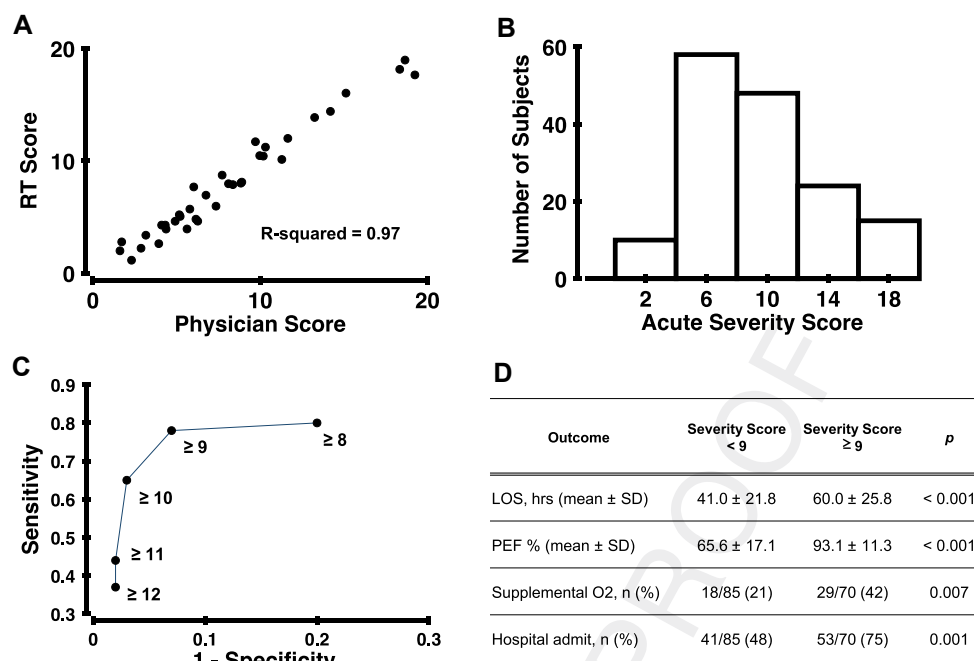**FIG E1.** Exposure to mouse and dust mite allergen is associated with more baseline symptoms but not with higher acute exacerbation severity. Subjects sensitized (specific IgE ≥ 0.35 kU/L) and exposed to **(A)** mouse allergen (Mus m1, ≥0.5 μg/g of dust, n = 79) or **(B)** dust mite allergen (Der f1, ≥2.0 μg/g of dust, n = 60) in the bedroom demonstrate worse baseline Asthma Control Questionnaire scores as the degree of allergen sensitization increases than do subjects not exposed to these allergens (mouse, n = 39; dust mite, n = 37). However, subjects exposed to **(C)** mouse allergen (n = 54) or **(D)** dust mite (n = 39) allergen in the bedroom do not have more severe rhinovirus-triggered asthma exacerbations, compared with subjects not exposed to these allergens (mouse, n = 25; dust mite, n = 23). Linear regression coefficients, 95% CIs, and *P* values for the interaction between allergen exposure status and IgE levels are shown (multivariate analyses adjusted for age, sex, race, annual income, lung function, baseline asthma severity, symptom duration, medication adherence, total number of ImmunoCAP positives, and season). *ACQ*, Asthma Control Questionnaire; *coef*, coefficient.

FIG E2. Validation data for the Acute Severity Score. **A,** Comparison of Acute Severity Scores determined by 2 different groups of observers, respiratory therapists (RTs) and physicians (n = 36). B, Distribution of Acute Severity Scores (n = 155). **C,** Receiver operator characteristic curve for Acute Severity Score compared with ICU admission. The area under the curve = 90%. **D,** Comparison of Acute Severity Scores to other outcomes. *P* values for continuous and categorical variables determined by *t* test or Pearson chi-square test, respectively.

