

**Supplementary table 1.** Characteristics of participants in UK Biobank excluded from this study<sup>1</sup>.

	Women (N = 86,669)			Men (N = 87,779)			Total population
	Lifetime non-smokers	Ex-smoker	Current smoker	Lifetime non-smokers	Ex-smoker	Current smoker	
<b>N</b>	56,117	23,197	7,359	46,206	31,547	10,031	174,448
<b>Age</b> (years), median (IQR)	57 (49-63)	59 (51-63)	54 (47-61)	56 (48-62)	60 (53-65)	54 (47-61)	57 (49-63)
<b>Height</b> (cm), median (IQR)*	163 (158-167)	163 (159-167)	163 (158-167)	176 (172-181)	176 (172-181)	176 (171-180)	169 (162-176)
<b>Ethnicity</b> (%)							
Caucasian	91.3	97.2	94.3	92.8	96.0	91.3	93.5
Non-Caucasian	8.7	2.8	5.7	7.2	4.0	8.7	6.5
<b>Age started smoking</b> (years), median (IQR)**	-	17 (16-19)	17 (15-20)	-	16 (15-18)	16 (15-19)	17 (15-18)
<b>Duration smoked</b> (years), median (IQR)***	-	20 (12-30)	36 (29-42)	-	21 (13-30)	36 (28-44)	25 (15-35)
<b>Cigarettes smoked daily</b> , median (IQR)‡	-	15 (10-20)	14 (8-20)	-	20 (15-25)	15 (10-20)	20 (10-20)
<b>Pack-years</b> , median (IQR)†	-	14.4 (7.5-25.0)	22.0 (12.8-33.1)	-	19.0 (10.0-32.2)	27.0 (15.8-41.0)	19.0 (10.0-32.0)
<b>Body mass index</b> (kg/m <sup>2</sup> ), median (IQR) ¥	25.9 (23.2-29.6)	26.4 (23.7-29.9)	25.7 (23.0-29.4)	26.9 (24.7-29.6)	27.8 (25.5-30.5)	26.8 (24.4-29.6)	26.7 (24.1-29.8)
<b>Townsend deprivation index</b> , median (IQR)€	-2.3 (-3.7, 0.1)	-2.0 (-3.5, 0.7)	-0.3 (-2.7, 2.8)	-2.3 (-3.8, 0.2)	-2.1 (-3.6, 0.5)	-0.1 (-2.7, 3.1)	-2.1 (-3.6, 0.6)
<b>Fresh fruit daily intake</b> , %							
0-1 pieces	27.7	28.0	47.2	40.0	40.5	58.9	35.9
2-3 pieces	53.4	52.4	40.9	45.5	44.5	32.5	47.9
4+ pieces	18.9	19.6	11.9	14.5	15.0	8.6	16.2
<b>FVC</b> (L), median (IQR)	3.16 (2.72-3.62)	3.21 (2.78-3.66)	3.16 (2.70-3.66)	4.55 (3.95-5.17)	4.42 (3.83-5.03)	4.41 (3.77-5.06)	3.75 (3.08-4.57)
<b>FEV1</b> (L), median (IQR)	2.44 (2.09-2.81)	2.45 (2.10-2.81)	2.35 (1.95-2.76)	3.49 (3.00-3.97)	3.34 (2.85-3.83)	3.22 (2.69-3.78)	2.85 (2.33-3.47)
<b>FEV1/FVC &lt; LLN</b> (NHANES III) (%)	11.4	12.6	24.6	8.7	10.4	21.3	11.8

<sup>1</sup>Participants with at least two spiromgrams without cough and back-extrapolated volume <5% FVC (or <150mL if greater), but excluding those with FET ≥6s on best curve (highest FEV1 + FVC). Participants who used inhaler in the last hour, those with unknown smoking status or whose main type of tobacco smoked was cigars or pipes, and women who were pregnant are not included.

IQR, interquartile range. \*296 missing. \*\*23,990 missing. \*\*\*22,590 missing. ‡22,587 missing. †23,070 missing. ¥2,715 missing. €216 missing.

**Supplementary table 2.** Association of airflow obstruction with duration and intensity of smoking in ex-smokers compared with lifetime non-smokers.

