

Supplementary Table 1. Specific respiratory symptoms stratified by physician-diagnosed asthma and BMI category*

Outcome, summary statistics		BMI category			P values for elevated vs normal weight within asthma strata	
		Normal weight (BMI <25 kg/m ²)	Overweight (BMI 25–29.9 kg/m ²)	Obesity (BMI ≥30 kg/m ²)	Overweight vs normal	Obesity vs normal
Q1: Wheezing or whistling in the chest in the last 12 months, -yes, n/n total in group (%)	No asthma	42/309 (13%)	41/255 (16%)	32/127 (25%)	0.41	0.003
	Asthma	126/228 (55%)	114/230 (49%)	105/168 (63%)	0.22	0.15
	P values for asthma vs no asthma within BMI categories	<0.001	<0.001	<0.001		
Q2: Wheezing or whistling with dyspnoea in the last 12 months, -yes n/n total in group (%)	No asthma	37/309 (12%)	26/255 (10%)	20/127 (16%)	0.51	0.29
	Asthma	108/228 (47%)	104/230 (45%)	95/168 (57%)	0.64	0.07
	P values for asthma vs no asthma within BMI categories	<0.001	<0.001	<0.001		
Q3: Wheezing or whistling in the chest without a cold in the last 12 months, -yes n/n total in group (%)	No asthma	30/309 (10%)	29/255 (11%)	23/127 (18%)	0.52	0.015
	Asthma	108/228 (47%)	93/230 (40%)	96/168 (57%)	0.14	0.05
	P values for asthma vs no asthma within BMI categories	<0.001	<0.001	<0.001		
Q4: Dyspnoea at rest in the last 12 months, -yes, n/n total in group (%)	No asthma	19/309 (6%)	12/255 (5%)	14/127 (11%)	0.45	0.08
	Asthma	154/228 (24%)	64/230 (28%)	53/168 (32%)	0.31	0.08
	P values for asthma vs no asthma within BMI categories	<0.001	<0.001	<0.001		
Q5: Dyspnoea after exposure to cold in the last 12 months, -yes, n/n total in group (%)	No asthma	19/309 (6%)	11/225 (4%)	16/127 (13%)	0.33	0.02
	Asthma	78/228 (34%)	78/230 (34%)	76/168 (45%)	0.95	0.03
	P values for asthma vs no asthma within BMI categories	<0.001	<0.001	<0.001		

Q6: Dyspnoea following strenuous activity in the last 12 months, -yes, n/n total in group (%)	No asthma Asthma	62/309 (20%) 125/228 (55%)	45/225 (18%) 119/230 (52%)	39/127 (31%) 110/168 (65%)	0.47 0.51	0.02 0.03
	P values for asthma vs no asthma within BMI categories	<0.001	<0.001	<0.001		
Q7: Woken by a coughing attack in the last 12 months, -yes, n/n total in group (%)	No asthma Asthma	65/309 (21%) 68/228 (30%)	49/225 (19%) 80/230 (35%)	28/127 (22%) 65/168 (39%)	0.59 0.26	0.82 0.07
	P values for asthma vs no asthma within BMI categories	0.02	<0.001	0.002		
Q8: Woken by a feeling of tightness in the chest in the last 12 months, -yes, n/n total in group (%)	No asthma Asthma	32/309 (10%) 80/228 (35%)	24/225 (9%) 81/230 (35%)	18/127 (14%) 65/168 (39%)	0.71 0.98	0.26 0.46
	P values for asthma vs no asthma within BMI categories	<0.001	<0.001	<0.001		
Q9: Woken by dyspnoea in the last 12 months, - n/n total in group (%)	No asthma Asthma	15/309 (5%) 41/228 (18%)	13/225 (5%) 42/230 (18%)	9/127 (7%) 33/168 (20%)	0.90 0.94	0.35 0.68
	P values for asthma vs no asthma within BMI categories	<0.001	<0.001	0.002		

*Statistically significant findings are shown as bold. P-values were based on the chi-square test. The distribution by BMI category for all 691 participants without asthma was 269 with normal weight, 230 with overweight, and 111 with obesity; for all 626 participants with asthma, 193 had normal weight, 202 had overweight, and 138 had obesity.

