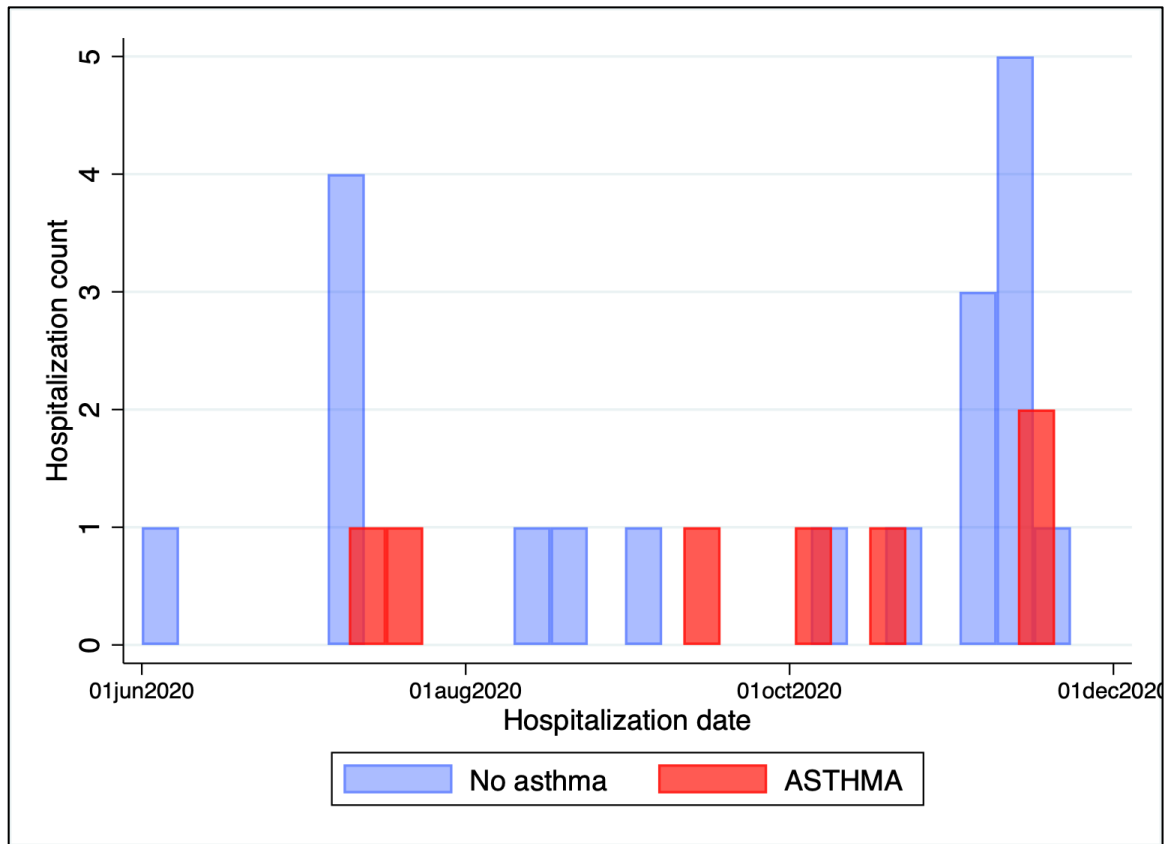<u>Supplementary Table S1</u> – Characteristics associated with hospitalization
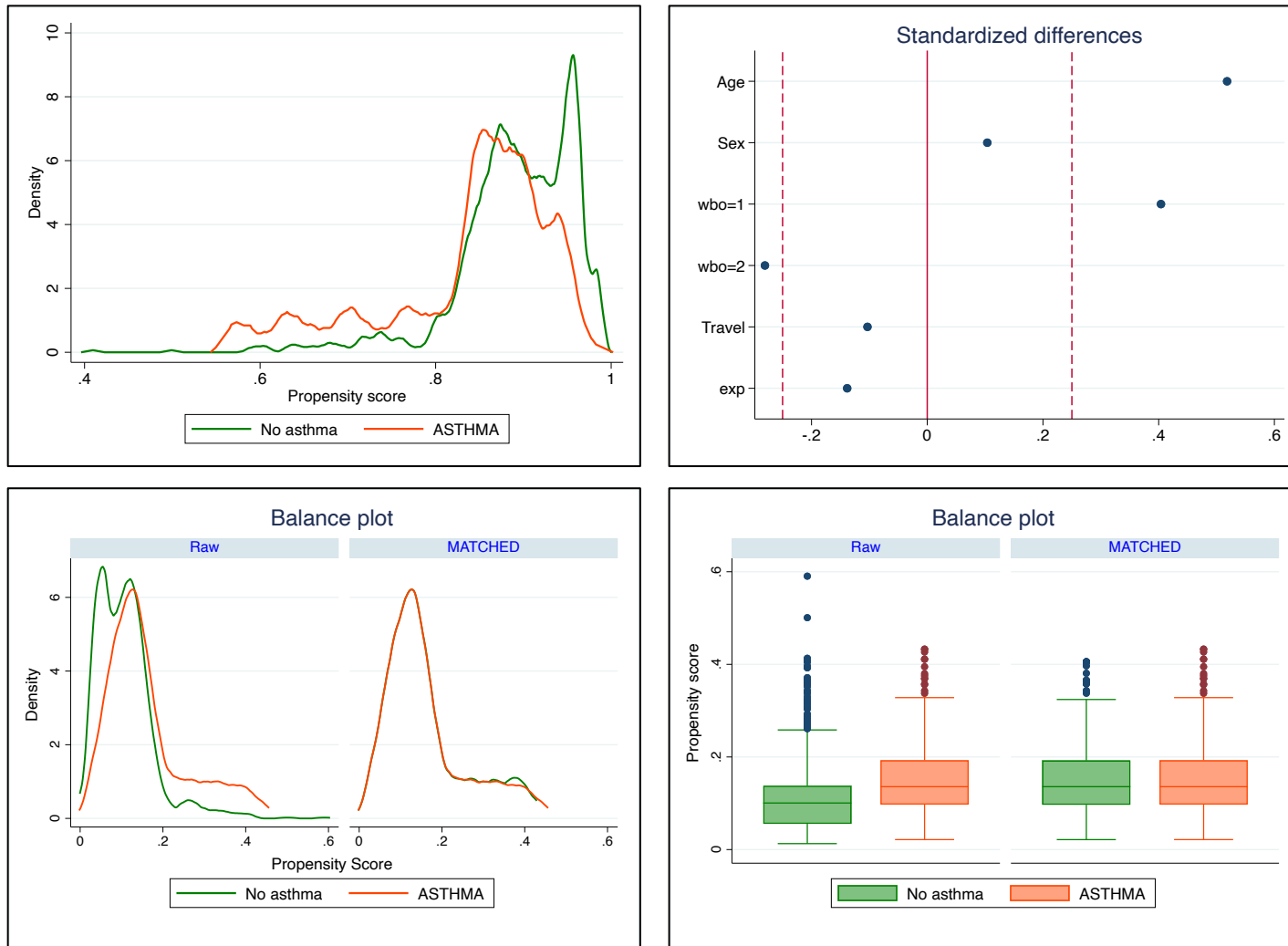
	Hospitalized (N=26)	Not hospitalized (N=1,226)	P-value
Age, years	7.4 [0.3-15.1]	12.6 [6.0-17.1]	0.004
Male sex	10 (38.5%)	629 (51.3%)	0.19
Race:			0.001
- White	**15 (57.7%)**	**993 (81.0%)**	
- Black	**10 (38.5%)**	**139 (11.3%)**	
- Other/unknown	**1 (3.9%)**	**94 (7.7%)**	
Hispanic	0 (0%)	9 (0.7%)	0.59
BMI, percentile (n=960)	82.0 [33.0-98.5]	65.8 [32.8-88.8]	0.08
Household income			
- Zip code median[1]	**$54.6 ($15.3)**	**$68.8 ($23.0)**	0.003
- Below median[2]	**19 (79.2%)**	**575 (48.2%)**	0.003
Pre-existing asthma diagnosis	**7 (26.9%)**	**135 (11.0%)**	**0.01**
Recent travel	1 (3.9%)	43 (3.5%)	0.94
Known exposure	**10 (38.5%)**	**822 (67.1%)**	**0.002**