Ex-smokers	Women			Men		
	N	% airflow obstruction	OR (95% CI)	N	% airflow obstruction	OR (95% CI)
<b>Cigarettes smoked daily</b>						
Lifetime non-smoker	88,459	6.4	Ref.	48,416	6.7	Ref.
1-10	10,036	7.7	1.19 (1.10-1.29)	5,316	7.9	1.18 (1.06-1.31)
11-20	17,058	11.0	1.76 (1.66-1.86)	14,710	9.0	1.35 (1.26-1.44)
21-30	3,032	15.2	2.54 (2.29-2.82)	4,653	12.3	1.89 (1.72-2.08)
31+	1,139	13.6	2.19 (1.84-2.60)	3,117	12.6	1.89 (1.68-2.12)
<b>Duration smoked (years)</b>						
Lifetime non-smoker	88,459	6.4	Ref.	48,416	6.7	Ref.
1-10	6,227	6.3	0.97 (0.87-1.08)	4,799	6.6	0.99 (0.88-1.12)
11-20	9,893	7.1	1.09 (1.01-1.19)	8,842	6.5	0.96 (0.88-1.05)
21-30	7,657	10.5	1.67 (1.55-1.81)	7,275	8.9	1.36 (1.24-1.49)
31-40	5,346	15.7	2.75 (2.54-2.99)	4,651	14.4	2.36 (2.15-2.59)
41+	1,994	25.7	5.45 (4.89-6.08)	2,194	22.5	4.15 (3.70-4.64)
<b>Pack-years smoked</b>						
Lifetime non-smoker	88,459	6.4	Ref.	48,416	6.7	Ref.
1-10	10,852	6.6	1.01 (0.93-1.10)	6,864	6.5	0.97 (0.87-1.07)
11-20	9,155	8.3	1.29 (1.19-1.40)	7,596	7.0	1.05 (0.95-1.15)
21-30	5,525	11.8	1.93 (1.77-2.10)	5,406	9.0	1.38 (1.24-1.52)
31-40	2,979	17.5	3.12 (2.82-3.45)	3,251	12.9	2.07 (1.86-2.32)
41+	2,397	24.3	4.79 (4.33-5.30)	4,446	17.8	2.97 (2.72-3.25)

Model 1: Adjusted for centre, age, ethnicity, standing height, Townsend deprivation index, and fresh fruit intake.

**Supplementary table 3.** Association of airflow obstruction with duration and intensity of smoking in current smokers compared with lifetime non-smokers.

Current smokers	Women			Men		
	N	% airflow obstruction	OR (95% CI)	N	% airflow obstruction	OR (95% CI)
<b>Cigarettes smoked daily</b>						
Lifetime non-smoker	88,459	6.4	Ref.	48,416	6.7	Ref.
1-10	4,761	17.6	2.99 (2.76-3.24)	2,883	14.8	2.39 (2.14-2.67)
11-20	5,482	24.9	4.50 (4.20-4.83)	4,535	22.4	3.83 (3.53-4.16)
21-30	809	31.6	6.16 (5.28-7.19)	1,264	29.4	5.45 (4.78-6.21)
31+	150	34.7	7.00 (4.98-9.85)	397	33.0	6.37 (5.13-7.91)
<b>Duration smoked (years)</b>						
Lifetime non-smoker	88,459	6.4	Ref.	48,416	6.7	Ref.
1-10	224	8.0	1.13 (0.69-1.83)	183	7.7	1.07 (0.62-1.85)
11-20	513	10.1	1.42 (1.06-1.90)	484	11.2	1.63 (1.22-2.18)
21-30	2,477	16.9	2.46 (2.19-2.76)	2,132	14.2	2.13 (1.87-2.44)
31-40	4,225	22.0	3.74 (3.45-4.06)	2,994	19.5	3.16 (2.85-3.49)
41+	3,656	29.7	6.38 (5.88-6.93)	3,294	30.4	5.82 (5.31-6.38)
<b>Pack-years smoked</b>						
Lifetime non-smoker	88,459	6.4	Ref.	48,416	6.7	Ref.
1-10	1,819	14.0	2.22 (1.93-2.54)	1,139	10.7	1.67 (1.38-2.03)
11-20	2,809	17.8	3.01 (2.71-3.33)	1,877	15.0	2.44 (2.14-2.79)
21-30	2,843	22.2	3.86 (3.51-4.24)	2,004	18.5	3.03 (2.68-3.42)
31-40	1,904	29.3	5.68 (5.11-6.31)	1,657	22.6	3.90 (3.44-4.41)
41+	1,645	32.9	6.91 (6.19-7.73)	2,301	33.7	6.58 (5.95-7.27)

Model 1: Adjusted for centre, age, ethnicity, standing height, Townsend deprivation index, and fresh fruit intake.

