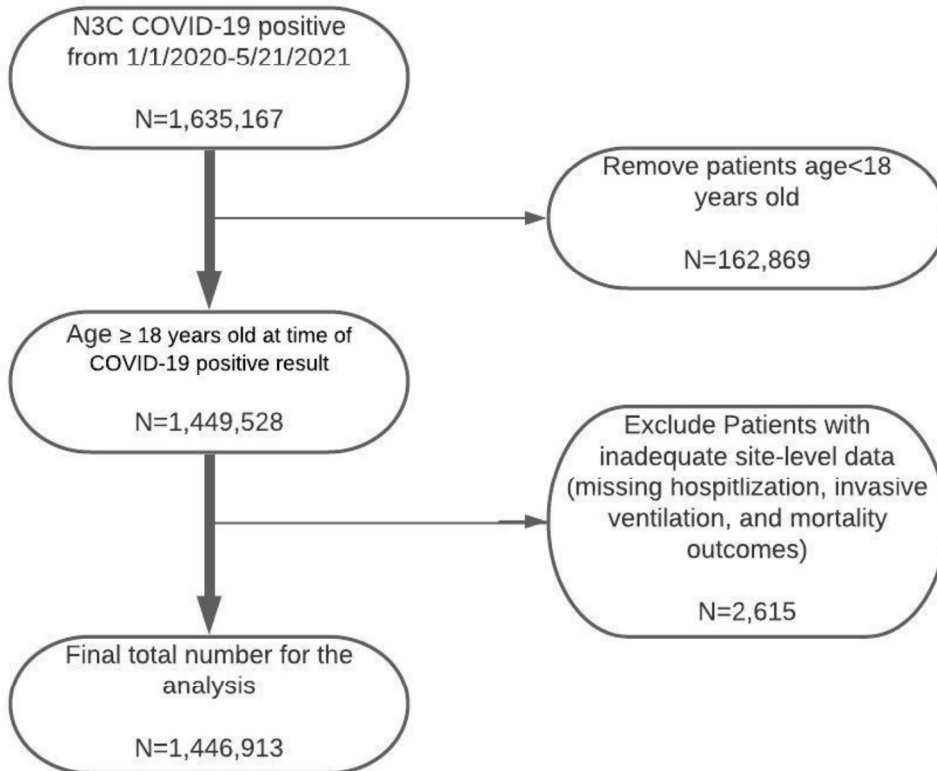


Supplementary Materials

Supplementary Figure 1. Flow Diagram of Study Sample



Supplementary Table S-1. Key Variables and Concept Definitions

Variable	Concepts and Logic
<p>Key Exposures</p> <p>COVID-19 definition</p>	<p><u>Concept Set Names (latest codeset ID) with Description:</u></p> <p>N3C Covid diagnosis (35486128) <i>Description: Corresponds to ICD10CM Code: U07.1 (condition). Includes 1 Concept (Disease caused by 2019-nCoV - Concept Id: 840539006).</i></p> <p>ATLAS SARS-CoV-2 rt-PCR and AG (651620200) <i>Description: Includes 55 Concepts (Measurements), characterizing a positive PCR or Antigen test.</i></p> <p>Atlas #818 [N3C] CovidAntibody retry (45478367) <i>Description: Includes 24 Concepts (Measurements), characterizing a positive Antibody test.</i></p> <p>ResultsPos (400691529) <i>Description: Includes 6 Concepts, collecting all the affirmative measurement results</i></p> <p><u>Logic:</u> Patient record must be associated with a “N3C Covid diagnosis”</p> <p>OR</p> <p>have at least one of the covid measurement concepts (“ATLAS SARS-CoV-2 rt-PCR and AG” or “[N3C CovidAntibody retry”) AND a positive result (“ResultsPos”)</p>
<p>HIV infection</p>	<p><u>Concept Set Names (latest codeset ID):</u></p> <p>HIV drugs (331061593) hiv infection (382527336) cs_isc_hiv_labs_procedures (684826767)</p> <p><u>PrEP Concept IDs and Names:</u></p> <p>35606583 emtricitabine 100 MG / tenofovir disoproxil fumarate 150 MG Oral Tablet [Truvada] 1710316 emtricitabine 200 MG / tenofovir disoproxil fumarate 300 MG Oral Tablet [Truvada] 35606591 emtricitabine 167 MG / tenofovir disoproxil fumarate 250 MG Oral Tablet [Truvada] 35604225 emtricitabine 200 MG / tenofovir alafenamide 25 MG Oral Tablet 35606585 emtricitabine 133 MG / tenofovir disoproxil fumarate 200 MG Oral Tablet 35606581 emtricitabine 100 MG / tenofovir disoproxil fumarate 150 MG Oral Tablet 1703093 emtricitabine 200 MG / tenofovir disoproxil fumarate 300 MG Oral Tablet 35604229 emtricitabine 200 MG / tenofovir alafenamide 25 MG Oral Tablet [Descovy]</p> <p><u>Logic:</u> Included in cohort if patient is associated with at least one of the concept sets listed in either the condition, procedures, or drugs tables. Patients only on PrEP were excluded.</p>
<p>Solid organ transplant definition</p>	<p><u>Concept Set Names (latest codeset ID):</u></p> <p>[N3C] [ISC] Kidney Transplant Rejection (25243076) [N3C] [ISC] Heart Transplant Rejection (610701999) [N3C] [ISC] Liver Transplant Rejection (184979218)</p>