Interval, days:			
- Symptoms to presentation	**3 [1-4]**	**2 [1-3]**	**0.01**
- Symptoms to test	3 [1-5]	2 [1-4]	0.71
Initial symptoms:			
- Asymptomatic	3 (11.5%)	137 (11.2%)	0.95
- Fever	**17 (65.4%)**	**479 (39.1%)**	**0.007**
- Fatigue	**8 (30.8%)**	**178 (14.5%)**	**0.02**
- Cough	15 (57.7%)	524 (42.7%)	0.13
- Wheezing	**5 (19.2%)**	**7 (0.6%)**	**<0.001**
- Dyspnea	**7 (26.9%)**	**31 (2.5%)**	**<0.001**
- Chest pain	**3 (11.5%)**	**20 (1.6%)**	**<0.001**
- Loss of smell	6 (23.1%)	142 (11.6%)	0.07
- Loss of taste	5 (19.2%)	150 (12.2%)	0.28
- Abdominal pain	2 (7.7%)	58 (4.7%)	0.48
- Vomiting	**7 (26.9%)**	**35 (2.9%)**	**<0.001**
Initial treatment:			
- Any pharmacologic treatment	**10 (38.5%)**	**15 (1.2%)**	**<0.001**
- Albuterol	**4 (15.4%)**	**14 (1.1%)**	**<0.001**
- Systemic steroids	**7 (26.9%)**	**4 (0.33%)**	**<0.001**