**Supplementary table 4.** Association of airflow obstruction with age at which participants started smoking.

Age started smoking	Women			Men		
	N	% airflow obstruction	OR (95% CI)	N	% airflow obstruction	OR (95% CI)
Lifetime non-smoker	88,459	6.4	Ref.	48,416	6.7	Ref.
<b>Ex-smokers</b>						
< 12 years	296	12.8	1.24 (0.87-1.78)	755	13.2	1.40 (1.10-1.77)
12-14 years	3,047	11.5	1.18 (1.02-1.36)	4,365	10.6	1.17 (1.03-1.34)
15-17 years	13,153	10.7	1.16 (1.05-1.28)	13,287	9.8	1.12 (1.01-1.24)
18-20 years	10,416	9.8	1.09 (0.99-1.20)	6,969	9.0	1.03 (0.92-1.16)
21+ years	4,183	10.5	1.17 (1.03-1.33)	2,339	8.7	0.99 (0.84-1.17)
Lifetime non-smoker	88,459	6.4	Ref.	48,416	6.7	Ref.
<b>Current smokers</b>						
< 12 years	217	25.3	2.60 (1.86-3.65)	375	28.0	2.76 (2.11-3.60)
12-14 years	1,362	25.7	2.88 (2.44-3.41)	1,553	24.9	2.54 (2.15-3.02)
15-17 years	4,000	25.0	3.02 (2.67-3.42)	3,168	23.4	2.51 (2.19-2.88)
18-20 years	2,556	21.9	2.61 (2.29-2.99)	1,603	20.3	2.20 (1.87-2.58)
21+ years	1,754	19.2	2.27 (1.96-2.64)	1,134	17.9	1.93 (1.61-2.32)

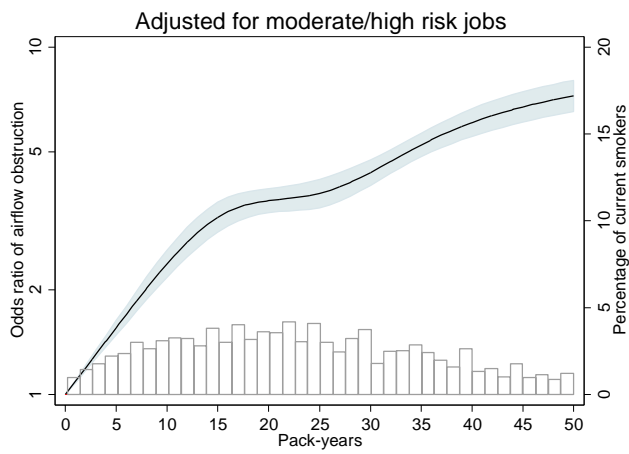
Model 1: Adjusted for centre, age, ethnicity, standing height, Townsend deprivation index, fresh fruit intake, and cigarettes per day.

**Supplementary table 5.** Association of airflow obstruction with time since quitting smoking.

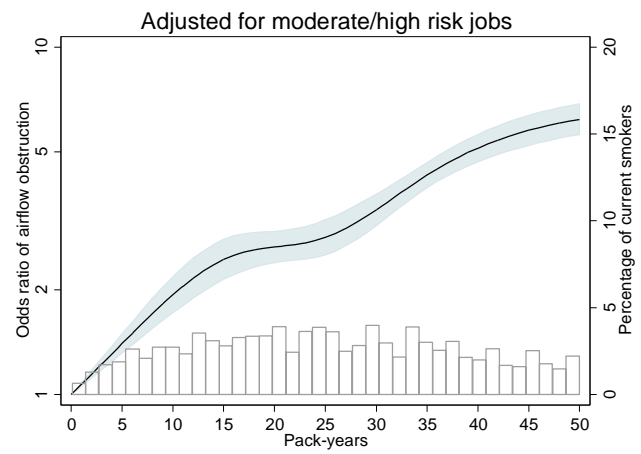
Time since quitting	Women			Men		
	N	% airflow obstruction	OR (95% CI)	N	% airflow obstruction	OR (95% CI)
Current smokers	9,889	23.3	Ref.	7,833	22.5	Ref.
<b>Ex-smokers</b>						
< 10 years ago	8,758	16.2	0.60 (0.56-0.65)	6,983	15.1	0.56 (0.51-0.61)
10-19 years ago	7,325	11.2	0.45 (0.41-0.49)	6,162	10.6	0.38 (0.35-0.43)
20-29 years ago	8,597	7.1	0.30 (0.27-0.33)	7,417	7.2	0.26 (0.23-0.29)
30+ years ago	6,307	6.1	0.26 (0.23-0.29)	7,075	6.4	0.24 (0.21-0.27)

Model 1: Adjusted for centre, age, ethnicity, standing height, Townsend deprivation index, fresh fruit intake, pack-years, and age started smoking.

