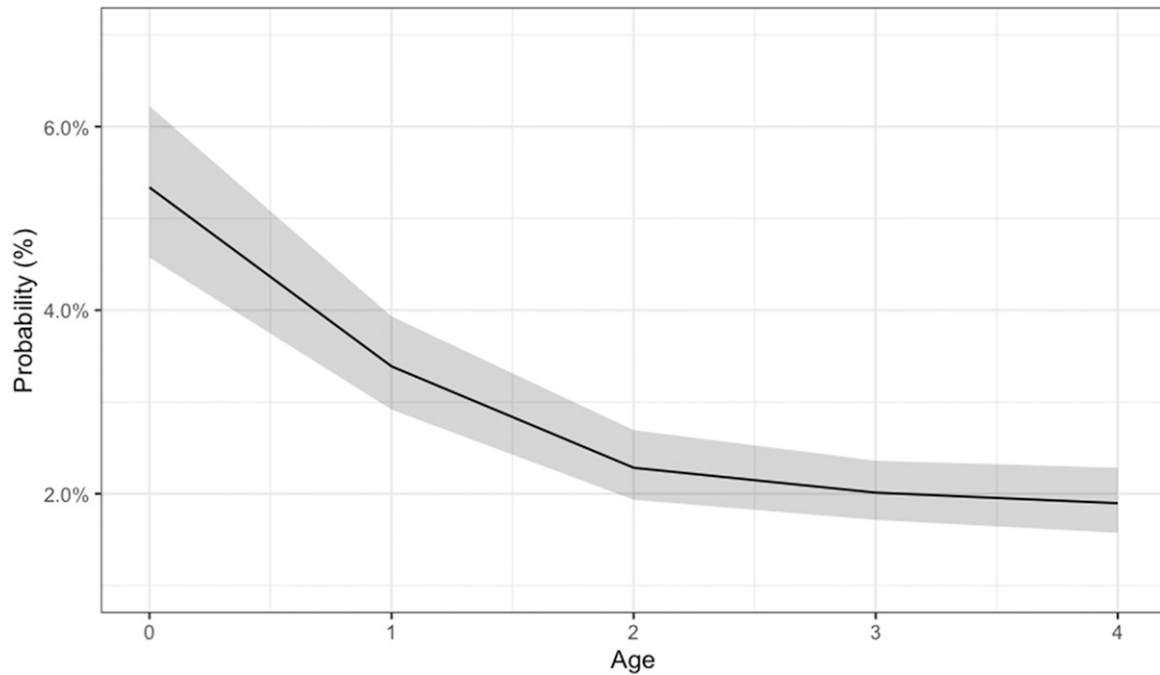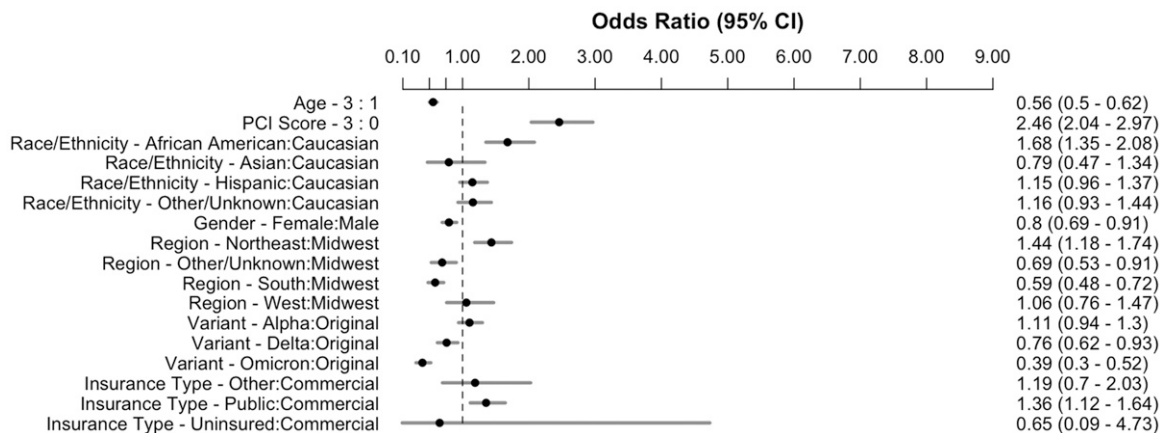