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Supplementary appendix

This appendix formed part of the original submission and has been peer reviewed. We post it as supplied by the authors.

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Outcomes with and without outpatient SARS-CoV-2 treatment for patients with COVID-19 and systemic autoimmune rheumatic diseases: A retrospective cohort study

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Supplemental Table S11. Severe COVID-19 outcomes by outpatient treatment among SARD patients (n=704), eliminating outcomes adjudicated to be unrelated to COVID-19.

Supplemental Table S12. Odds ratios for severe COVID-19 (hospitalization or death) by outpatient treatment status, eliminating outcomes adjudicated to be unrelated to COVID-19.

Supplemental Table S13. Baseline characteristics stratified by COVID-19 rebound among users of nirmatrelvir/ritonavir (n=311).

Supplemental Table S1. Rheumatic disease terms used to identify patients with systemic rheumatic disease and their associated ICD-10 codes.

Category	Rheumatic Disease (ICD-10 codes)
Inflammatory arthritis	● Rheumatoid arthritis (M05%, M06%) ● Inflammatory arthritis or inflammatory polyarthropathy (M06.4) ● Juvenile idiopathic arthritis (M08.20) ● Psoriatic arthritis or arthropathic psoriasis (L40.50) ● Ankylosing spondylitis (M45.9)
Vasculitis	● Anti-neutrophil cytoplasmic antibody-associated vasculitis: granulomatosis with polyangiitis, eosinophilic granulomatosis with polyangiitis, microscopic polyangiitis (M31.3, M31.7, M30.0) ● Kawasaki disease (M30.3) ● Takayasu arteritis (M31.4) ● Polyarteritis nodosa (M30.0) ● Giant cell arteritis (M31.6) ● Polymyalgia rheumatica (M35.3) ● Behçet disease (M35.2) ● Unspecified arteritis (I77.6)
Other Systemic Autoimmune Diseases	● Systemic lupus erythematosus (M32%) ● Sjogren's syndrome (M35.0) ● Idiopathic inflammatory myositis: dermatomyositis, polymyositis, statin-associated autoimmune myositis, unspecified myositis (G72.49, G72.41, M33) ● Systemic sclerosis (M34.0, M34.1, M34.8%, M34.9) ● Mixed connective tissue disease (M35.1) ● Antiphospholipid syndrome (D68.61)

ICD = international classification of disease, 10th revision codes. % indicates a wild character to capture all instances of a given code.

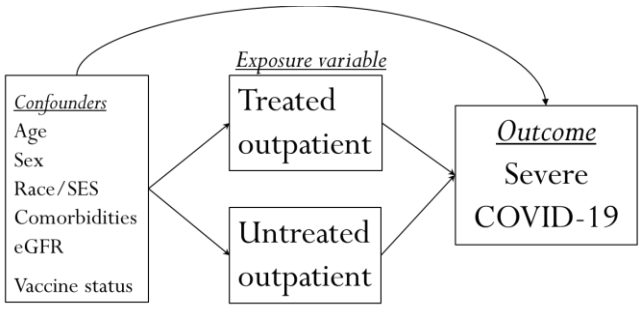
Supplemental Table S2. Immunomodulatory medications used to identify patients with systemic rheumatic disease.