Outcome	Severity Score < 9	Severity Score ≥ 9	p
LOS, hrs (mean ± SD)	41.0 ± 21.8	60.0 ± 25.8	< 0.001
PEF % (mean ± SD)	65.6 ± 17.1	93.1 ± 11.3	< 0.001
Supplemental O2, n (%)	18/85 (21)	29/70 (42)	0.007
Hospital admit, n (%)	41/85 (48)	53/70 (75)	0.001

TABLE E1. Summary of viral infections

Infection	% Total enrollment (n)
Rhinovirus/enterovirus	52 (95)
hRV-A (% hRV total)	(48%)
hRV-B (% hRV total)	(12%)
hRV-C (% hRV total)	(40%)
Influenza (A or B)	2 (4)
Human metapneumovirus	3 (5)
Parainfluenza (1, 2, or 3)	5 (9)
Respiratory syncitial virus	3 (6)
Multiple viruses	2 (4)
Negative	33 (60)

hRV, ■■■

The results for all 183 enrolled subjects are shown. Only rhinovirus single-positive subjects (n = 95) and control subjects (negative for all tested viruses, n = 60) were used for further analysis.

TABLE E2. Characteristics of virus-negative and rhinovirus-positive subjects

Characteristic	Total	Virus−	hRV+	P value*
Enrolled, n (% total)	155 (100)	60 (38.7)	95 (61.3)	NA
Age (y), mean ± SD	9.9 ± 3.2	10.3 ± 3.1	9.7 ± 3.2	.321
Sex: male, n (%)	103 (66.5)	42 (70)	61 (64.2)	.489
Ethnicity, n (%)				
Black/African	75 (48.4)	28 (46.7)	47 (49.5)	.745
Hispanic	35 (22.6)	16 (26.7)	19 (20.0)	.43
White/European	35 (22.5)	13 (21.6)	22 (23.1)	.43
Other	10 (6.5)	3 (5.0)	7 (7.4)	.742
BMI, mean ± SD	21.7 ± 5.3	21.9 ± 5.2	21.6 ± 5.3	.733
Hospital disposition, n (%)				
Discharged	64 (41.2)	33 (55.0)	28 (29.5)	.002
Hospital admission	91 (58.7)	27 (45.0)	67 (70.5)	.002
ICU admission	50 (32.2)	10 (16.7)	40 (42.1)	.001
Baseline lung function, mean ± SD				
FEV1, % predicted	99.7 ± 14.7	98.6 ± 13.0	100.5 ± 15.8	.425
FEV_1/FVC	84.4 ± 6.3	83.8 ± 5.9	84.8 ± 6.6	.33
Maternal asthma, n (%)	67 (43.2)	24 (40)	43 (45.3)	.618
Composite severity, mean ± SD†	7.5 ± 3.1	7.4 ± 2.7	7.5 ± 3.0	.921
Adherence scale, mean ± SD‡	4.0 ± 0.9	3.9 ± 0.9	4.0 ± 0.9	.652
Lapsed prescription, n (%)§	86 (55.5)	30 (50.0)	56 (59.0)	.321
Symptom duration (h), mean ± SD‖	40.5 ± 33.8	40.2 ± 32.4	40.6 ± 34.9	.937
ImmunoCAP positives, mean ± SD‖	4.3 ± 2.4	4.1 ± 2.4	4.4 ± 2.4	.506
Allergen sensitization, n (%)				
Mouse	121 (78.0)	50 (83.3)	71 (74.7)	.237
Dust mite	103 (66.5)	44 (73.3)	59 (62.1)	.166
Alternaria	28 (18.1)	9 (15.0)	19 (20.0)	.523
Aspergillus	43 (27.7)	15 (25.0)	28 (29.5)	.585
Cat	117 (76.0)	44 (74.6)	73 (76.8)	.847
Dog	121 (78.1)	44 (73.3)	77 (81.1)	.32
Mixed grasses	59 (38.1)	22 (36.7)	37 (39.0)	.866
Cockroach	43 (27.7)	23 (38.3)	20 (21.1)	.027
Total IgE (U/mL), mean ± SD	614 ± 801	608 ± 730	617 ± 847	.944
Eosinophils (10^3 cells/μL), mean ± SD	0.43 ± 0.47	0.42 ± 0.38	0.43 ± 0.53	.915
ETS exposure (ever), n (%)	89 (57.4)	37 (61.7)	52 (54.7)	.41
Allergen exposure, %				
Mouse¶	66.9	60.9	70.1	.681
Dust mite#	61.9	61.8	61.9	.83
Annual income >$25K, n (%)	111 (72)	45 (75.0)	69 (70)	.584
Season (of exacerbation), n (%)				
Spring	51 (32.9)	18 (30.0)	33 (34.7)	.601
Summer	33 (21.3)	11 (18.3)	22 (23.2)	.549
Fall	47 (30.3)	20 (33.3)	27 (28.4)	.591
Winter	24 (15.5)	11 (18.3)	13 (13.7)	.497
Meters to major road, mean ± SD	694 ± 607	662 ± 634	713 ± 592	.622