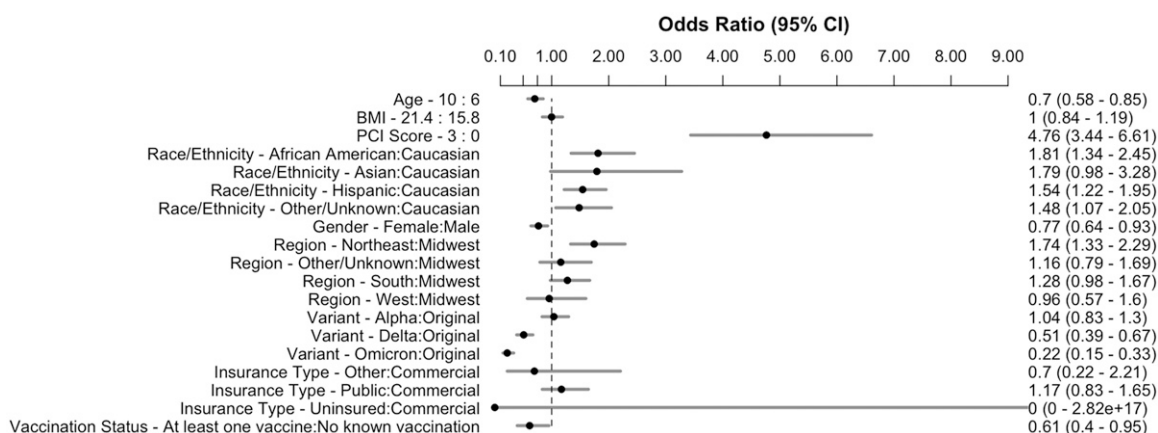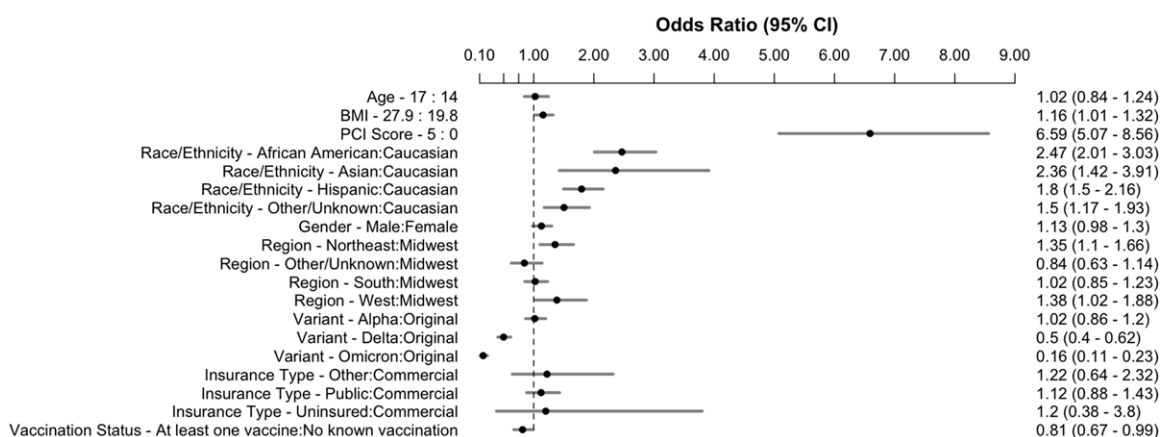# Supplemental Information

