

**SUPPLEMENTAL TABLE 1**

Univariable models of factors associated with any wheeze or persistent wheeze

	Any Wheeze			Persistent Wheeze		
	Odds Ratio	95% C.I.	p-value	Odds Ratio	95% C.I.	p-value
<b>Age (years)</b>	1.02	1.00 - 1.03	0.06	1.02	1.02 - 1.00	0.03
<b>Sex</b>						
Female (ref: Male)	1.07	0.61 - 1.86	0.82	0.93	0.45 - 1.90	0.84
<b>Race</b>						
Non-White (ref: White)	0.74	0.39 - 1.39	0.35	1.02	0.46 - 2.22	0.97
<b>Vitamin D Level (ng/mL)</b>	1.01	0.99 - 1.03	0.35	1.02	1.00 - 1.04	0.07
≥ 30 (normal)	ref			ref		
≥20 - <30 (insufficient)	0.87	0.48 - 1.57	0.65	0.85	0.41 - 1.75	0.65
<20 (deficient)	1.02	0.60 - 1.75	0.95	0.73	0.38 - 1.39	0.34
<b>Regional Fat*</b>						
Android, % fat	1.02	1.00 - 1.03	0.10	1.01	0.98 - 1.03	0.41
quartile 1 (lowest)	ref			ref		
quartile 2	1.31	0.71 - 2.42	0.39	0.91	0.41 - 2.02	0.81
quartile 3	1.09	0.59 - 2.03	0.78	0.95	0.43 - 2.11	0.89
quartile 4 (highest)	2.05	1.11 - 3.78	0.02	1.53	0.73 - 3.22	0.26
Gynoid, % fat	1.010	0.99 - 1.04	0.26	1.00	0.98 - 1.03	0.89
quartile 1 (lowest)	ref			ref		
quartile 2	1.66	0.89 - 3.10	0.11	1.30	0.57 - 2.98	0.53
quartile 3	1.59	0.87 - 2.92	0.13	2.23	1.05 - 4.75	0.04
quartile 4 (highest)	1.43	0.78 - 2.61	0.25	0.99	0.43 - 2.27	0.98
Trunk, % fat	1.02	1.00 - 1.04	0.08	1.012	0.99 - 1.04	0.35
quartile 1 (lowest)	ref			ref		
quartile 2	1.65	0.89 - 3.03	0.11	1.11	0.49 - 2.51	0.81
quartile 3	1.80	0.97 - 3.33	0.06	1.95	0.92 - 4.22	0.09
quartile 4 (highest)	1.89	1.02 - 3.51	0.04	1.42	0.64 - 3.17	0.39
Total body, % fat	1.02	1.00 - 1.05	0.06	1.02	0.98 - 1.05	0.36
quartile 1 (lowest)	ref			ref		
quartile 2	2.17	1.16 - 4.06	0.02	1.52	0.66 - 3.54	0.33
quartile 3	2.07	1.11 - 3.86	0.02	2.56	1.16 - 5.66	0.02
quartile 4 (highest)	2.12	1.14 - 3.95	0.02	1.50	0.65 - 3.49	0.34
<b>BMI (kg/m<sup>2</sup>)</b>	1.05	1.01 - 1.09	0.01	1.07	1.02 - 1.11	0.00
< 25 (normal or underweight)	ref			ref		
25-<30 (overweight)	1.12	0.67 - 1.88	0.66	1.05	0.52 - 2.11	0.90
≥30 (obese)	2.14	1.26 - 3.65	0.01	2.13	1.11 - 4.10	0.02
<b>Cigarette Smoking</b>						
Current ≥1/2 pack/day	4.82	2.05 - 11.34	<0.01	4.86	2.00 - 11.83	<0.01
Current <1/2 pack/day	1.81	0.81 - 4.02	<0.01	2.65	1.02 - 6.89	0.05
Former	2.12	1.31 - 3.44	<.001	1.79	0.93 - 3.45	0.08
Never	ref			ref		
<b>Marijuana</b>						
Current	1.01	0.52 - 1.95	0.98	0.88	0.37 - 2.11	0.78
Former	1.90	0.97 - 3.70	0.06	1.43	0.65 - 3.10	0.37
Never	ref			ref		
<b>Occupational dust or fume exposure</b>	1.09	0.71 - 1.68	0.69	1.09	0.63 - 1.89	0.76
<b>Medical conditions</b>						
Hay fever	1.87	1.11 - 3.14	0.02	1.24	0.66 - 2.34	0.51
Diabetes	1.88	1.03 - 3.46	0.04	2.08	1.06 - 4.10	0.03
Heart disease	1.92	0.98 - 3.79	0.06	3.18	1.56 - 6.48	0.00
<b>Pulmonary medication</b>						
Current use (ref: no medication)	6.11	2.60 - 14.39	<0.01	5.53	2.68 - 11.40	<0.01
<b>Injury Duration (years)</b>	1.01	0.99 - 1.02	0.50	1.01	0.99 - 1.03	0.56
<b>SCI Classification</b>						
Motor complete cervical & AIS C	1.17	0.68 - 2.01	0.57	0.48	0.22 - 1.02	0.06
Motor complete high thoracic & AIS C	0.65	0.33 - 1.29	0.22	0.83	0.37 - 1.90	0.66
Motor complete low thoracic & AIS C	0.63	0.35 - 1.14	0.13	0.80	0.39 - 1.63	0.53
All AIS D	ref			ref		

