perform duties)	91 (14.4%)
Critical (life threatening)	14 (2.2%)

Figure 1

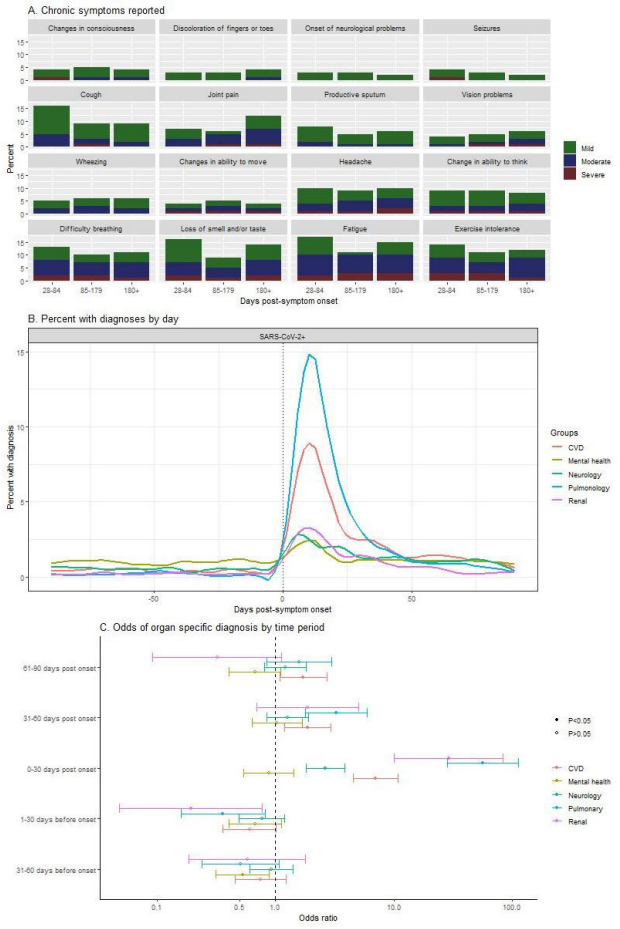

Fig1A. Symptoms reported by EPICC participants with illnesses longer than 28 days; 1B. Percent of participants with organ system specific diagnoses on each day, 90 days pre- and post-symptom onset; 1C. Odds of organ system specific diagnoses within each month, +/- 3 months of symptom onset, were calculated using generalized linear models, controlling for age, sex, and race and included participants as a random effect. Odds shown are relative to the earliest period included in the model, 61-90 days before onset.

Conclusion. In this MHS cohort, a significant proportion of participants had persistent symptoms and cardiovascular disease diagnoses 3 months after COVID-19 illness onset. These findings emphasize the long-term morbidity of COVID-19 and the importance of mitigating SARS-CoV-2 infections. Further analyses will evaluate demographic, clinical, and biomarker predictors of medium-to-long term organ-specific post-acute sequelae.

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35. Health-related quality of life in COVID-19 survivors after 12 months, a prospective cohort study.

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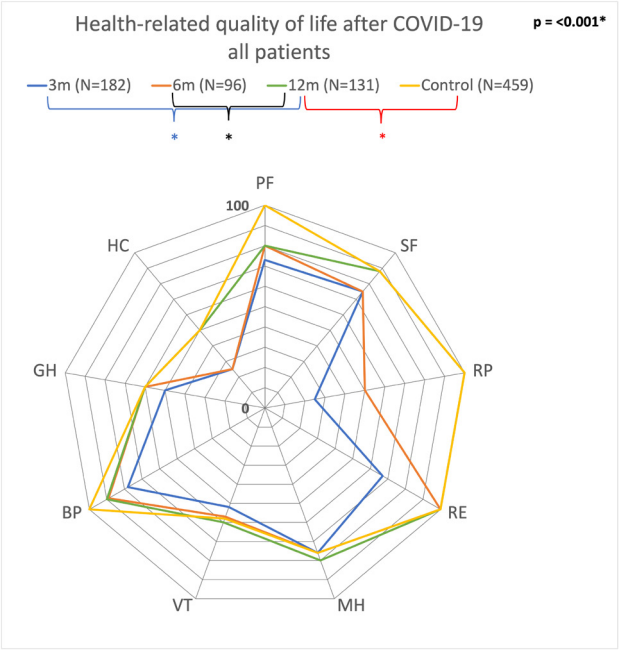
Background. The long-term effects of COVID-19 are still unknown. This study aims to assess the impact of COVID-19 among survivors after one year.