BMI, Body mass index; *FVC*, forced vital capacity; *hRV*, ■■■; *NA*, not available/applicable.

*t test or Pearson chi-square test for continuous and categorical variables, respectively.

†Composite Asthma Severity Index.[E19]

‡Medication Adherence Report Scale for Asthma.[E18]

§More than 60 d without filling controller prescription.

‖More than 0.35 kU/L.

¶A total of 118 dust samples collected, exposure defined as ≥0.5 μg Mus m1/g of dust.

#A total of 97 dust samples collected, exposure defined as ≥2.0 μg Der f1/g of dust.

TABLE E3. Univariate linear regression analysis of Acute Severity Score*

	Acute Severity Score		
	Coefficient	**95% CI**		**P value**
Rhinovirus infection	3.65	2.32	4.98	<.001
Age (y)	−0.11	−0.34	0.11	.320
Sex: male	−0.46	−1.96	1.03	.543
Ethnicity				
Black/African	−0.61	−2.02	0.80	.395
Hispanic	−1.23	−2.91	0.45	.149
White/European	2.01	0.35	3.67	.018
BMI	−0.06	−0.20	0.07	.372
Lung function				
FEV_1 (% predicted)	−0.09	−0.13	−0.04	<.001
FEV_1/FVC	−0.19	−0.29	−0.08	.001
Maternal asthma	0.17	−1.25	1.60	.810
Composite severity†	0.07	−0.16	0.30	.562
Adherence scale‡	−0.04	−0.93	0.85	.928
Expired prescription§	2.97	1.63	4.31	<.001
Symptom duration (h)	0.04	0.02	0.06	<.001
ImmunoCAP positives‖	0.72	0.45	0.98	<.001
Specific allergen IgE (kU/L)¶				
Mouse	0.04	0.02	0.07	.001
Dust mite	0.09	0.06	0.11	<.001
Alternaria	0.07	−0.04	0.17	.210
Aspergillus	0.01	−0.16	0.19	.877
Cat	0.00	−0.02	0.01	.631
Dog	0.00	−0.02	0.03	.701
Mixed grasses	0.03	−0.02	0.08	.241
Cockroach	0.05	−0.02	0.11	.140
Total IgE (U/mL)	0.00	0.00	0.00	.284
Eosinophils (10^3 cells/μL)	0.55	−0.95	2.05	.468
ETS exposure (ever)	−0.94	−2.37	0.48	.192
Allergen exposure				
Mouse#	−0.04	−1.96	1.87	.966
Dust mite**	−0.06	−2.09	1.96	.951
Annual income >$25K	−0.32	−1.89	1.24	.684
Season (of exacerbation)				
Spring	0.30	−1.21	1.80	.699
Summer	0.57	−1.15	2.30	.512
Fall	0.36	−1.18	1.90	.646
Winter	−1.81	−3.74	0.12	.066
Meters to major road	0.00	0.00	0.00	.402

BMI, Body mass index; *ETS*, ■■■; *FVC*, forced vital capacity.

*■■■

†Composite Asthma Severity Index.[E19]

‡Medication Adherence Report Scale for Asthma.[E18]

§More than 60 d without filling controller prescription.

‖hRV+ subjects only (omalizumab therapy, n = 16; standard therapy, n = 79).

¶More than 0.35 kU/L.

#A total of 118 dust samples collected, exposure defined as ≥0.5 μg Mus m1/g of dust.