### Women (current smoker)

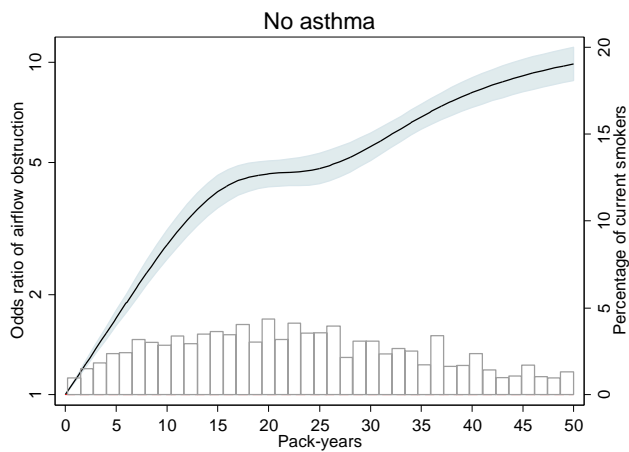


### Men (current smoker)

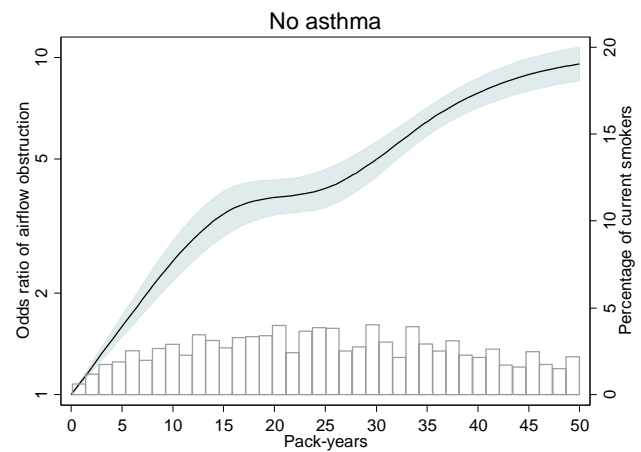


**Supplementary figure 1.** Association of airflow obstruction with pack-years ( $p$ -interaction =  $1.3 \times 10^{-6}$ ) among current smokers. Adjusted for centre, age, ethnicity, standing height, Townsend deprivation index, fresh fruit intake, and moderate/high risk jobs. Reference group: Lifetime non-smokers. Shaded area represents 95% confidence interval. Bars show the distribution of pack-years among current smokers.