SUPPLEMENTAL FIGURE 5 Partial-effects plot displaying probability of severe outcomes by age for 0- to 4-year-old patients. Variables held constant: PCI score: 1 (representing absence of pretest comorbidities), race/ethnicity: Caucasian, sex: male, insurance type: commercial, region: Midwest, variant: original. Black line represents mean effect, gray area represents 95% confidence interval.

SUPPLEMENTAL FIGURE 6 Odds ratios with 95% confidence intervals from multivariable ordinal regression model between risk factors and severe outcomes with a primary diagnosis of COVID-10 in 0- to 4-year-old patients. For continuous variables represented by restricted cubic splines (age and PCI score), we present adjusted odds ratios comparing the 75th to 25th percentiles.

Odds Ratio (95% CI)

Age - 10 : 6	0.7 (0.58 - 0.85)
BMI - 21.4 : 15.8	1 (0.84 - 1.19)
PCI Score - 3 : 0	4.76 (3.44 - 6.61)
Race/Ethnicity - African American:Caucasian	1.81 (1.34 - 2.45)
Race/Ethnicity - Asian:Caucasian	1.79 (0.98 - 3.28)
Race/Ethnicity - Hispanic:Caucasian	1.54 (1.22 - 1.95)
Race/Ethnicity - Other/Unknown:Caucasian	1.48 (1.07 - 2.05)
Gender - Female:Male	0.77 (0.64 - 0.93)
Region - Northeast:Midwest	1.74 (1.33 - 2.29)
Region - Other/Unknown:Midwest	1.16 (0.79 - 1.69)
Region - South:Midwest	1.28 (0.98 - 1.67)
Region - West:Midwest	0.96 (0.57 - 1.6)
Variant - Alpha:Original	1.04 (0.83 - 1.3)
Variant - Delta:Original	0.51 (0.39 - 0.67)
Variant - Omicron:Original	0.22 (0.15 - 0.33)
Insurance Type - Other:Commercial	0.7 (0.22 - 2.21)
Insurance Type - Public:Commercial	1.17 (0.83 - 1.65)
Insurance Type - Uninsured:Commercial	0 (0 - 2.82e+17)
Vaccination Status - At least one vaccine:No known vaccination	0.61 (0.4 - 0.95)

SUPPLEMENTAL FIGURE 7 Odds ratios with 95% confidence intervals from multivariable ordinal regression model between risk factors and severe outcomes with a primary diagnosis of COVID-19 in 5- to 11-year-old patients. For continuous variables represented by restricted cubic splines (age, BMI [kg/m^2], and PCI score), we present adjusted odds ratios comparing the 75th to 25th percentiles.

Odds Ratio (95% CI)

Age - 17 : 14	1.02 (0.84 - 1.24)
BMI - 27.9 : 19.8	1.16 (1.01 - 1.32)
PCI Score - 5 : 0	6.59 (5.07 - 8.56)
Race/Ethnicity - African American:Caucasian	2.47 (2.01 - 3.03)
Race/Ethnicity - Asian:Caucasian	2.36 (1.42 - 3.91)
Race/Ethnicity - Hispanic:Caucasian	1.8 (1.5 - 2.16)
Race/Ethnicity - Other/Unknown:Caucasian	1.5 (1.17 - 1.93)
Gender - Male:Female	1.13 (0.98 - 1.3)
Region - Northeast:Midwest	1.35 (1.1 - 1.66)
Region - Other/Unknown:Midwest	0.84 (0.63 - 1.14)
Region - South:Midwest	1.02 (0.85 - 1.23)
Region - West:Midwest	1.38 (1.02 - 1.88)
Variant - Alpha:Original	1.02 (0.86 - 1.2)
Variant - Delta:Original	0.5 (0.4 - 0.62)
Variant - Omicron:Original	0.16 (0.11 - 0.23)
Insurance Type - Other:Commercial	1.22 (0.64 - 2.32)
Insurance Type - Public:Commercial	1.12 (0.88 - 1.43)
Insurance Type - Uninsured:Commercial	1.2 (0.38 - 3.8)
Vaccination Status - At least one vaccine:No known vaccination	0.81 (0.67 - 0.99)

SUPPLEMENTAL FIGURE 8 Odds ratios with 95% confidence intervals from multivariable ordinal regression model between risk factors and severe outcomes with a primary diagnosis of COVID-19 in 12- to 18-year-old patients. For continuous variables represented by restricted cubic splines (age, BMI [kg/m^2], and PCI score), we present adjusted odds ratios comparing the 75th to 25th percentiles.

SUPPLEMENTAL TABLE 2 Likelihood Ratio Rest to Assess Goodness of Fit for Each Age Group Model

Model	LR $\chi2$	df	P	C
0-4 y olds	3167	19	<.001	0.808
5-11 y olds	3263	22	<.001	0.879
12-18 y olds	6088	24	<.001	0.877

C, concordance index, a measure of goodness of fit for outcomes in a logistic regression model; df, degrees of freedom based on the number of variables included in the model; LR χ^2, likelihood ratio χ^2 statistic.

SUPPLEMENTAL TABLE 3 Comparison of Models That Include an Interaction Term for Region and Race/Ethnicity or Region and Insurance Category, for Each Age Group

Age Group	Model	Delta LR $\chi 2$	df	P
0-4 y olds	Linear Region:Race/Ethnicity Interaction	29.7	16	<.001
	Linear Region:Insurance Category Interaction	42.7	12	<.001
5-11 y olds	Linear Region:Race/Ethnicity Interaction	29.1	16	<.001
	Linear Region:Insurance Category Interaction	24.5	12	<.001
12-18 y olds	Linear Region:Race/Ethnicity Interaction	74.0	16	<.001
	Linear Region:Insurance Category Interaction	46.6	12	<.001

Δ LR χ^2, change in likelihood ratio χ^2 statistic relative to the respective age group model absent interaction terms; df, degrees of freedom based on the number of variables included in the model.