\* Android, % fat quartiles: 0- ≤ 36, >36- ≤ 45, >45- ≤ 52, >52%  
 Gynoid, % fat quartiles: 0- ≤ 34, >34- ≤ 40, >40- ≤ 47, >47%  
 Trunk, % fat quartiles: 0- ≤ 34, >34- ≤ 42, >42- ≤ 48, >48%  
 Total body, % fat quartiles: 0- ≤ 31, >31- ≤ 38, >38- ≤ 43, >43%

**SUPPLEMENTAL TABLE 2**

Univariable models of factors associated with chronic cough or chronic phlegm

	Chronic Cough			Chronic Phlegm		
	Odds Ratio	95% C.I.	p-value	Odds Ratio	95% C.I.	p-value
<b>Age (years)</b>	1.02	1.00 - 1.05	0.11	1.01	0.99 - 1.03	0.33
<b>Sex</b>						
Female (ref: Male)	1.13	0.47 - 2.72	0.78	0.34	0.12 - 0.99	0.05
<b>Race</b>						
Non-White (ref: White)	0.54	0.16 - 1.85	0.33	0.48	0.17 - 1.40	0.18
<b>Vitamin D Level (ng/mL)</b>	0.98	0.95 - 1.02	0.36	1.00	0.98 - 1.03	0.81
≥ 30 (normal)	ref			ref		
≥20 - <30 (insufficient)	1.05	0.43 - 2.57	0.91	0.85	0.42 - 1.72	0.65
<20 (deficient)	1.45	0.56 - 3.73	0.45	0.70	0.31 - 1.60	0.40
<b>Regional Fat*</b>						
Android, % fat	1.00	0.97 - 1.03	0.93	0.99	0.97 - 1.01	0.45
quartile 1 (lowest)	ref			ref		
quartile 2	1.27	0.47 - 3.38	0.64	0.81	0.34 - 1.93	0.64
quartile 3	0.89	0.31 - 2.57	0.82	1.12	0.49 - 2.56	0.78
quartile 4 (highest)	1.28	0.48 - 3.43	0.62	0.82	0.35 - 1.96	0.66
Gynoid, % fat	0.99	0.96 - 1.03	0.64	0.98	0.95 - 1.01	0.19
quartile 1 (lowest)	ref			ref		
quartile 2	0.92	0.34 - 2.46	0.86	0.98	0.41 - 2.33	0.96
quartile 3	1.14	0.46 - 2.85	0.77	1.53	0.70 - 3.35	0.29
quartile 4 (highest)	0.56	0.19 - 1.61	0.28	0.56	0.22 - 1.43	0.23
Trunk, % fat	1.00	0.97 - 1.03	0.89	0.98	0.96 - 1.01	0.25
quartile 1 (lowest)	ref			ref		
quartile 2	1.30	0.49 - 3.46	0.60	0.84	0.35 - 1.98	0.68
quartile 3	1.37	0.51 - 3.66	0.53	1.38	0.62 - 3.07	0.43
quartile 4 (highest)	0.95	0.33 - 2.74	0.92	0.72	0.29 - 1.79	0.48
Total body, % fat	1.00	0.96 - 1.04	0.86	0.98	0.96 - 1.02	0.45
quartile 1 (lowest)	ref			ref		
quartile 2	1.57	0.57 - 4.33	0.39	1.06	0.45 - 2.51	0.90