### Women (current smoker)

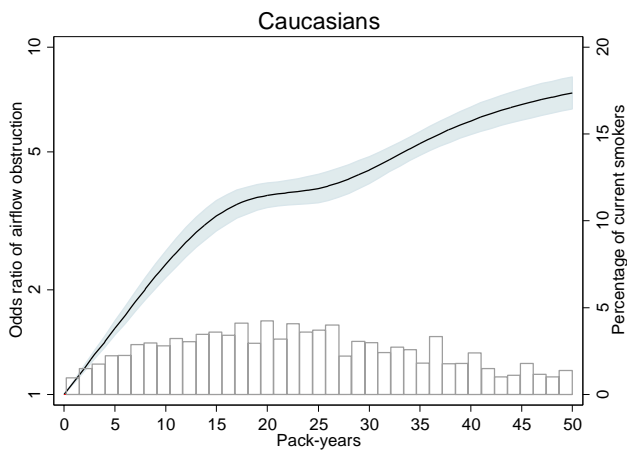


### Men (current smoker)

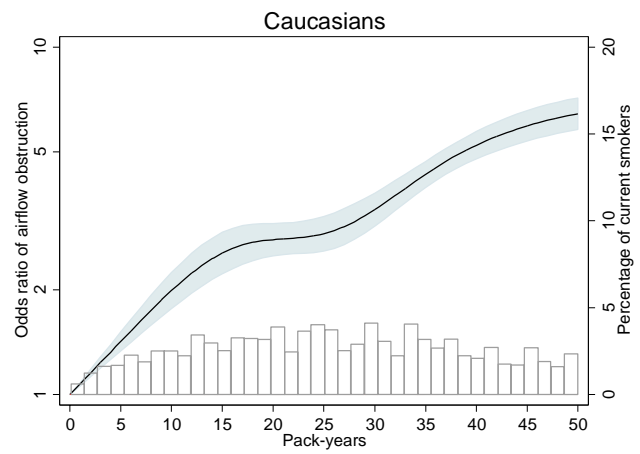


**Supplementary figure 2.** Association of airflow obstruction with pack-years ( $p$ -interaction = 0.04) among current smokers after exclusion of participants with self-reported asthma. Adjusted for centre, age, ethnicity, standing height, Townsend deprivation index, and fresh fruit intake. Reference group: Lifetime non-smokers. Shaded area represents 95% confidence interval. Bars show the distribution of pack-years among current smokers.

### Women (current smoker)

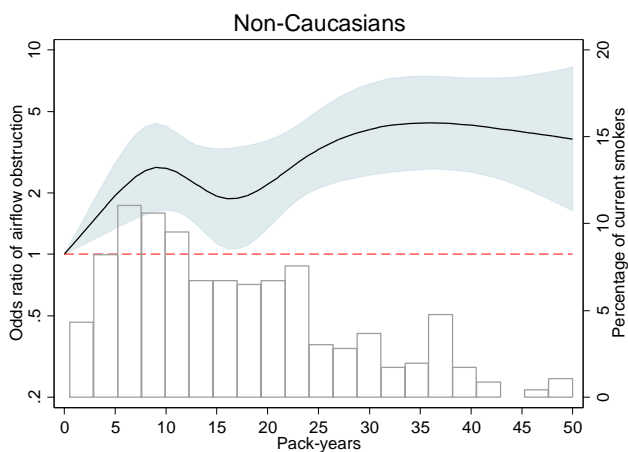


### Men (current smoker)

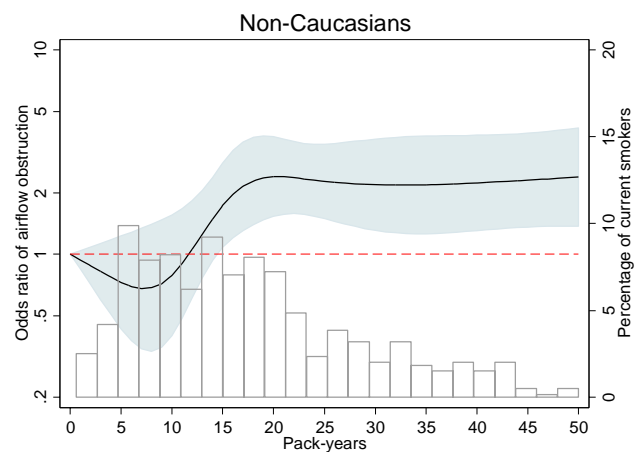


**Supplementary figure 3.** Association of airflow obstruction with pack-years ( $p$ -interaction =  $9.9 \times 10^{-6}$ ) among Caucasian current smokers. Adjusted for centre, age, ethnicity, standing height, Townsend deprivation index, and fresh fruit intake. Reference group: Lifetime non-smokers. Shaded area represents 95% confidence interval. Bars show the distribution of pack-years among current smokers.