SUPPLEMENTAL TABLE 4 Demographics, Clinical Factors, and Outcomes for Children in a Sensitivity Analysis of This Cohort for Hospitalizations and Other Severe Outcomes With a Primary Diagnosis of COVID-19

	0–4 Year Olds (N = 35 088)	5–11 Year Olds (N = 75 574)	12–18 Year Olds (N = 54 775)	Overall (N = 165 437)
Race/ethnicity, n (%)				
African American	3090 (8.8)	5107 (9.3)	6974 (9.2)	15171 (9.2)
Asian	735 (2.1)	1105 (2.0)	1139 (1.5)	2979 (1.8)
Caucasian	13 608 (38.8)	27 094 (49.5)	41 533 (55.0)	82 235 (49.7)
Hispanic	8353 (23.8)	9552 (17.4)	12 061 (16.0)	29 966 (18.1)
Other/unknown	9302 (26.5)	11 917 (21.8)	13 867 (18.3)	35 086 (21.2)
Sex, n (%)				
Female	16 185 (46.1)	26 704 (48.8)	39 252 (51.9)	82 141 (49.7)
Male	18 814 (53.6)	27 996 (51.1)	36 246 (48.0)	83 056 (50.2)
Missing	89 (0.3)	75 (0.1)	76 (0.1)	240 (0.1)
Insurance category, n (%)				
Commercial	27 501 (78.4)	45 476 (83.0)	63 570 (84.1)	136 547 (82.5)
Other	679 (1.9)	1111 (2.0)	1461 (1.9)	3251 (2.0)
Public	4511 (12.9)	5342 (9.8)	7141 (9.4)	16994 (10.3)
Uninsured	121 (0.3)	259 (0.5)	526 (0.7)	906 (0.5)
Missing	2276 (6.5)	2587 (4.7)	2876 (3.8)	7739 (4.7)
Region, n (%)				
Midwest	8693 (24.8)	16 971 (31.0)	28 673 (37.9)	54 337 (32.8)
Northeast	8244 (23.5)	13 791 (25.2)	15 575 (20.6)	37 610 (22.7)
South	9255 (26.4)	10 829 (19.8)	16 151 (21.4)	36 235 (21.9)
West	1947 (5.5)	3912 (7.1)	4950 (6.5)	10 809 (6.5)
Other/unknown	6949 (19.8)	9272 (16.9)	10225 (13.5)	26 446 (16.0)
Predominant variant, n (%)				
Original	8042 (22.9)	10 012 (18.3)	17 390 (23.0)	35 444 (21.4)
Alpha	8585 (24.5)	11 485 (21.0)	19 922 (26.4)	39 992 (24.2)
Delta	6705 (19.1)	15 510 (28.3)	17 083 (22.6)	39 298 (23.8)
Omicron	5067 (14.4)	9002 (16.4)	11 826 (15.6)	25 895 (15.7)
Unknown/no predominant variant	6689 (19.1)	8766 (16.0)	9353 (12.4)	24 808 (15.0)
BMI				
Mean (SD)	18.1 (5.56)	19.5 (5.48)	24.7 (6.77)	21.7 (6.79)
Median (IQR)	17.0 (10.1–54.9)	17.8 (10.1–54.9)	23.0 (10.3–54.9)	19.9 (10.1–54.9)
Missing, n (%)	9934 (28.3)	9326 (17.0)	10 422 (13.8)	29 682 (17.9)
PCI Score				
Mean (SD)	2.00 (2.60)	2.28 (2.81)	3.08 (3.71)	2.59 (3.25)
Median (IQR)	1.00 (0.0–27.0)	1.00 (0.0–29.0)	2.00 (0.0–31.0)	2.00 (0.0–31.0)
Vaccination status, n (%)				
No known vaccination	35 088 (100)	51 405 (93.8)	63 330 (83.8)	149 823 (90.6)
At least 1 vaccine received	0 (0)	3370 (6.2)	12244 (16.2)	15614 (9.4)
Outcome, n (%)				
All other outcomes	34 166 (97.4)	54 299 (99.1)	74 740 (98.9)	163 205 (98.7)
Hospitalization without critical care	343 (1.0)	184 (0.3)	442 (0.6)	969 (0.6)
Hospitalization with critical care	576 (2.6)	291 (0.7)	386 (0.8)	1251 (1.1)
Deceased	3 (0.0)	8 (0.0)	1 (0.0)	12 (0.0)

Public insurance category includes Medicaid, Medicare, and Medicare Advantage. Critical care represents ICU admission or use of intensive respiratory support, defined as high-flow nasal cannula, nonintensive positive pressure ventilation, and mechanical ventilation. IQR, interquartile range.