Numbers represent mean (SD) or median [interquartile range] for continuous variables, and n (%) for categorical variables. BMI: Body mass index. [1]Average of the median household incomes (in thousands of USD) for all participants' zip codes, based on US Census American Community Survey (ACS) 5-year data (2015-2019). [2]Number of participants who live in zip codes with median household income below the median for all zip codes in the study.

Supplementary Figure S1 – Distribution of hospitalizations over time during the study period

<u>Supplementary Figure S2</u>: Results from propensity score matching

Top left shows distribution of propensity score by asthma status prior to propensity score matching (PSM). Top right shows particularly high standardized differences for age and race. Lower row shows density (left) and box plots (right) that demonstrate good overall balance after PSM.

<u>Supplementary Table S2</u> – Demographic characteristics of A+C Cases and C+ Controls after propensity score matching

	A+C Cases (Asthma and COVID-19)	C+ Controls (COVID-19 only)	P-value
N	142	398	
Age, years	14.6 [10.7-17.9]	14.5 [9.6-17.8]	0.31
Male sex	79 (55.6%)		
Race:			0.23
- White	103 (72.5%)	314 (78.9%)	
- Black	36 (25.4%)	74 (18.6%)	
- Other/unknown	3 (2.1%)	10 (2.5%)	
Hispanic	1 (0.7%)	1 (0.3%)	0.47

Propensity score matching (PSM) performed with a 1:4 case:control ratio with replacement, matching on age, sex, race, recent travel, and known exposure. Compared to Table 1 in the main manuscript, this shows adequate matching on the relevant covariates, but also a significant decrease in sample size (from N=1,252 to N=540, or 43.1% of original sample size).