### Women (current smoker)

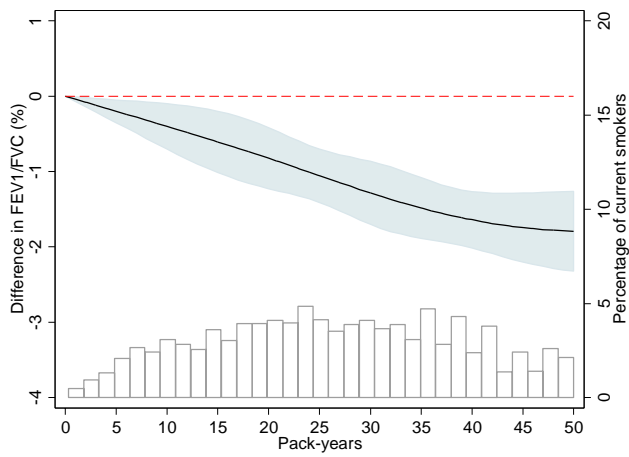


### Men (current smoker)

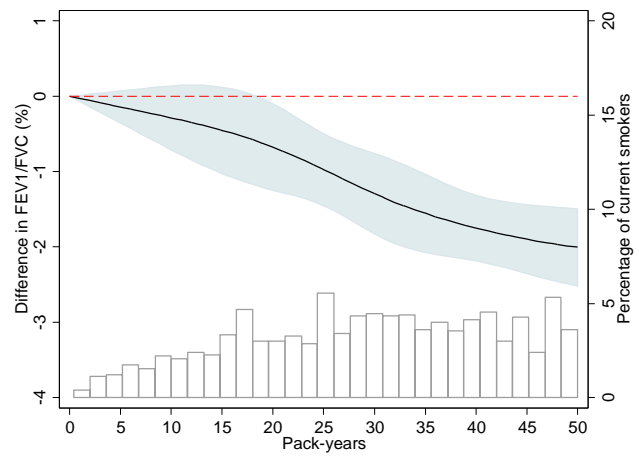


**Supplementary figure 4.** Association of airflow obstruction with pack-years ( $p$ -interaction = 0.02) among non-Caucasian current smokers. Adjusted for centre, age, ethnicity, standing height, Townsend deprivation index, and fresh fruit intake. Reference group: Lifetime non-smokers. Shaded area represents 95% confidence interval. Bars show the distribution of pack-years among current smokers.

### Women (current smoker)

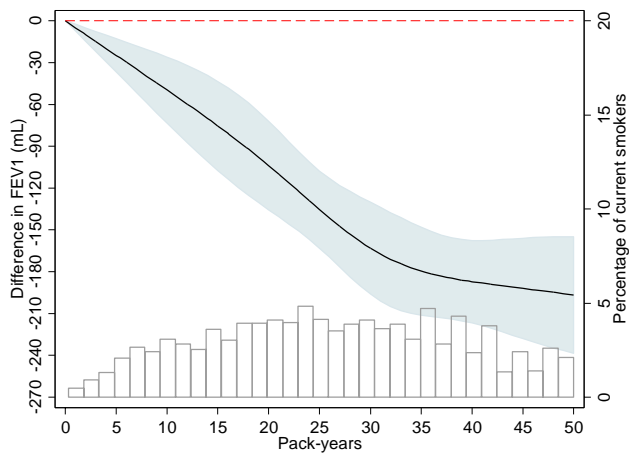


### Men (current smoker)

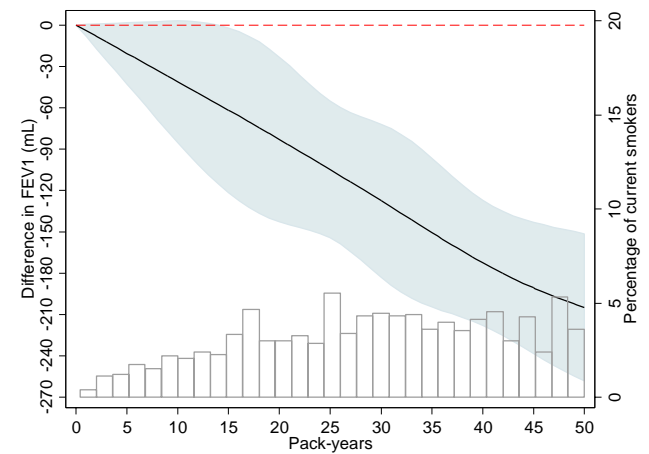


**Supplementary figure 5.** Association of FEV1/FVC decline with pack-years (p-interaction = 0.74) among current smokers with airflow obstruction. Adjusted for centre, age, ethnicity, standing height, Townsend deprivation index, and fresh fruit intake. Reference group: Lifetime non-smokers. Shaded area represents 95% confidence interval. Bars show the distribution of pack-years among current smokers with airflow obstruction.

### Women (current smoker)



### Men (current smoker)



**Supplementary figure 6.** Association of FEV1 decline with pack-years (p-interaction = 0.17) among current smokers with airflow obstruction. Adjusted for centre, age, ethnicity, standing height, Townsend deprivation index, and fresh fruit intake. Reference group: Lifetime non-smokers. Shaded area represents 95% confidence interval. Bars show the distribution of pack-years among current smokers with airflow obstruction.