quartile 3	1.88	0.70 - 5.03	0.21	1.45	0.64 - 3.28	0.37
quartile 4 (highest)	0.87	0.28 - 2.70	0.81	0.83	0.34 - 2.05	0.69
<b>BMI (kg/m<sup>2</sup>)</b>	1.00	0.94 - 1.06	0.97	0.99	0.95 - 1.04	0.82
< 25 (normal or underweight)	ref			ref		
25-<30 (overweight)	1.33	0.57 - 3.11	0.51	0.85	0.41 - 1.75	0.65
≥30 (obese)	1.39	0.59 - 3.31	0.45	1.21	0.60 - 2.44	0.60
<b>Cigarette Smoking</b>						
Current ≥1/2 pack/day	5.06	1.67 - 15.31	0.00	6.84	2.61 - 17.95	<0.01
Current <1/2 pack/day	4.16	1.32 - 13.05	0.02	4.30	1.56 - 11.88	0.01
Former	1.96	0.81 - 4.79	0.14	2.17	1.01 - 4.66	0.05
Never	ref			ref		
<b>Marijuana</b>						
Current	1.22	0.44 - 3.37	0.71	1.70	0.75 - 3.84	0.20
Former	1.25	0.45 - 3.47	0.67	1.28	0.53 - 3.11	0.58
Never	ref			ref		
<b>Occupational dust or fume exposure</b>	1.30	0.64 - 2.66	0.47	1.94	1.02 - 3.69	0.04
<b>Medical conditions</b>						
Hay fever	1.70	0.80 - 3.65	0.17	0.97	0.47 - 2.00	0.94
Diabetes	2.16	0.95 - 4.93	0.07	1.73	0.82 - 3.66	0.15
Heart disease	1.30	0.47 - 3.56	0.62	1.02	0.41 - 2.57	0.97
<b>Pulmonary medication</b>						
Current use (ref: no medication)	4.16	1.81 - 9.56	<0.01	3.88	1.82 - 8.29	<0.01
<b>Injury Duration (years)</b>	1.02	1.00 - 1.05	0.06	1.00	0.98 - 1.02	0.80
<b>SCI Classification</b>						
Motor complete cervical & AIS C	0.56	0.21 - 1.48	0.24	0.91	0.44 - 1.90	0.81
Motor complete high thoracic & AIS C	1.07	0.40 - 2.87	0.90	0.59	0.21 - 1.64	0.31
Motor complete low thoracic & AIS C	0.68	0.26 - 1.79	0.43	0.73	0.32 - 1.65	0.45
All AIS D	ref			ref		

\* Android, % fat quartiles: 0- ≤ 36, >36- ≤ 45, >45- ≤ 52, >52%  
 Gynoid, % fat quartiles: 0- ≤ 34, >34- ≤ 40, >40- ≤ 47, >47%  
 Trunk, % fat quartiles: 0- ≤ 34, >34- ≤ 42, >42- ≤ 48, >48%  
 Total body, % fat quartiles: 0- ≤ 31, >31- ≤ 38, >38- ≤ 43, >43%

**SUPPLEMENTAL TABLE 3**

Multivariable models of factors associated with wheeze stratified by SCI severity and level