<u>Supplementary Table S3</u> – Association between asthma and hospitalization for COVID-19 using propensity score matching

Replacement	No		Yes		
1:N ratio	1:1	1:2	1:3	1:4	1:5
Controls	142	223	316	398	463
Total sample	284	365	458	540	605
Hospitalized	8	10	12	12	14
T-statistic	2.16	1.74	1.92	1.91	1.81
Asthma:					
- OR	7.31	3.80	4.04	4.08	3.38
- 95%CI	(0.89-60.2)	(0.98-14.9)	(1.16-14.0)	(1.27-13.1)	(1.16-9.8)
- P-value	0.064	0.056	0.028	0.018	0.025

Table shows results from the analysis of asthma vs hospitalization risk, using PSM rather than adjusted regression analysis as shown in Table 3 in the main manuscript. Results with 1:1 and 1:2 matching approach but do not reach statistical significance, despite including only 22.7% and 29.2% of the original sample size. Results with 1:3 matching or higher (>36.6% of the original sample size) were all significant, with estimates similar to those in Table 3 Model 1 (OR=3.95, 95%CI=1.43-10.9).

Supplementary Table S4 – Asthma characteristics restricted to cases and controls seen in CHP asthma subspecialty clinics (Pulmonology and/or Allergy)

	A+C cases	A+ controls	P-value
Asthma severity:			0.70
- Intermittent	8 (27.6%)	32 (23.5%)	
- Mild persistent	13 (44.8%)	50 (36.8%)	
- Moderate persistent	6 (20.6%)	41 (30.2%)	
- Severe persistent	2 (6.9%)	13 (9.6%)	
Controller medication:			
- ICS	16 (55.2%)	71 (52.2%)	0.77
- ICS/LABA	5 (17.2%)	22 (16.2%)	0.89
Symptom control:			
- C-ACT score	23.7 (1.5)	21.6 (4.0)	0.38
- ACT score	20.9 (3.6)	20.2 (4.7)	0.60
- Poorly controlled[1]	4 (23.5%)	27 (31.4%)	0.77
Lung function:			
- FEV1, %pred	95.2 (13.3)	94.1 (17.7)	0.80
- FVC, %pred	98.7 (10.7)	92.2 (38.2)	0.46
- FEV1/FVC	84.3 (8.6)	72.3 (28.1)	0.08
History of atopy:			
- Eczema	8 (27.6%)	61 (44.9%)	0.09
- Allergic rhinitis	18 (62.1%)	102 (75.0%)	0.16
- Food allergies	6 (20.7%)	40 (29.4%)	0.34
- Any specific IgE+	3 (10.3%)	7 (5.2%)	0.38
- Any skin test+	1 (3.5%)	6 (4.4%)	0.99
- None	**9 (31.0%)**	**21 (15.4%)**	**0.048**
Atopy biomarkers:			
- Eosinophils, percent	**2 [1-3]**	**4 [2-7]**	**0.02**
- Eosinophils, cells/μL	**140 [50-240]**	**300 [190-580]**	**0.006**
- Total IgE, UI/mL	501 [169-839]	195 [80-704]	0.59
Subspecialist care:			
- Pediatric Pulmonology	20 (68.9%)	84 (61.8%)	0.47
- Allergy / Immunology	11 (37.9%)	72 (52.9%)	0.14
Severe exacerbations:			
- Any events[2]	16 (55.2%)	71 (52.2%)	0.77
- Events in the past year[3]	1 [0.5-2.5]	1.5 [1-2.5]	0.31

Numbers represent mean (SD) or median [interquartile range] for continuous variables, and n (%) for categorical variables. ACT: Asthma control test (ages ≥12 years, range 5-25). C-ACT: Childhood asthma control test (ages 4-11 years, range 0-27). [1]Defined as C-ACT or ACT ≤19. [2]Number of patients with ≥1 asthma-related ED visit, hospitalization, or systemic steroid course from January 2018 to December 2019. [3]Rate among those who had at least one event.