Category and generic name	Brand name(s)	Mechanism of action (for targeted therapy)	Route	CPT code if intravenous
Glucocorticoids				
Prednisone (minimum of 30 pills)	Deltasone Prednicot Prednisone Intensol Rayos Sterapred Sterapred DS		Oral	
Methylprednisolone (minimum of 30 pills)	Medrol		Oral	
Conventional Synthetic DMARDs				
Azathioprine	Imuran Azasan		Oral	
Methotrexate	Otrexup Rasuvo Rheumatrex Trexall		Oral or subQ	
Leflunomide	Arava		Oral	
Mycophenolic acid	CellCept		Oral	
Mycophenolate mofetil	Myfortic		Oral	
Sulfasalazine	Azulfidine		Oral	
Hydroxychloroquine	Plaquenil		Oral	
Chloroquine	Aralen		Oral	
Targeted Synthetic DMARDs				
Tofacitinib	Xeljanz	JAK inhibitor	Oral	
Baricitinib	Olumiant	JAK inhibitor	Oral	
Upadacitinib	Rinvoq	JAK inhibitor	Oral	
Biologic DMARDs				
Rituximab	Rituxan Truxima Ruxience	Anti-CD20 monoclonal antibody	IV	J9310 Q5115 Q5119
Ocrelizumab	Ocrevus	Anti-CD20 monoclonal antibody	IV	J2350
Abatacept	Orencia	CTLA-4 Ig	subQ or IV	J0129
Infliximab	Remicade Inflectra Renflexis Avsola	TNF inhibitor	IV	J1745 Q5103 Q5104 Q5121
Etanercept	Enbrel	TNF inhibitor	subQ	
Adalimumab	Humira	TNF inhibitor	subQ	
Certolizumab	Cimzia	TNF inhibitor	subQ or IV	J0717
Golimumab	Simponi	TNF inhibitor	subQ or IV	J1602
Anakinra	Kineret	IL-1 inhibitor	subQ or IV	n/a (coded under “other biologic” J3490 or J3590 but

				doesn't seem to have its own)
Canakinumab	Ilaris	IL-1 inhibitor	subQ or IV	J0638
Mepolizumab	Nucala	IL-5 inhibitor	subQ or IV	J2182
Benralizumab	Fasenra	IL-5 inhibitor	subQ or IV	J0517
Tocilizumab	Actemra	IL-6 inhibitor	subQ or IV	J3262
Sarilumab	Kevzara	IL-6 inhibitor	subQ	
Secukinumab	Cosentyx	IL-17A inhibitor	subQ	
Ixekizumab	Taltz	IL-17A inhibitor	subQ	
Ustekinumab	Stelara	IL-12/23 inhibitor	subQ or IV	J3358
Guselkumab	Tremfya	IL-23 inhibitor	subQ	
Belimumab	Benlysta	BLyS inhibitor	subQ or IV	J0490
Eculizumab	Soliris	C5 inhibitor	IV	J1300
Other				
Tacrolimus	Prograf Envarsus Astagraf Hecoria		Oral or IV	J7525
Cyclosporine	Gengraf Neoral Sandimmune		Oral or IV	J7516
Apremilast	Otezla	PDE4 inhibitor	Oral	
Cyclophosphamide	Cytoxan		Oral or IV	J9070

CPT, Current Procedural Terminology; CTLA-4, cytotoxic T-lymphocyte-associated protein 4; DMARD, disease-modifying anti-rheumatic drug; IL, interleukin; JAK, Janus kinase; PDE, phosphodiesterase; TNF, tumor necrosis factor

Supplemental Figure S1. Directed acyclic graph depicting exposure variable, confounding variables, and primary outcome. Note that there were too few unvaccinated patients to include as a covariate in multivariable models. eGFR, estimated glomerular filtration rate; COVID-19, coronavirus disease 2019; SES, socioeconomic status.



Supplemental Table S3. Baseline characteristics for SARD patients at COVID-19 onset among molnupiravir, outpatient remdesivir, or combination users.