<b>Any Wheeze - Motor Complete and AIS C (n=197)</b>			
Characteristic	Odds Ratio	95% C.I.	p-value
<b>Hay fever (ref: never)</b>	1.63	0.80, 3.34	0.18
<b>Cigarette Smoking</b>			
current $\geq 1/2$ pack/day	10.43	2.62, 41.61	<0.01
current <1/2 pack/day	2.17	0.63, 7.42	0.22
former	1.66	0.86, 3.22	0.13
never	ref		
<b>BMI (kg/m<sup>2</sup>)</b>			
$\geq 30$ (obese)	2.27	1.01, 5.10	0.05
25-<30 (overweight)	1.40	0.68, 2.90	0.36
< 25 (normal or underweight)	ref		
<b>Vitamin D Level (ng/mL)</b>			
<20 (deficient)	0.62	0.27, 1.45	0.27
$\geq 20$ - <30 (insufficient)	0.82	0.40, 1.70	0.59
$\geq 30$ (normal)	ref		

<b>Any Wheeze - AIS D (n=146)</b>			
Characteristic	Odds Ratio	95% C.I.	p-value
<b>Hay fever (ref: never)</b>	2.25	0.92, 5.52	0.08
<b>Cigarette Smoking</b>			
current $\geq 1/2$ pack/day	4.05	1.09, 15.06	0.04
current <1/2 pack/day	2.19	0.66, 7.29	0.20
former	2.42	1.03, 5.67	0.04
never	ref		
<b>BMI (kg/m<sup>2</sup>)</b>			
$\geq 30$ (obese)	2.87	1.21, 6.82	0.02
25-<30 (overweight)	0.96	0.39, 2.34	0.92
< 25 (normal or underweight)	ref		
<b>Vitamin D Level (ng/mL)</b>			
<20 (deficient)	1.08	0.39, 2.99	0.88
$\geq 20$ - <30 (insufficient)	1.35	0.55, 3.29	0.51
$\geq 30$ (normal)	ref		

<b>Persistent Wheeze - Motor Complete and AIS C (n=197)</b>			
Characteristic	Odds Ratio	95% C.I.	p-value
<b>Heart disease last 10 yrs (ref: never)</b>	7.08	1.97, 25.44	<0.01
<b>Cigarette Smoking</b>			
current $\geq 1/2$ pack/day	11.65	2.99, 45.38	<0.01
current <1/2 pack/day	5.76	1.39, 23.94	0.02
former	1.12	0.40, 3.14	0.83
never	ref		
<b>BMI (kg/m<sup>2</sup>)</b>			
$\geq 30$ (obese)	3.37	1.06, 10.69	0.04
25-<30 (overweight)	1.54	0.54, 4.41,	0.42
< 25 (normal or underweight)	ref		
<b>Vitamin D Level (ng/mL)</b>			
<20 (deficient)	0.71	0.24, 2.11	0.53
$\geq 20$ - <30 (insufficient)	0.53	0.19, 1.49	0.23
$\geq 30$ (normal)	ref		

<b>Persistent Wheeze - AIS D (n=146)</b>			
Characteristic	Odds Ratio	95% C.I.	p-value
<b>Heart disease last 10 yrs (ref: never)</b>	1.70	0.60, 4.84	0.32
<b>Cigarette Smoking</b>			
current $\geq 1/2$ pack/day	3.09	0.75, 12.80	0.12
current <1/2 pack/day	1.72	0.41, 7.22	0.46
former	1.41	0.51, 3.88	0.50
never	ref		
<b>BMI (kg/m<sup>2</sup>)</b>			
$\geq 30$ (obese)	2.48	0.92, 6.64	0.07
25-<30 (overweight)	0.72	0.22, 2.31	0.58
< 25 (normal or underweight)	ref		
<b>Vitamin D Level (ng/mL)</b>			
<20 (deficient)	0.87	0.26, 2.89	0.83
$\geq 20$ - <30 (insufficient)	1.11	0.39, 3.15	0.84
$\geq 30$ (normal)	ref		

**SUPPLEMENTAL TABLE 4**

Multivariable models of factors associated with respiratory symptoms including vitamin D and pulmonary medication use