**A total of 97 dust samples collected, exposure defined as ≥2.0 μg Der f1/g of dust.

TABLE E4. Univariate linear regression of continuous outcome measures related to acute severity*

	MPIS			PEF, % predicted			Time to q2hr albuterol			Hospital length of stay		
	Coef.	95% CI	*P* value	Coef.	95% CI	*P* value	Coef.	95% CI	*P* value	Coef.	95% CI	*P*
Rhinovirus infection	2.76	1.66 3.87	<.001	−16.19	−22.11 −10.27	<.001	13.90	8.14 19.66	<.001	21.43	10.53 32.32	<.001
Age (y)	−0.08	−0.26 0.11	.401	0.72	−0.27 1.72	.151	−0.09	−1.05 0.86	.850	−0.74	−2.42 0.95	.388
Sex: male	−0.43	−1.66 0.80	.493	1.76	−4.91 8.42	.603	2.79	−3.56 −3.56	.387	7.02	−4.30 18.34	18.339
Ethnicity												
Black/African	−0.46	−1.62 0.70	.435	−2.11	−8.40 4.18	.509	−2.63	−8.63 3.38	.389	−1.80	−12.43 8.84	.738
Hispanic	−0.99	−2.37 0.40	.161	8.63	3.29 17.97	.031	−5.93	−13.06 1.20	.102	−11.31	−24.35 1.73	.088
White/European	1.63	0.27 3.00	.019	−5.82	−14.27 0.63	.072	7.67	0.58 0.58	.034	4.47	−7.69 16.64	.467
BMI	−0.07	−0.18 0.04	.244	0.07	0.10 1.28	.032	−0.02	−0.60 0.55	.931	−0.79	−1.73 0.15	.100
Lung function												
FEV$_1$ (% predicted)	−0.20	−0.12 −0.05	<.001	0.36	0.16 0.57	.001	−0.28	−0.48 −0.08	.007	−0.56	−0.89 −0.23	.001
FEV$_1$/FVC	−0.17	−0.25 −0.08	<.001	0.69	0.20 1.18	.006	−0.34	−0.82 0.13	.156	−0.07	−0.88 0.74	.862
Maternal asthma	0.17	−1.00 1.35	.770	−3.76	−10.09 2.56	.242	1.16	−4.91 7.22	.707	6.49	−4.18 17.17	.230
Composite severity†	0.19	−0.01 0.38	.059	0.36	−0.65 1.38	.481	0.71	−0.37 1.56	.226	0.30	−1.47 2.06	.739
Adherence Scale‡	−0.10	−0.83 0.62	.779	0.40	−3.52 4.32	.838	0.36	−3.70 4.43	.860	−0.11	−6.65 6.43	.973
Expired prescription§	2.53	1.43 3.62	<.001	−9.63	−15.78 −3.49	.002	9.26	3.39 15.12	.002	6.82	−3.85 17.49	.208
Symptom duration (h)	0.03	0.02 0.05	<.001	−0.15	−0.24 −0.06	.001	0.08	−0.01 0.17	.074	0.07	−0.08 0.22	.368
ImmunoCAP positives‖	0.63	0.41 0.85	<.001	−3.31	−4.50 −2.12	<.001	2.10	0.91 3.30	.001	2.40	0.37 4.44	.021