Characteristic	Molnupiravir use (n=5)	Outpatient remdesivir use (n=3)	Combination use (n=6)
Demographics			
Age (mean, SD, years)	68.26 (9.7)	65.78 (17.4)	55.78 (6.8)
Female	4 (80.0%)	3 (100.0%)	6 (100.0%)
Race			
White	5 (100.0%)	3 (100.0%)	5 (83.3%)
Black or African American	0 (0.0%)	0 (0.0%)	0 (0.0%)
Asian	0 (0.0%)	0 (0.0%)	1 (16.7%)
Hispanic or Latinx ethnicity	0 (0.0%)	0 (0.0%)	0 (0.0%)
Lifestyle			
Body mass index (mean, SD, kg/m^2)	30.00 (6.2)	30.14 (7.2)	33.51 (13.8)
Smoking status			
Never	2 (40.0%)	2 (66.7%)	4 (66.7%)
Past	3 (60.0%)	1 (33.3%)	2 (33.3%)
Current	0 (0.0%)	0 (0.0%)	0 (0.0%)
Comorbidities			
Charlson Comorbidity Index categories			
0	1 (20.0%)	0 (0.0%)	0 (0.0%)
1	1 (20.0%)	1 (33.3%)	2 (33.3%)
2	1 (20.0%)	0 (0.0%)	1 (16.7%)
≥3	2 (40.0%)	2 (66.7%)	3 (50.0%)
Individual comorbidities			
Hypertension	3 (60.0%)	2 (66.7%)	2 (33.3%)
Diabetes	1 (20.0%)	2 (66.7%)	2 (33.3%)
Coronary artery disease	2 (40.0%)	0 (0.0%)	2 (33.3%)
Heart failure	2 (40.0%)	1 (33.3%)	0 (0.0%)
Asthma	0 (0.0%)	1 (33.3%)	2 (33.3%)
Chronic obstructive pulmonary disease	1 (20.0%)	0 (0.0%)	0 (0.0%)
Obstructive sleep apnea	0 (0.0%)	2 (66.7%)	2 (33.3%)
Chronic kidney disease	0 (0.0%)	1 (33.3%)	2 (33.3%)
Malignancy excluding non-melanoma skin cancer	1 (20.0%)	0 (0.0%)	1 (16.7%)
Interstitial lung disease	0 (0.0%)	0 (0.0%)	0 (0.0%)
Rheumatic disease diagnosis			
Rheumatoid arthritis	1 (20.0%)	0 (0.0%)	3 (50.0%)
Psoriatic arthritis	1 (20.0%)	0 (0.0%)	0 (0.0%)
Giant cell arteritis and/or polymyalgia rheumatica	0 (0.0%)	1 (33.3%)	0 (0.0%)
Systemic lupus erythematosus	1 (20.0%)	1 (33.3%)	2 (33.3%)
ANCA-associated vasculitis and other miscellaneous vasculitis	0 (0.0%)	0 (0.0%)	1 (16.7%)
Axial spondyloarthritis	1 (20.0%)	0 (0.0%)	0 (0.0%)
Mixed connective tissue disease	1 (20.0%)	0 (0.0%)	0 (0.0%)
Immunomodulatory medications			
Oral glucocorticoid	0 (0.0%)	0 (0.0%)	0 (0.0%)
Biologic DMARDs			

Anti-CD20 monoclonal antibody	0 (0.0%)	0 (0.0%)	3 (50.0%)
TNF inhibitor	3 (60.0%)	0 (0.0%)	0 (0.0%)
IL-6 receptor inhibitor	0 (0.0%)	1 (33.3%)	1 (16.7%)
Conventional synthetic DMARDs			
Hydroxychloroquine	2 (40.0%)	2 (66.7%)	3 (50.0 %)
Mycophenolate mofetil/mycophenolic acid	0 (0.0%)	0 (0.0%)	1 (16.7%)
Leflunomide	0 (0.0%)	0 (0.0%)	1 (16.7%)
Azathioprine	0 (0.0%)	0 (0.0%)	1 (16.7%)
Cyclosporine	1 (20.0%)	0 (0.0%)	0 (0.0%)
Tacrolimus	0 (0.0%)	0 (0.0%)	1 (16.7%)
Previous COVID-19 immunity			
Vaccination status			
Unvaccinated	0 (0.0%)	0 (0.0%)	0 (0.0%)
Partially vaccinated	0 (0.0%)	0 (0.0%)	0 (0.0%)
2 doses mRNA or 1 dose J&J	1 (20.0%)	0 (0.0%)	1 (16.7%)
Additional doses	4 (80.0%)	3 (100.0%)	5 (83.3%)
Tixagevimab/cilgavimab use	0 (0.0%)	0 (0.0%)	1 (16.7%)
Previous COVID-19 infection	0 (0.0%)	0 (0.0%)	0 (0.0%)

COVID-19, coronavirus disease 2019; eGFR, estimated glomerular filtration rate; IQR, interquartile range; SARD, systemic autoimmune rhematic disease; SD, standard deviation.