Methods. All confirmed COVID-19 cases who presented at OLVG hospital in Amsterdam during the first wave of the COVID-19 pandemic were invited to participate in our prospective observational cohort study. The participants were divided into three subgroups: patients not admitted, admitted to the general ward and admitted to the ICU. Questionnaires were sent at 3, 6 and 12 months after presentation. We used the Research and Development – 36-item health survey, the Hospital Anxiety and Depression Scale and the PTSS Checklist for DSM-5. We compared the RAND-36 scores at the timepoints with a Dutch healthy control population in 2020 and between the three subgroups using the Kruskal-Wallis test and the Mann-Whitney U test.

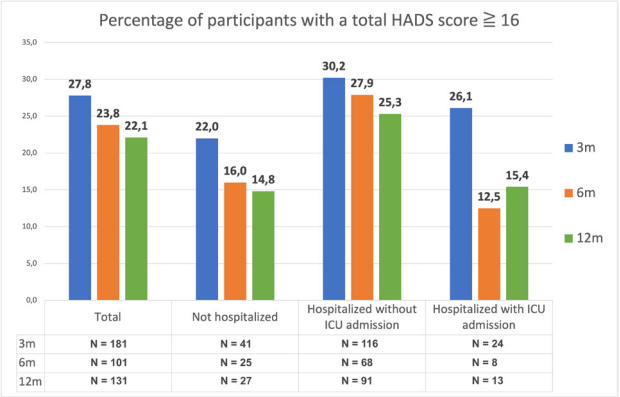
Results. Of the 466 confirmed cases, 75 patients died of COVID-19, 64 patients were lost to follow up and 12 patients were excluded because they were unable to complete the questionnaires due to mental illness or cognitive impairment, they moved back to their home country or refused to participate. Of the remaining 315 patients, 182 (57.8%) completed the questionnaires at 3 months. Subsequently, 163 patients provided informed consent for follow up. At 6 and 12 months, 98 (60.1%) and 131 (80.4%) completed the survey. The average score of all domains at 3 months was 58, compared to 79 at twelve months and 81 in the control group. There was a statistically significant increase from 3 and 12 and 6 and 12 months (figure 1). At twelve months participants recovered to levels of the healthy control group (N=459), except for the ICU group, who still experienced bodily pain and decreased physical function. The improvement was most noticeable in the domains of social functioning, role limitations – physical and role limitations – emotional. The percentage of patients with abnormal total HADS scores (cutoff at 16) and PCL5- scores (cutoff at 33) at 3 months decreased from 27.8 to 22.1% and 18.9 to 7.6% at 12 months, respectively (figure 2 and 3).

Figure 1. RAND-36: Health-related quality of life after COVID-19 of all patients.



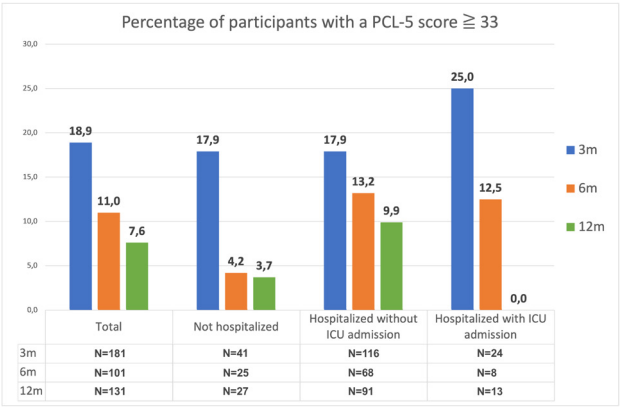
Blue line is after 3 months, orange line is after 6 months, green line is after 12 months, yellow line is healthy control. The p-value in the right-upper corner shows statistical significant difference between all total scores, the asterisks indicate significance between groups. PF = physical functioning; SF = social functioning; RP = role limitations–physical; RE = role limitations–emotional; MH = mental health; VT = vitality; BP = pain; GH = general health; HC = health change.

Figure 2



The blue column is after 3 months, the orange after 6 months and the green after 12 months. The numbers above the columns are percentages per group.