Specific allergen IgE‖												
Mouse	0.04	0.02 0.06	<.001	−0.21	−0.31 −0.10	.001	0.07	−0.03 0.18	.167	0.10	−0.09 0.29	.313
Dust mite	0.07	0.05 0.09	<.001	−0.39	−0.49 −0.28	<.001	0.30	0.20 0.41	<.001	0.37	0.19 0.56	<.001
Alternaria	0.06	−0.03 0.14	.190	0.00	−0.47 0.47	.990	0.10	−0.35 0.55	.667	0.20	−0.55 0.94	.602
Aspergillus	0.01	−0.13 0.16	.856	0.06	−0.72 0.83	.885	−0.12	−0.86 −0.86	.741	−0.75	−2.89 1.39	.488
Cat	0.00	−0.02 0.01	.754	0.04	−0.04 0.12	.374	−0.04	−0.12 0.04	.311	−0.16	−0.29 −0.04	.033
Dog	0.01	−0.01 0.03	.549	−0.01	−0.12 0.10	.841	0.05	−0.05 0.15	.327	0.00	−0.19 0.19	.998
Mixed grasses	0.02	−0.02 0.06	.262	0.01	−0.21 0.23	.908	0.05	−0.17 0.26	.669	−0.04	−0.34 0.26	.776
Cockroach	0.04	−0.01 0.09	.163	−0.22	−0.49 0.06	.119	0.12	−0.14 0.38	.362	0.08	−0.35 0.52	.704
Total IgE	0.00	0.00 0.00	.156	0.00	−0.01 0.00	.012	0.00	0.00 0.01	.148	0.01	0.00 0.01	.095
Eosinophil count	0.34	−0.89 1.57	.586	−5.48	−12.11 1.15	.104	3.58	−2.85 10.01	.274	3.54	−6.16 13.24	.470
ETS exposure (ever)	−0.80	−1.97 0.37	.178	3.99	−2.34 10.33	.215	0.22	−5.86 6.31	.942	−4.48	−15.24 6.28	.411
Allergen exposure												
Mouse¶	−0.22	−1.78 1.35	.783	2.54	−5.55 10.62	.535	3.68	−4.74 12.10	.388	3.22	−10.45 16.89	.640
Dust mite#	0.08	−1.58 1.74	.923	0.18	−8.84 9.21	.968	−4.99	−14.29 4.31	.289	−4.39	−18.94 10.17	.549
Annual income >$25K	−0.67	−1.96 0.61	.302	0.27	−6.71 7.25	.939	4.48	−2.15 11.11	.184	7.21	−5.08 19.50	.247
Season (of exacerbation)												
Spring	0.36	−0.87 1.60	.561	−3.92	−10.59 2.75	.247	−1.70	−8.09 4.69	.600	0.13	−11.09 11.36	.981
Summer	0.37	−1.05 1.79	.606	−0.92	−8.61 6.77	.813	3.50	−3.82 10.83	.346	5.40	−7.55 18.36	.410
Fall	0.34	−0.92 1.60	.595	−0.91	−7.76 5.94	.794	0.84	−5.70 7.38	.800	−0.40	−12.16 11.36	.947
Winter	−1.64	−3.22 −0.05	.043	9.27	0.69 17.85	.034	−2.98	−11.28 5.32	.480	−6.37	−20.84 8.10	.384
Meters to major road	0.00	0.00 0.00	.308	0.00	−0.01 0.00	.142	0.00	−0.01 0.00	.926	0.00	−0.01 0.01	.930