Supplemental Table S4. Rate ratios for severe COVID-19 (hospitalization or death) by outpatient SARS-CoV-2 treatment status (alternative analysis to guard against possible sparse-data bias.

Comparisons (reference=second group listed)	Unadjusted RR (95%CI)	Multivariable model 1* RR (95%CI)	Multivariable model 2* (RR (95%CI)
Primary analysis			
Any outpatient treatment vs. no outpatient treatment	0.12 (0.06, 0.24)	0.16 (0.08, 0.32)	0.17 (0.08, 0.35)
Secondary analyses			
Nirmatrelvir/ritonavir vs. no outpatient treatment	0.07 (0.03, 0.20)	0.11 (0.04, 0.29)	0.11 (0.04, 0.32)
Monoclonal antibodies vs. no outpatient treatment	0.27 (0.11, 0.66)	0.28 (0.12, 0.68)	0.29 (0.12, 0.70)
Nirmatrelvir/ritonavir vs. all others	0.10 (0.04, 0.26)	0.14 (0.05, 0.38)	0.15 (0.05, 0.41)
Monoclonal antibodies vs. all others	0.54 (0.22, 1.31)	0.47 (0.20, 1.12)	0.47 (0.20, 1.12)
Nirmatrelvir/ritonavir vs. monoclonal antibodies	0.27 (0.07, 1.00)	0.48 (0.12, 1.87)	0.47 (0.14, 1.58)

*Model 1 was adjusted for continuous age, continuous Charlson Comorbidity Index, continuous estimated glomerular filtration rate, and race.
*Model 2 was adjusted for the covariates listed in Model 1 and Zip code-level median household income.

CI, confidence interval; COVID-19, coronavirus disease 2019; RR, rate ratio; SARS-CoV-2, severe acute respiratory syndrome coronavirus 2.

Supplemental Table S5. Rate ratios for severe COVID-19 (hospitalization or death) of subgroups with original point estimates of ORs ≤0.10 (alternative analysis to guard against possible sparse-data bias.

Comparisons and subgroup (reference=second group listed)	Unadjusted RR (95%CI)	Multivariable model 1* RR (95%CI)	Multivariable model 2* (RR (95%CI)
Any outpatient treatment vs. no outpatient treatment			
Age < 65	0.05 (0.01, 0.21)	0.06 (0.02, 0.26)	0.07 (0.02, 0.30)
Vaccination Status: 2 mRNA or 1 J&J	0.13 (0.03, 0.56)	0.21 (0.05, 0.85)	0.21 (0.06, 0.72)
Duration since last vaccine dose: > 6 months	0.10 (0.03, 0.33)	0.13 (0.04, 0.45)	0.13 (0.04, 0.40)
Nirmatrelvir/ritonavir vs. no outpatient treatment			
Age < 65	0.07 (0.02, 0.28)	0.09 (0.02, 0.37)	0.11 (0.03, 0.44)
Female	0.05 (0.01, 0.20)	0.07 (0.02, 0.29)	0.08 (0.02, 0.32)
CCI >= 2	0.06 (0.02, 0.25)	0.08 (0.02, 0.33)	0.08 (0.02, 0.34)
eGFR >= 30	0.08 (0.03, 0.22)	0.11 (0.04, 0.29)	0.12 (0.04, 0.32)
Vaccination Status: 2 mRNA or 1 J&J	0.09 (0.01, 0.66)	0.13 (0.02, 0.76)	0.13 (0.03, 0.66)
Vaccination Status: Additional Doses	0.07 (0.02, 0.24)	0.11 (0.03, 0.35)	0.12 (0.04, 0.40)
Duration since last vaccine dose: > 6 months	0.05 (0.01, 0.34)	0.06 (0.01, 0.38)	0.06 (0.01, 0.34)

*Model 1 was adjusted for continuous age, continuous Charlson Comorbidity Index, continuous estimated glomerular filtration rate, and race.
*Model 2 was adjusted for the covariates listed in Model 1 and Zip code-level median household income.