<b>Cough</b>				<b>Phlegm</b>			
Characteristic	Odds Ratio	95% C.I.	p-value	Characteristic	Odds Ratio	95% C.I.	p-value
<b>Injury duration</b>	1.02	1.00, 1.05	0.08	<b>Female (ref: Male)</b>	0.24	0.07, 0.77	0.02
<b>Cigarette Smoking</b>				<b>Cigarette Smoking</b>			
current $\geq 1/2$ pack/day	5.47	1.75, 17.14	<0.01	current $\geq 1/2$ pack/day	8.12	2.99, 22.02	<0.01
current <1/2 pack/day	3.47	1.06, 11.35	0.04	current <1/2 pack/day	3.76	1.30, 10.84	0.01
former	1.80	0.72, 4.49	0.21	former	1.89	0.85, 4.17	0.12
never	ref			never	ref		
<b>Pulmonary medication</b>				<b>Pulmonary medication</b>			
Current use (ref: no medication)	4.12	1.70, 9.97	<0.01	Current use (ref: no medication)	4.54	2.01, 10.28	<0.01
<b>Vitamin D Level (ng/mL)</b>				<b>Vitamin D Level (ng/mL)</b>			
<20 (deficient)	1.52	0.55, 4.15	0.42	<20 (deficient)	0.57	0.23, 1.39	0.22
$\geq 20$ - <30 (insufficient)	1.06	0.41, 2.72	0.90	$\geq 20$ - <30 (insufficient)	0.84	0.39, 1.78	0.64
$\geq 30$ (normal)	ref			$\geq 30$ (normal)	ref		
<b>Any Wheeze</b>				<b>Persistent Wheeze</b>			
Characteristic	Odds Ratio	95% C.I.	p-value	Characteristic	Odds Ratio	95% C.I.	p-value
<b>Hay fever (ref: never)</b>	1.70	0.96, 3.01	0.07	<b>Heart disease last 10 yrs (ref: never)</b>	3.07	1.37, 6.86	<0.01
<b>Cigarette Smoking</b>				<b>Cigarette Smoking</b>			
current $\geq 1/2$ pack/day	6.08	2.47, 14.93	<0.01	current $\geq 1/2$ pack/day	6.27	2.40, 16.384	<0.01
current <1/2 pack/day	1.79	0.77, 4.19	0.18	current <1/2 pack/day	2.51	0.90, 6.99	0.08
former	1.87	1.12, 3.14	0.02	former	1.35	0.66, 2.75	0.41
never	ref			never	ref		
<b>Pulmonary medication</b>				<b>Pulmonary medication</b>			
Current use (ref: no medication)	5.21	2.16, 12.59	<0.01	Current use (ref: no medication)	5.34	2.48, 11.50	<0.01
<b>BMI (kg/m<sup>2</sup>)</b>				<b>BMI (kg/m<sup>2</sup>)</b>			
>30 (obese)	2.27	1.26, 4.11	0.01	>30 (obese)	2.35	1.12, 4.94	0.02
25-30 (overweight)	1.14	0.65, 2.01	0.65	25-30 (overweight)	1.12	0.52, 2.43	0.78
< 25 (normal or underweight)	ref			< 25 (normal or underweight)	ref		
<b>Vitamin D Level (ng/mL)</b>				<b>Vitamin D Level (ng/mL)</b>			
<20 (deficient)	0.80	0.41, 1.55	0.50	<20 (deficient)	0.89	0.39, 2.03	0.79
$\geq 20$ - <30 (insufficient)	1.00	0.56, 1.78	1.00	$\geq 20$ - <30 (insufficient)	0.78	0.37, 1.65	0.52
$\geq 30$ (normal)	ref			$\geq 30$ (normal)	ref		

**SUPPLEMENTAL TABLE 5.**

Multivariable models of factors associated with any wheeze and persistent wheeze including effects of adiposity and pulmonary medication

