

**Supplementary Table S1.** Categorization of underlying chronic illnesses.

Chronic Lung Disease	<ul style="list-style-type: none"> <li>• Asthma</li> <li>• Cystic fibrosis</li> <li>• Chronic obstructive pulmonary disease</li> <li>• Obstructive sleep apnea</li> <li>• Oxygen dependence</li> <li>• Pulmonary fibrosis</li> <li>• Restrictive lung disease</li> <li>• Sarcoidosis</li> </ul>
Chronic Metabolic Disease	<ul style="list-style-type: none"> <li>• Adrenal Disorders</li> <li>• Diabetes mellitus</li> <li>• Glycogen or other storage diseases</li> <li>• Hyper-/Hypo-pituitary function</li> <li>• Hyper/Hypoparathyroidism</li> <li>• Congenital metabolic diseases</li> <li>• Metabolic Syndrome</li> <li>• Thyroid dysfunction</li> </ul>
Hematologic Conditions	<ul style="list-style-type: none"> <li>• Chronic anemia</li> <li>• Coagulopathy or other bleeding disorder</li> <li>• Myelodysplastic syndrome</li> <li>• Polycythemia vera</li> <li>• Sickle cell disease</li> <li>• Thalassemia</li> <li>• Thrombocytopenia</li> </ul>
Cardiovascular Disease	<ul style="list-style-type: none"> <li>• Atherosclerotic cardiovascular disease</li> <li>• Cardiac arrhythmias</li> <li>• Cardiomyopathy</li> <li>• Congenital heart disease</li> <li>• History of aortic aneurysm</li> <li>• History of transient ischemic attack/Stroke</li> <li>• Heart failure</li> <li>• Heart valve disease</li> <li>• Hypertension</li> <li>• Peripheral artery disease</li> <li>• Pulmonary hypertension</li> </ul>
Neurologic Disorders	<ul style="list-style-type: none"> <li>• Amyotrophic lateral sclerosis</li> <li>• Cerebral palsy</li> <li>• Cognitive dysfunction</li> <li>• Dementia/Alzheimer's disease</li> <li>• Developmental delay</li> <li>• Epilepsy</li> <li>• Multiple sclerosis</li> <li>• Muscular dystrophy</li> <li>• Myasthenia gravis</li> <li>• Parkinson's disease</li> <li>• History of brain injury</li> <li>• History of Guillain-Barre syndrome</li> <li>• Paraplegia/Quadriplegia</li> </ul>
Immunocompromising Conditions	<ul style="list-style-type: none"> <li>• Active treatment with immunosuppressive medication</li> <li>• Complement deficiency</li> <li>• Hematologic cancer <sup>1</sup></li> <li>• History of hematopoietic stem cell transplant within 2 years</li> <li>• History of solid organ transplant</li> <li>• History of splenectomy</li> <li>• HIV infection</li> <li>• Immunoglobulin deficiency</li> </ul>

	<ul style="list-style-type: none"> <li>• Solid organ malignancy <sup>1</sup></li> </ul>
Renal Disease	<ul style="list-style-type: none"> <li>• Chronic kidney disease</li> <li>• Dialysis</li> <li>• End stage renal disease</li> <li>• Glomerulonephritis</li> <li>• Nephrotic syndrome</li> <li>• Polycystic kidney disease</li> </ul>
Gastrointestinal/Liver Disease	<ul style="list-style-type: none"> <li>• Alcoholic hepatitis</li> <li>• Autoimmune hepatitis</li> <li>• Barrett's esophagitis</li> <li>• Chronic liver disease</li> <li>• Chronic pancreatitis</li> <li>• Cirrhosis/End stage liver disease</li> <li>• Crohn's disease</li> <li>• Esophageal varices</li> <li>• Hepatitis B, chronic</li> <li>• Hepatitis C, chronic</li> <li>• Non-alcoholic fatty liver disease</li> <li>• Ulcerative colitis</li> </ul>
Rheumatologic/Autoimmune Conditions	<ul style="list-style-type: none"> <li>• Ankylosing spondylitis</li> <li>• Dermatomyositis</li> <li>• Juvenile idiopathic arthritis</li> <li>• Microscopic polyangiitis</li> <li>• Polyarteritis nodosum</li> <li>• Polymyalgia rheumatica</li> <li>• Polymyositis</li> <li>• Psoriatic arthritis</li> <li>• Rheumatoid arthritis</li> <li>• Systemic Lupus Erythematosus</li> <li>• Temporal/Giant Cell arteritis</li> <li>• Vasculitis, other</li> </ul>
Other	<ul style="list-style-type: none"> <li>• Other underlying medical conditions not specified above</li> </ul>

<sup>1</sup> Currently treated or diagnosed in the past 6 months

**Supplementary Table S2.** Association between prior vaccination and progression to critically severe disease including two patients with unresolved status assumed to have progressed to critically severe disease (the World Health Organization COVID-19 Clinical Progression Scale 7–10) [12] and subdistribution hazard ratios for progression to critically severe disease.

Characteristics	Odds ratio (95% CI)	<i>P</i> value	Subdistribution hazard ratio (95% CI)	<i>P</i> value <sup>1</sup>
Intercept	0.11 (0.03–0.37)	<b>&lt;0.001</b>		
Vaccination status (vaccinated vs. unvaccinated)	0.41 (0.24–0.67)	<b>&lt;0.001</b>	0.48 (0.32–0.73)	<b>&lt;0.001</b>
Age	1.01 (0.99–1.03)	0.403	1.01 (0.99–1.03)	0.410
Sex (male vs. female)	1.40 (0.91–2.15)	0.124	1.42 (0.98–2.03)	0.061
Charlson comorbidity index	1.17 (1.01–1.36)	<b>0.039</b>	1.12 (1.02–1.25)	<b>0.024</b>
Immunocompromising condition present (yes vs. no)	1.03 (0.45–2.38)	0.941	1.08 (0.57–2.03)	0.820

CI, confidence interval

<sup>1</sup> *P* value < 0.05 was considered significant (marked in bold).

**Supplementary Table S3.** Cause-specific hazard ratios for discharge from hospital.

Characteristics	Hazard ratio (95% CI)	<i>P</i> value <sup>1</sup>
Vaccination status (vaccinated vs. unvaccinated)	1.37 (1.09–1.70)	<b>0.006</b>
Age	1.00 (0.99–1.01)	0.485
Sex (male vs. female)	0.90 (0.74–1.09)	0.271
Charlson comorbidity index	0.94 (0.86–1.01)	0.107
Immunocompromising condition present (yes vs. no)	0.91 (0.61–1.35)	0.629

CI, confidence interval

<sup>1</sup> *P* value < 0.05 was considered significant (marked in bold).

**Supplementary Figure S1.** Number of patients with PCR-confirmed vaccine breakthrough SARS-CoV-2 infections admitted in relation to time between last vaccine dose and hospital admission in weeks.