CI, confidence interval; COVID-19, coronavirus disease 2019; RR, rate ratio; SARS-CoV-2, severe acute respiratory syndrome coronavirus 2.

Supplemental Table S6. Odds ratios for severe COVID-19 (hospitalization or death) by outpatient SARS-CoV-2 treatment status among subgroups of patients with rheumatoid arthritis, methotrexate users, and hydroxychloroquine users.

Comparisons (reference=second group listed)	**Unadjusted OR for severe COVID-19 (95%CI)**	**Multivariable* OR for severe COVID-19 (95%CI)**
Primary analysis: Any outpatient treatment vs. no outpatient treatment		
Subgroup: Rheumatoid arthritis patients (n=347)	0.12 (0.04, 0.35)	0.14 (0.04, 0.44)
Subgroup: Methotrexate users (n=232)	0.08 (0.02, 0.38)	0.13 (0.03, 0.60)
Subgroup: Hydroxychloroquine users (n=214)	0.06 (0.01, 0.43)	0.06 (0.01, 0.48)

*Adjusted for continuous age, continuous Charlson Comorbidity Index, continuous estimated glomerular filtration rate, and race.

CI, confidence interval; COVID-19, coronavirus disease 2019; OR, odds ratio; SARS-CoV-2, severe acute respiratory syndrome coronavirus 2.

Supplemental Table S7. Severe COVID-19 outcomes by outpatient treatment among SARD patients (n=704), only considering outcomes that occur at least one day after initial positive SARS-CoV-2 test.

Outcome	All Rheumatic Disease Patients with COVID-19 (n=704)	No outpatient treatment (n=278)	Any treatment (n=426)	Nirmatrelvir/ ritonavir use (n=307)	Monoclonal antibody use (n=105)
Hospitalization	38 (5.4%)	29 (10.4%)	9 (2.1%)	4 (1.3%)	5 (4.8%)
Death	3 (0.4%)	2 (0.7%)	1 (0.2%)	1 (0.3%)	0 (0.0%)
Severe COVID-19 (hospitalization or death)	39 (5.5%)	30 (10.8%)	9 (2.1%)	4 (1.3%)	5 (4.8%)

*There were no severe COVID-19 outcomes among molnupiravir (n=5), remdesivir (n=3), or combination (n=6; 4 received nirmatrelvir/ritonavir and monoclonal antibodies and 2 received molnupiravir and monoclonal antibodies) users.

COVID-19, coronavirus disease 2019; SARD, systemic autoimmune rheumatic disease; SARS-CoV-2, severe acute respiratory syndrome coronavirus 2.

Supplemental Table S8. Odds ratios for severe COVID-19 (hospitalization or death) by outpatient treatment status, only considering outcomes that occur at least one day after initial positive SARS-CoV-2 test.

Comparisons (reference=second group listed)	Unadjusted OR for severe COVID-19 (95%CI)	Multivariable* OR for severe COVID-19 (95%CI)
Primary analysis		
Any outpatient treatment vs. no outpatient treatment	0.18 (0.08, 0.38)	0.22 (0.10, 0.48)
Secondary analyses		
Nirmatrelvir/ritonavir vs. no outpatient treatment	0.11 (0.04, 0.31)	0.15 (0.05, 0.43)
Monoclonal antibodies vs. no outpatient treatment	0.41 (0.16, 1.10)	0.41 (0.15, 1.11)
Nirmatrelvir/ritonavir vs. all others	0.14 (0.05, 0.39)	0.19 (0.06, 0.54)
Monoclonal antibodies vs. all others	0.83 (0.32, 2.18)	0.67 (0.24, 1.83)
Nirmatrelvir/ritonavir vs. monoclonal antibodies	0.26 (0.07, 1.00)	0.46 (0.11, 1.97)

*Adjusted for continuous age, continuous Charlson Comorbidity Index, continuous estimated glomerular filtration rate, and race.

CI, confidence interval; COVID-19, coronavirus disease 2019; OR, odds ratio; SARS-CoV-2, severe acute respiratory syndrome coronavirus 2.