Characteristic	ANY WHEEZE											
	Android			Gynoid			Trunk			Total Body		
	Odds Ratio	95% C.I.	p-value	Odds Ratio	95% C.I.	p-value	Odds Ratio	95% C.I.	p-value	Odds Ratio	95% C.I.	p-value
<b>Hay fever (ref: never)</b>	1.87	1.19, 3.61	0.03	1.78	1.00, 3.16	0.05	1.82	1.03, 3.22	0.04	1.74	0.99, 3.09	0.06
<b>Cigarette Smoking</b>												
current $\geq$ 1/2 pack/day	8.11	3.14, 20.94	<0.01	7.74	2.98, 20.07	<0.01	8.17	3.13, 21.28	<0.01	7.86	3.02, 20.46	<0.01
current <1/2 pack/day	1.98	0.83, 4.71	0.12	2.05	0.87, 4.85	0.10	1.96	0.83, 4.66	0.13	2.00	0.84, 4.76	0.12
former	2.21	1.30, 3.76	<0.01	2.11	1.27, 3.51	<0.01	1.95	1.17, 3.26	0.01	1.93	1.16, 3.22	0.01
never	ref			ref			ref			ref		
<b>Pulmonary medication</b>												
Current use (ref: no medication)	5.22	2.13, 12.79	<0.01	5.19	2.12, 12.69	<0.01	5.32	2.16, 13.07	<0.01	5.31	2.16, 13.05	<0.01
<b>Region %fat</b>												
quartile 1 (lowest)	ref			ref			ref			ref		
quartile 2	1.38	0.70, 2.72	0.35	1.95	0.98, 3.87	0.06	1.94	0.99, 3.82	0.06	2.38	1.20, 4.72	0.01
quartile 3	1.31	0.65, 2.65	0.46	2.21	1.13, 4.32	0.02	2.19	1.09, 4.39	0.03	2.41	1.21, 4.81	0.01
quartile 4 (highest)	2.99	1.50, 5.96	<0.01	1.80	0.93, 3.51	0.08	2.67	1.33, 5.35	<0.01	2.79	1.40, 5.60	<0.01
Characteristic	PERSISTENT WHEEZE											
	Android			Gynoid			Trunk			Total Body		
	Odds Ratio	95% C.I.	p-value	Odds Ratio	95% C.I.	p-value	Odds Ratio	95% C.I.	p-value	Odds Ratio	95% C.I.	p-value
<b>Heart disease last 10yrs (ref: never)</b>	3.45	1.55, 7.68	<0.01	3.40	1.52, 7.60	<0.01	3.32	1.50, 7.34	<0.01	3.17	1.44, 7.01	<0.01
<b>Cigarette Smoking</b>												
current $\geq$ 1/2 pack/day	7.42	2.73, 20.17	<.01	6.99	2.62, 18.65	<.01	7.14	2.64, 19.30	<0.01	6.99	2.58, 18.95	<0.01
current <1/2 pack/day	2.65	0.94, 7.49	0.07	2.51	0.88, 7.16	0.08	2.74	0.97, 7.75	0.06	2.59	0.91, 7.37	0.08
former	1.35	0.65, 2.79	0.42	1.34	0.66, 2.75	0.42	1.23	0.60, 2.51	0.57	1.24	0.61, 2.53	0.56
never	ref			ref			ref			ref		
<b>Pulmonary medication</b>												
Current use (ref: no medication)	5.40	2.45, 11.90	<.01	5.66	2.55, 12.57	<.01	5.39	2.46, 11.78	<0.01	5.59	2.54, 12.28	<0.01
<b>Region %fat</b>												
quartile 1 (lowest)	ref			ref			ref			ref		
quartile 2	0.95	0.39, 2.31	0.91	1.35	0.54, 3.36	0.53	1.23	0.50, 3.05	0.65	1.60	0.64, 4.02	0.32
quartile 3	1.43	0.57, 3.59	0.45	3.16	1.35, 7.40	<.01	2.68	1.12, 6.44	0.03	3.29	1.35, 8.02	<0.01
quartile 4 (highest)	2.28	0.97, 5.39	0.06	1.32	0.52, 3.31	0.56	1.98	0.80, 4.92	0.14	2.08	0.81, 5.36	0.13