Figure 3



The blue column is after 3 months, the orange after 6 months and the green after 12 months. The numbers above the columns are percentages per group.

Conclusion. Although, COVID-19 may cause a decreased health-related quality of life and impaired mental health, this study shows important recovery up to normal levels after one year.

Disclosures. **All Authors**: No reported disclosures

36. Clinical Features of and Risk Factors for 30-day Readmission after an Initial Hospitalization with COVID-19

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Background. Little is known about risk factors for readmission after COVID-19 hospitalizations. Knowledge of these factors may help to identify patients at increased risk and may help to prevent these rehospitalizations.

Methods. This historical cohort study was conducted at a tertiary care academic medical center. We included COVID-19 cases diagnosed by reverse-transcriptase polymerase-chain-reaction (RT-PCR) assay between March 8th and June 14th, 2020. Patients readmitted within 30 days were identified. Using the electronic medical record, we collected data on demographic and clinical information. Data were analyzed using Student's t-test, the chi-squared test and multivariable logistic regression.

Results. We included 391 patients who survived after the index hospitalization for COVID-19. The readmission rate was 13.3% (52/391). The mean time to readmission was 9.2 ± 7.9 days. The mean age (±SD) was 66.3 ± 18.6 years, 44.2% were male, and 78.8% were black/African-American. The most common presenting complaint was shortness of breath (50%). The most frequent diagnosis during the readmission was infectious process (57.7%). The mortality rate on readmission was 11.5%. Patients with a 30-day readmission were older than those not readmitted, mean age (±SD) 66.3 ± 18.6 vs. 61.0 ± 16.0, respectively (p=0.03). Readmitted patients also had a higher prevalence of heart failure and renal disease as comorbidities. Elevated alanine aminotransferase (AST) and low albumin level were also associated with readmission (Table 1). Intensive care unit (ICU) admission or mechanical ventilation during the index admission did not increase the risk of readmission. From multivariable analysis, independent predictors of 30-day readmission were higher Charlson score (p=0.004), higher creatinine on admission in the index hospitalization (p=0.009), and presence of rhabdomyolysis during the index hospitalization (p=0.039) (Table 2).

Table 1. Univariable Analysis of Predictors for Readmission within 30 days from COVID-19 Infection

Characteristics	No readmission (n=339) (%)	Readmission within 30 d (n=52) (%)	OR (95% CI)	p value
Mean Age	61.0 ± 16.0	66.3 ± 18.6		0.03
Sex, n (%)				
Female	169 (49.9)	29 (55.8)	0.8 (0.4, 1.4)	0.43
Male	170 (501)	23 (44.2)		
Race, n (%)				
White	62 (18.4)	11 (21.2)		--
Black	267 (79.2)	41 (78.8)		
Other	8 (2.4)	0 (0)		
Admission source, n (%)				
Home	263 (77.6)	33 (63.5)	2.0 (1.1, 3.7)	0.03
Facility	76 (22.4)	19 (36.5)		
Insurance type, n (%)				
Commercial	109 (32.2)	6 (11.5)	3.6 (1.5, 8.8)	0.002
Public	230 (67.8)	46 (88.5)		
Comorbidities, n (%)				
≥ one comorbidity	316 (93.2)	52 (100)	1.2 (1.1, 1.2)	--
Congestive heart failure	33 (9.7)	13 (25.0)	3.1 (1.5, 6.4)	0.001
Renal disease	44 (13.0)	19 (36.5)	3.8 (2.0, 7.3)	<0.0001
Laboratory Findings on admission, n (%)				
Elevated AST (>40 U/L)	175 (54.5)	16 (34.8)	0.5 (0.2, 0.9)	0.01
Elevated ALT (>40 U/L)	118 (36.1)	12 (24.0)	0.6 (0.3, 1.1)	0.09
Elevated creatinine from baseline	113 (34.2)	19 (39.6)	1.3 (0.7, 2.3)	0.47
Low serum albumin (<3.5 gm/dl)	119 (36.4)	27 (51.9)	1.9 (1.0, 3.4)	0.03
Rhabdomyolysis	8 (2.4)	4 (7.7)	3.4 (1.0, 11.7)	0.04

Abbreviations: n: Number, OR: Odds ratio, CI: Confidence interval, AST: Aspartate aminotransferase, ALT: Alanine aminotransferase