	<p>[N3C] [ISC] Kidney Transplant Failure (562737056) [N3C] [ISC] Lung Transplant Rejection (784946326) [N3C] [ISC] Heart Transplant Failure (708583955) [N3C] [ISC] Liver Transplant Failure (663753516) [N3C] [ISC] Lung Transplant Failure (818309036) [N3C] [ISC] Kidney Transplant (21035617) [N3C] [ISC] Heart Transplant (976928531) [N3C] [ISC] Liver Transplant (204996696) [N3C] [ISC] Lung Transplant (402177099) [N3C] [ISC] Pancreas Transplant (788127890)</p> <p>Logic: All patients associated with at least one of the listed concept sets, including records from the observation, procedure_occurrence, and condition_occurrence tables.</p>
Outcomes	
Emergency Department visit	<p>Visit Concept IDs and Names: 262 Emergency Room and Inpatient Visit 9203 Emergency Room Visit</p> <p>Logic: No concept sets were used in this definition. Includes patients with a visit start date between 14 days prior to the earliest covid diagnosis to 45 days after covid diagnosis that are also associated with one of the listed visit concept IDs.</p>
Hospitalization	<p>Visit Concept IDs and Names: 262 Emergency Room and Inpatient Visit 8717 Inpatient Hospital 9201 Inpatient Visit 581379 Inpatient Critical Care Facility</p> <p>Logic: No concept sets were used in this definition. Includes patients with a visit start date between 14 days prior to the earliest covid diagnosis to 45 days after covid diagnosis that are also associated with one of the listed visit concept IDs.</p>
Invasive ventilation	<p>Concept Set Names (latest codeset ID): Invasive Mechanical Ventilation 2OCT20 (179437741)</p> <p>Logic: Includes patients associated with any procedure codes in the concept sets listed that had a procedure date on or after the earliest covid diagnosis.</p>
ECMO	<p>Concept Set Names (latest codeset ID): Kostka - ECMO (415149730)</p> <p>Logic: Includes patients associated with any procedure codes in the concept sets listed that had a procedure date on or after the earliest covid diagnosis.</p>
Death	<p>Logic:</p>

	No concepts or concept sets were used. Patients were flagged as deceased if a valid entry with a date was included in the death table, which is part of the OMOP data model used in the Enclave.
Comorbid Conditions	
Severe cardiovascular event (Congestive heart failure and myocardial infarction)	<p><u>Concept Set Names (latest codeset ID):</u> Charlson - CHF (359043664) Charlson - MI (259495957)</p> <p><u>Logic:</u> Includes patients associated with any condition codes in the concept sets listed with an occurrence date before the earliest covid diagnosis.</p>
Peripheral vascular diseases	<p><u>Concept Set Names (latest codeset ID):</u> Charlson - PVD (376881697)</p> <p><u>Logic:</u> Includes patients associated with any condition codes in the concept sets listed with an occurrence date before the earliest covid diagnosis.</p>
Stroke	<p><u>Concept Set Names (latest codeset ID):</u> Charlson - Stroke (652711186)</p> <p><u>Logic:</u> Includes patients associated with any condition codes in the concept sets listed with an occurrence date before the earliest covid diagnosis.</p>
Dementia	<p><u>Concept Set Names (latest codeset ID):</u> Charlson - Dementia (78746470)</p> <p><u>Logic:</u> Includes patients associated with any condition codes in the concept sets listed with an occurrence date before the earliest covid diagnosis.</p>
Pulmonary Diseases	<p><u>Concept Set Names (latest codeset ID):</u> Charlson - Pulmonary (514953976)</p> <p><u>Logic:</u> Includes patients associated with any condition codes in the concept sets listed with an occurrence date before the earliest covid diagnosis.</p>
Rheumatic Diseases	<p><u>Concept Set Names (latest codeset ID):</u> Charlson - Rheumatic (765004404)</p> <p><u>Logic:</u> Includes patients associated with any condition codes in the concept sets listed with an occurrence date before the earliest covid diagnosis.</p>
Peptic ulcer diseases	<p><u>Concept Set Names (latest codeset ID):</u> Charlson - PUD (510748896)</p> <p><u>Logic:</u> Includes patients associated with any condition codes in the concept sets listed with an occurrence date before the earliest covid diagnosis.</p>