Supplemental Table S9. Severe COVID-19 outcomes by outpatient treatment among SARD patients (n=704), only considering outcomes that occur at least one day after initial positive SARS-CoV-2 test to day 14.

Outcome	All Rheumatic Disease Patients with COVID-19 (n=704)	No outpatient treatment (n=278)	Any treatment (n=426)	Nirmatrelvir/ ritonavir use (n=307)	Monoclonal antibody use (n=105)
Hospitalization	34 (4.8%)	25 (9.0%)	9 (2.1%)	4 (1.3%)	5 (4.8%)
Death	1 (0.1%)	1 (0.4%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Severe COVID-19 (hospitalization or death)	34 (4.8%)	25 (9.0%)	9 (2.1%)	4 (1.3%)	5 (4.8%)

*There were no severe COVID-19 outcomes among molnupiravir (n=5), remdesivir (n=3), or combination (n=6; 4 received nirmatrelvir/ritonavir and monoclonal antibodies and 2 received molnupiravir and monoclonal antibodies) users.

COVID-19, coronavirus disease 2019; SARD, systemic autoimmune rheumatic disease; SARS-CoV-2, severe acute respiratory syndrome coronavirus 2.

Supplemental Table S10. Odds ratios for severe COVID-19 (hospitalization or death) by outpatient treatment status, only considering outcomes that occur at least one day after initial positive SARS-CoV-2 test to day 14.

Comparisons (reference=second group listed)	Unadjusted OR for severe COVID-19 (95%CI)	Multivariable* OR for severe COVID-19 (95%CI)
Primary analysis		
Any outpatient treatment vs. no outpatient treatment	0.22 (0.10, 0.48)	0.28 (0.12, 0.62)
Secondary analyses		
Nirmatrelvir/ritonavir vs. no outpatient treatment	0.13 (0.05, 0.39)	0.18 (0.06, 0.55)
Monoclonal antibodies vs. no outpatient treatment	0.51 (0.19, 1.36)	0.51 (0.19, 1.42)
Nirmatrelvir/ritonavir vs. all others	0.16 (0.06, 0.46)	0.22 (0.08, 0.66)
Monoclonal antibodies vs. all others	0.98 (0.37, 2.60)	0.82 (0.30, 2.25)
Nirmatrelvir/ritonavir vs. monoclonal antibodies	0.26 (0.07, 1.00)	0.46 (0.11, 1.97)

*Adjusted for continuous age, continuous Charlson Comorbidity Index, continuous estimated glomerular filtration rate, and race.

CI, confidence interval; COVID-19, coronavirus disease 2019; OR, odds ratio; SARS-CoV-2, severe acute respiratory syndrome coronavirus 2.

Supplemental Table S11. Severe COVID-19 outcomes by outpatient treatment among SARD patients (n=704), eliminating outcomes adjudicated to be unrelated to COVID-19.

Outcome	All Rheumatic Disease Patients with COVID-19 (n=704)	No outpatient treatment (n=278)	Any treatment (n=426)	Nirmatrelvir/ ritonavir use (n=307)	Monoclonal antibody use (n=105)
Hospitalization	46 (6.5%)	39 (14.0%)	7 (1.6%)	4 (1.3%)	3 (2.9%)
Death	2 (0.3%)	1 (0.4%)	1 (0.2%)	1 (0.3%)	0 (0.0%)
Severe COVID-19 (hospitalization or death)	46 (6.5%)	39 (14.0%)	7 (1.6%)	4 (1.3%)	3 (2.9%)

*There were no severe COVID-19 outcomes among molnupiravir (n=5), remdesivir (n=3), or combination (n=6; 4 received nirmatrelvir/ritonavir and monoclonal antibodies and 2 received molnupiravir and monoclonal antibodies) users.

COVID-19, coronavirus disease 2019; SARD, systemic autoimmune rheumatic disease; SARS-CoV-2, severe acute respiratory syndrome coronavirus 2.