BMI, Body mass index; *Coef.*, coefficient; *ETS*, ■■■; *FVC*, forced vital capacity.

*Aggregate data for all subjects, n = 155 (unless otherwise noted).

†Composite Asthma Severity Index.[E19]

‡Medication Adherence Report Scale for Asthma.[E18]

§More than 60 d without filling controller prescription.

‖More than 0.35 kU/L.

¶A total of 118 dust samples collected, exposure defined as ≥0.5 μg Mus m1/g of dust.

#A total of 97 dust samples collected, exposure defined as ≥2.0 μg Der f1/g of dust.

TABLE E5. Univariate logistic regression of binary outcome measures related to acute severity*

	Supplemental O$_2$				Hospital admission				ICU admission			
	OR	95% CI		P value	OR	95% CI		P value	OR	95% CI		P value
Rhinovirus infection	4.53	1.94	10.58	.001	2.92	1.49	5.73	.002	3.64	1.65	8.03	.001
Age (y)	0.94	0.84	1.05	.256	1.01	0.91	1.11	.923	1.00	0.89	1.11	.938
Sex: male	1.27	0.63	2.54	.499	1.20	0.61	2.37	.593	0.97	0.48	1.98	.935
Ethnicity												
Black/African	1.91	0.95	3.84	.068	1.06	0.55	2.02	.865	1.24	0.63	2.43	.535
Hispanic	0.16	0.05	0.56	.004	0.71	0.33	1.52	.383	0.45	0.18	1.11	.083
White/European	1.76	0.80	3.86	.160	1.56	0.70	3.47	.277	1.13	0.51	2.50	.771
BMI	0.91	0.84	0.99	.028	1.02	0.96	1.09	.480	0.98	0.92	1.05	.582
Lung function												
FEV$_1$ (% predicted)	0.98	0.95	1.00	.084	1.00	0.97	1.02	.699	0.99	0.96	1.01	.279
FEV$_1$/FVC	1.01	0.95	1.06	.794	0.96	0.91	1.01	.119	1.00	0.95	1.05	.963
Maternal asthma	1.09	0.55	2.17	.809	0.93	0.49	1.79	.834	0.64	0.32	1.29	.212
Composite severity†	1.14	1.02	1.27	.026	1.12	1.01	1.25	.034	1.17	1.05	1.31	.006
Adherence Scale‡	1.06	0.69	1.64	.787	1.01	0.67	1.52	.963	0.81	0.53	1.26	.359
Expired prescription†	1.27	0.63	2.54	.499	1.22	0.64	2.34	.542	1.03	0.52	2.03	.929
Symptom duration (h)§	1.00	0.99	1.01	.606	1.00	0.99	1.01	.577	0.99	0.98	1.00	.138
ImmunoCAP positives‖	1.11	0.96	1.28	.170	1.16	1.01	1.33	.036	1.17	1.01	1.35	.034
Specific allergen IgE, (kU/L)‖												
Mouse	1.00	0.99	1.01	.804	1.01	1.00	1.02	.241	1.01	0.99	1.02	.373
Dust mite	1.01	1.00	1.02	.209	1.02	1.00	1.03	.017	1.01	1.00	1.02	.136
Alternaria	1.03	0.98	1.08	.208	1.01	0.96	1.07	.630	1.04	0.98	1.09	.185
Aspergillus	1.02	0.95	1.11	.546	0.98	0.91	1.06	.629	0.99	0.90	1.08	.782
Cat	1.00	0.99	1.01	.480	1.00	0.99	1.01	.648	1.00	0.99	1.01	.813
Dog	1.00	0.99	1.01	.921	1.00	0.99	1.01	.734	1.00	0.99	1.01	.964
Mixed grasses	1.01	0.99	1.03	.301	1.04	0.98	1.09	.195	1.02	0.99	1.04	.124
Cockroach	1.00	0.97	1.03	.858	1.00	0.97	1.03	.872	0.99	0.95	1.02	.485
Total IgE (U/mL)	1.00	1.00	1.00	.337	1.00	1.00	1.00	.707	1.00	0.99	1.00	.380
Eosinophils (10^3 cells/μL)	1.04	0.51	2.13	.916	1.15	0.55	2.42	.705	1.13	0.56	2.25	.736
ETS exposure (ever)	1.00	0.50	2.00	.996	1.12	0.58	2.15	.733	1.04	0.52	2.05	.920
Allergen exposure												
Mouse¶	1.02	0.44	2.39	.961	1.49	0.65	3.41	.345	1.80	0.75	4.28	.187
Dust mite‡	0.89	0.36	2.20	.803	1.17	0.46	2.94	.745	0.52	0.21	1.27	.151
Annual income > $25K	0.91	0.43	1.93	.799	1.62	0.80	3.29	.181	1.39	0.64	3.00	.404
Season (of exacerbation)												
Spring	1.84	0.90	3.75	.094	1.14	0.57	2.27	.708	1.81	0.90	3.66	.098
Summer	0.83	0.35	1.95	.668	1.00	0.45	2.19	.996	0.89	0.39	2.05	.787
Fall	0.83	0.39	1.77	.634	0.83	0.41	1.66	.591	0.73	0.35	1.56	.420
Winter	0.56	0.19	1.60	.276	1.10	0.45	2.69	.840	0.66	0.24	1.78	.410
Meters to major road	1.00	1.00	1.00	.488	1.00	1.00	1.00	.842	1.00	1.00	1.00	.857

BMI, Body mass index; *ETS*, ■■■; *FVC*, forced vital capacity; *OR*, odds ratio.

[#]A total of 97 dust samples collected, exposure defined as ≥2.0 μg Der f1/g of dust.

*Aggregate data for all subjects, n = 155 (unless otherwise noted).

†Composite Asthma Severity Index.[E19]

‡Medication Adherence Report Scale for Asthma.[E18]

§More than 60 d without filling controller prescription.

‖More than 0.35 kU/L.

¶A total of 118 dust samples collected, exposure defined as ≥0.5 μg Mus m1/g of dust.