<p>Liver diseases (mild and severe liver diseases)</p>	<p><u>Concept Set Names (latest codeset ID):</u> Charlson - LiverMild (494981955) Charlson - LiverSevere (248333963)</p> <p><u>Logic:</u> Includes patients associated with any condition codes in the concept sets listed with an occurrence date before the earliest covid diagnosis.</p>
<p>Diabetes mellitus (diabetes mellitus and diabetes mellitus with complications)</p>	<p><u>Concept Set Names (latest codeset ID):</u> Charlson - DM (719585646) Charlson - DMcx (403438288)</p> <p><u>Logic:</u> Includes patients associated with any condition codes in the concept sets listed with an occurrence date before the earliest covid diagnosis.</p>
<p>Renal diseases</p>	<p><u>Concept Set Names (latest codeset ID):</u> Charlson - Renal (220495690)</p> <p><u>Logic:</u> Includes patients associated with any condition codes in the concept sets listed with an occurrence date before the earliest covid diagnosis.</p>
<p>Cancer (metastatic and non-metastatic)</p>	<p><u>Concept Set Names (latest codeset ID):</u> Charlson - Cancer (535274723) Charlson - Mets (378462283)</p> <p><u>Logic:</u> Includes patients associated with any condition codes in the concept sets listed with an occurrence date before the earliest covid diagnosis.</p>

Supplementary Table S-2. Invasive Mechanical Ventilation Use among COVID-19 Patients Admitted to Emergency Department or Hospital by Immunosuppression group.

Immunosuppression group N = 413,292	Crude estimates		Adjusted estimates A		Adjusted estimates B	
	OR (95% CI)	P-value	OR (95% CI)	P-value	OR (95% CI)	P-value
HIV- & SOT- (N = 403,847)	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
PWH (N = 2,611)	1.85 (1.62-2.11)	<0.01	1.66 (1.46-1.90)	<0.01	1.62 (1.42-1.85)	<0.01
SOT (N = 6,671)	3.26 (3.05-3.49)	<0.01	2.86 (2.67-3.07)	<0.01	2.29 (2.13-2.47)	<0.01
HIV+ & SOT+ (N = 163)	3.63 (2.41-5.45)	<0.01	2.88 (1.9-4.36)	<0.01	2.10 (1.38-3.19)	<0.01

Model A adjusted for age, sex, race and ethnicity (Black non-Hispanic, white Hispanic, white non-Hispanic, others), smoking status, and study site.

Model B adjusted for age, sex, race and ethnicity (Black non-Hispanic, white Hispanic, white non-Hispanic, others), smoking status, study site, severe liver disease, diabetes, cancer, renal disease, and number of comorbidities (0, 1, 2, ≥3).

HIV- & SOT-: people without HIV or solid organ transplant; PWH: people with HIV; SOT: solid organ transplant patient; HIV+ & SOT+: PWH had solid organ transplant; OR: odds ratio; 95% CI: 95% confidence interval.

Supplementary Table S-3. Characteristics of People with HIV by Their Laboratory Data Availability

	PWH with CD4 cell count data	PWH with HIV viral load data	all PWH*
N	N = 3,660	N = 1,424	N = 8,537
age, median (IQR)	52 (39-60)	52 (39-60)	50 (37-59)
Age ≥ 60, N (%)	946 (25.8)	385 (27)	2,087 (24.4)
female sex, N (%)	871 (23.8)	307 (21.6)	2361 (27.7)
race and ethnicity, N (%)			
White non-Hispanic	1117 (30.5)	1,117 (30.5)	2982 (34.9)
Black non-Hispanic	1200 (32.8)	405 (28.4)	2830 (33.1)
Hispanic	421 (11.5)	229 (16.1)	681 (9.4)
Others	922 (25.2)	274 (19.2)	1,985 (23.3)
smoking status, N (%)			
current or former	1985 (23.3)	430 (30.2)	2198 (25.7)
non-smoker	2,198 (25.7)	994 (69.8)	6413 (75.1)
unknown	35 (1)	<20	74 (0.9)
number of comorbidities, N (%)			
0	1572 (43)	576 (40.4)	4,269 (50)
1	1,047 (28.6)	442 (31)	2,099 (24.6)
2	533 (14.6)	225 (15.8)	1,077 (12.6)
≥ 3	508 (13.9)	181 (12.7)	1,092 (12.8)

Note: N3C policy does not allow reporting of cells with less than 20 patients, indicated as “<20”.

PWH=people with HIV

*All PWH included people with HIV alone and people with HIV and solid organ transplant.