Supplemental Table S12. Odds ratios for severe COVID-19 (hospitalization or death) by outpatient treatment status, eliminating outcomes adjudicated to be unrelated to COVID-19.

Comparisons (reference=second group listed)	Unadjusted OR for severe COVID-19 (95%CI)	Multivariable* OR for severe COVID-19 (95%CI)
Primary analysis		
Any outpatient treatment vs. no outpatient treatment	0.10 (0.05, 0.23)	0.13 (0.05, 0.29)
Secondary analyses		
Nirmatrelvir/ritonavir vs. no outpatient treatment	0.08 (0.03, 0.23)	0.12 (0.04, 0.34)
Monoclonal antibodies vs. no outpatient treatment	0.18 (0.05, 0.60)	0.16 (0.05, 0.55)
Nirmatrelvir/ritonavir vs. all others	0.11 (0.04, 0.32)	0.17 (0.06, 0.49)
Monoclonal antibodies vs. all others	0.38 (0.12, 1.25)	0.26 (0.08, 0.92)
Nirmatrelvir/ritonavir vs. monoclonal antibodies	0.45 (0.10, 2.04)	0.93 (0.18, 4.97)

*Adjusted for continuous age, continuous Charlson Comorbidity Index, continuous estimated glomerular filtration rate, and race.

CI, confidence interval; COVID-19, coronavirus disease 2019; OR, odds ratio; SARS-CoV-2, severe acute respiratory syndrome coronavirus 2.

Supplemental Table S13. Baseline characteristics stratified by COVID-19 rebound among users of nirmatrelvir/ritonavir (n=311).

Characteristic	Nirmatrelvir/ ritonavir use and documented rebound (n=24)	Nirmatrelvir/ ritonavir use and no documented rebound (n=287)
Demographics		
Mean age (SD), years	54.29 (13.4)	57.32 (15.0)
Female	20 (83.3%)	219 (76.3%)
Race		
White	20 (83.3%)	242 (84.3%)
Black or African American	0 (0.0%)	15 (5.2%)
Asian	2 (8.3%)	8 (2.8%)
Other (Two or more)	2 (8.3%)	14 (4.9%)
Unknown	0 (0.0%)	8 (2.8%)
Hispanic or Latinx ethnicity	0 (0.0%)	4 (1.4%)
Lifestyle		
Body mass index (mean, SD, kg/m^2)	24.72 (7.3)	28.13 (7.4)
Categorical BMI		
<18.5 (underweight)	0 (0.0%)	9 (3.1%)
18.5 to <25 (normal)	11 (45.8%)	94 (32.8%)
25 to <30 (overweight)	8 (33.3%)	84 (29.3%)
≥30 (obese)	4 (16.7%)	97 (33.8%)
Missing	1 (4.2%)	3 (1.1%)
Smoking status		
Never	16 (66.7%)	189 (65.9%)
Past	7 (29.2%)	86 (30.0%)
Current	0 (0.0%)	9 (3.1%)
Unknown	1 (4.2%)	3 (1.1%)
Comorbidities		
Median Charlson Comorbidity Index (IQR)	1 (1, 3)	1 (1, 2)
0	4 (16.7%)	43 (15.0%)
1	9 (37.5%)	144 (50.2%)
2	4 (16.7%)	47 (16.4%)
≥3	7 (29.2%)	53 (18.5%)
Individual comorbidities		
Hypertension	4 (16.7%)	99 (34.5%)
Diabetes	3 (12.5%)	17 (5.9%)
Coronary artery disease	2 (8.3%)	22 (7.7%)
Heart failure	0 (0.0%)	4 (1.4%)
Asthma	5 (20.8%)	39 (13.6%)
Chronic obstructive pulmonary disease	0 (0.0%)	4 (1.4%)
Obstructive sleep apnea	2 (8.3%)	26 (9.1%)
Chronic kidney disease	5 (20.8%)	23 (8.0%)
Interstitial lung disease	0 (0.0%)	9 (3.1%)
Malignancy excluding non-melanoma skin cancer	1 (4.2%)	34 (11.9%)
Non-melanoma skin cancer	0 (0.0%)	9 (3.1%)
SARD diagnosis		
Rheumatoid arthritis	10 (41.7%)	149 (51.9%)
Psoriatic arthritis	5 (20.8%)	57 (19.9%)