Supplementary Table 2. Association of specific respiratory symptoms with asthma, BMI categories, and tests of interaction

Health-related outcome, effect estimate	Coefficients from regression models (95% CI) ^a			Coefficients for interaction terms in regression models ^b for all outcomes and synergy Index for dichotomous outcomes			
	Asthma, yes vs no	Elevated BMI vs. normal weight		Interaction terms in regression models (95% CI) ^b		Synergy Index (95% CI) ^c	
		Overweight	Obesity	Asthma x overweight	Asthma x obesity	Asthma x overweight	Asthma x obesity
Q1: Wheezing or whistling in the chest in the last 12 months	6.0 (4.7, 7.8)	0.9 (0.7, 1.3)	1.6 (1.1, 2.2)	0.65 (0.36, 1.18)	0.61 (0.32, 1.19)	0.65 (0.43, 1.00) ^d	1.16 (0.74, 1.81)
Q2: Wheezing or whistling with dyspnoea in the past 12 months	6.9 (5.2, 9.1)	0.9 (0.7, 1.3)	1.4 (1.0, 2.0)	1.08 (0.56, 2.07)	1.02 (0.50, 2.09)	0.94 (0.60, 1.48)	1.40 (0.88, 2.23)
Q3: Wheezing or whistling in the chest without a cold in the last 12 months	6.8 (5.1, 9.0)	0.8 (0.6, 1.2)	1.6 (1.1, 2.2)	0.60 (0.31, 1.17)	0.69 (0.34, 1.43)	0.65 (0.42, 1.02) ^d	1.25 (0.79, 1.97)
Q4: Dyspnoea at rest in the last 12 months	5.4 (3.8, 7.7)	1.1 (0.7, 1.6)	1.4 (0.96, 2.2)	1.36 (0.76, 2.43)	1.15 (0.65, 2.02)	1.36 (0.76, 2.43)	1.15 (0.65, 2.02)
Q5: Dyspnoea after exposure to cold in the last 12 months	8.1 (5.7, 11)	0.9 (0.7, 1.4)	1.7 (1.2, 2.5)	1.06 (0.66, 1.72)	1.36 (0.85, 2.15)	1.06 (0.66, 1.72)	1.36 (0.85, 2.15)
Q6: Dyspnoea following strenuous activity in the last 12 months	4.8 (3.8, 6.2)	0.9 (0.6, 1.2)	1.6 (1.1, 2.2)	0.88 (0.54, 1.46)	1.31 (0.80, 2.15)	0.88 (0.54, 1.46)	1.31 (0.80, 2.15)
Q7: Woken by a coughing attack in the last 12 months	2.0 (1.5, 2.5)	1.2 (0.9, 1.6)	1.4 (0.98, 1.9)	1.84 (0.68, 5.02)	1.55 (0.57, 4.24)	1.84 (0.68, 5.02)	1.55 (0.57, 4.24)
Q8 :Woken by a feeling of tightness in the chest in the last 12 months	4.7 (3.5, 6.3)	1.0 (0.7, 1.4)	1.3 (0.9, 1.8)	1.06 (0.72, 1.55)	1.02 (0.60, 1.74)	1.06 (0.72, 1.55)	1.02 (0.60, 1.74)
Q9: Woken by dyspnoea in the last 12 months	4.1 (2.8, 6.1)	1.0 (0.6, 1.5)	1.1 (0.7, 1.7)	0.91 (0.55, 1.49)	0.86 (0.43, 1.71)	0.91 (0.55, 1.49)	0.86 (0.43, 1.71)

*Statistically significant findings are bolded. The operational definitions of asthma and BMI categories are described in the Methods section.

^a A separate regression model was fit for each outcome and included covariates for asthma, BMI categories, age, sex, smoking, and education.

^b A separate regression model was fit for each outcome and included covariates for asthma, BMI categories, asthma × BMI interaction, age, gender, smoking, and education. The coefficients for interaction terms test for interaction on multiplicative and additive scales for dichotomous outcomes.

^c Synergy Index is an indicator of additive interaction for dichotomous outcomes and has a null value of 1.0.

^d Results are borderline statistically significant, 0.05 < p < 0.10