Giant cell arteritis and/or polymyalgia rheumatic	0 (0.0%)	13 (4.5%)
Systemic lupus erythematosus	5 (20.8%)	33 (11.5%)
Sjogren's syndrome	2 (8.3%)	5 (1.7%)
ANCA-associated vasculitis and other miscellaneous vasculitis	0 (0.0%)	9 (3.1%)
Systemic sclerosis	0 (0.0%)	4 (1.4%)
Axial spondyloarthritis	1 (4.2%)	4 (1.4%)
Mixed connective tissue disease	0 (0.0%)	2 (0.7%)
Antiphospholipid antibody syndrome	0 (0.0%)	3 (1.1%)
Behcet disease	1 (4.2%)	2 (0.7%)
Idiopathic inflammatory myositis	0 (0.0%)	0 (0.0%)
Takayasu arteritis	0 (0.0%)	1 (0.4%)
Juvenile idiopathic arthritis	0 (0.0%)	1 (0.4%)
Multiple primary rheumatic diseases	0 (0.0%)	4 (1.4%)
Immunomodulatory medications		
Oral glucocorticoid	0 (0.0%)	6 (2.1%)
Conventional synthetic DMARDs	18 (75.0%)	190 (66.2%)
Hydroxychloroquine	11 (45.8%)	76 (26.5%)
Hydroxychloroquine monotherapy	6 (25.0%)	37 (12.9%)
Methotrexate	4 (16.7%)	102 (35.5%)
Mycophenolate mofetil/mycophenolic acid	0 (0.0%)	14 (4.9%)
Leflunomide	2 (8.3%)	22 (7.7%)
Azathioprine	3 (12.5%)	6 (2.1%)
Sulfasalazine	0 (0.0%)	15 (5.2%)
Apremilast	0 (0.0%)	2 (0.7%)
Cyclophosphamide	0 (0.0%)	4 (1.4%)
Cyclosporine	0 (0.0%)	6 (2.1%)
Tacrolimus	2 (8.3%)	8 (2.8%)
Biologic DMARDs	8 (33.3%)	128 (44.6%)
Anti-CD20 monoclonal antibody	0 (0.0%)	15 (5.2%)
TNF inhibitor	6 (25.0%)	80 (27.9%)
IL-6 receptor inhibitor	0 (0.0%)	11 (3.8%)
B-cell activating factor inhibitor	0 (0.0%)	1 (0.4%)
IL-23 inhibitor	0 (0.0%)	1 (0.4%)
IL-17 inhibitor	2 (8.3%)	11 (3.8%)
IL-12/IL-23 inhibitor	0 (0.0%)	1 (0.4%)
IL-1 inhibitor	0 (0.0%)	1 (0.4%)
CTLA-4 immunoglobulin	0 (0.0%)	8 (2.8%)
Targeted synthetic DMARD		
JAK inhibitor	0 (0.0%)	8 (2.8%)
Previous COVID-19 immunity		
Vaccination status		
Unvaccinated	0 (0.0%)	8 (2.8%)
Partially vaccinated	0 (0.0%)	0 (0.0%)
2 doses mRNA or 1 dose J&J	3 (12.5%)	38 (13.2%)
Additional doses	21 (87.5%)	241 (84.0%)
Tixagevimab/cilgavimab use	0 (0.0%)	6 (2.1%)

Previous COVID-19 infection	0 (0.0%)	8 (2.8%)

ANCA, antineutrophil cytoplasmic antibodies; COVID-19, coronavirus disease 2019; CTLA-4, cytotoxic T-lymphocyte-associated protein 4; DMARDs, disease-modifying antirheumatic drugs; eGFR, estimated glomerular filtration rate; IL, interleukin; IQR, interquartile range; SARD, systemic autoimmune rheumatic disease; SD, standard deviation; TNF, tumor necrosis factor.