

## **Online Supplement**

### **Title**

Lower lung function associates with cessation of menstruation: UK Biobank data

### **Authors**

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**Supplementary table S1** shows that ever users of hormonal replacement therapy (HRT) were more likely to be ever smokers and heavier than those who have never taken HRT.

**Supplementary table S2** summarizes the characteristics of women from UK Biobank excluded from this study due to low quality of spirometry, and shows that these women were similar to those included in this analyses.

**Supplementary table S3** shows how the differences in lung function between women who had undergone either natural or surgical cessation of menstruation and women still menstruating are explained by demographic (model 1), plus reproductive (model 2), and lifestyle-related characteristics (model 3).

**Supplementary table S4** shows that our main findings are unlikely to be confounded by ethnicity, smoking status, body mass index (BMI), asthma, COPD, or use of HRT. The exception to this is the association of airflow obstruction (FEV1/FVC<LLN) with hysterectomy with or without oophorectomy which seems to be explained by smoking, BMI, and use of HRT.

**Supplementary table S5** shows that among postmenopausal women, the earlier they underwent natural menopause, the lower their FVC. This finding is unlikely to be affected by HRT, smoking or BMI.

**Supplementary table S6** shows that among postmenopausal women, the earlier they underwent natural menopause, the lower their FEV1. This finding is unlikely to be affected by HRT, smoking or BMI.

**Supplementary table S7** shows that among postmenopausal women, the earlier they underwent natural menopause, the higher their risk of spirometric restriction (FVC<LLN). This finding is unlikely to be affected by HRT, smoking or BMI.

**Supplementary table S8** shows that among postmenopausal women there was no clear association of airflow obstruction with age at natural menopause. This finding is unlikely to be affected by HRT, smoking or BMI.

**Supplementary table S9** shows that among women who had hysterectomy, and never used HRT, there was no clear association of lung function (FVC, FEV1, FVC<LLN, FEV1/FVC<LLN) with age at hysterectomy.

**Supplementary table S10** shows that among women who had oophorectomy+hysterectomy, and never used HRT, there was no clear association of lung function (FVC, FEV1, FVC<LLN, FEV1/FVC<LLN) with age at oophorectomy+hysterectomy.

**Supplementary table S1.** Distribution of body mass index and smoking status according to hormonal replacement therapy status.

	<b>HRT</b>	
	<b>Never users</b>	<b>Ever users</b>
<b>BMI (kg/m<sup>2</sup>), median (IQR)*</b>	25.8 (23.2-29.4)	26.3 (23.8-29.6)
<b>BMI (kg/m<sup>2</sup>), (%)*</b>		
<18.5	0.6	0.4
18.5-24.99	41.4	35.9
25.00-29.99	35.8	40.4
30+	22.2	23.3
<b>Smoking status (%)**</b>		
Lifetime non-smoker	63.3	53.9
Ex-smoker	28.1	37.3
Current smoker	8.6	8.8

IQR, interquartile range. \*1,765 missing. \*\*2,611 missing.

**Supplementary table S2.** Characteristics of women in UK Biobank excluded from this study (with at least two spirograms without cough and back-extrapolated volume <5% FVC (or <150mL if greater), but excluding those with FET ≥6s on best curve (highest FEV1 + FVC)). Women who: 1) used inhaler in the last hour; 2) were unsure whether they had menopause; 3) were pregnant; 4) had gynaecological cancer; and 5) reported an age at menopause <35 or >65 are not included.

	Regular menstruation	Irregular menstruation	Natural menopause	Surgical interventions before menopause			Total population
				Hysterectomy only	Oophorectomy only	Oophorectomy + hysterectomy	
<b>N</b>	18,381	3,728	47,152	7,126	142	5,710	82,239
<b>Age</b> (years), median (IQR)	45 (43-48)	47 (44-50)	61 (56-64)	60 (55-65)	57 (50-62)	61 (55-65)	57 (49-63)
<b>Age at menarche</b> (years), median (IQR)‡	13 (12-14)	13 (12-14)	13 (12-14)	13 (12-14)	13 (12-14)	13 (12-14)	13 (12-14)
<b>Age at cessation of menstruation</b> (years), median (IQR)*	-	-	50 (48-53)	41 (37-45)	42 (37-50)	45 (40-50)	-
<b>Ethnicity</b> (%)							
White	89.5	93.1	94.6	93.7	86.6	93.2	93.2
Non-White	10.5	6.9	5.4	6.3	13.4	6.8	6.8
<b>Standing height</b> (cm), median (IQR)**	164 (160-169)	164 (160-169)	162 (158-166)	162 (158-166)	161 (158-166)	162 (158-166)	163 (158-167)
<b>BMI</b> (kg/m <sup>2</sup> ), median (IQR)***	25.0 (22.4-28.6)	25.3 (22.7-29.2)	26.1 (23.5-29.6)	27.2 (24.4-30.8)	27.2 (24.0-31.1)	27.4 (24.5-31.1)	26.0 (23.3-29.6)
<b>Oral contraceptive (ever) use</b> (%)†	87.1	89.7	76.9	77.9	73.9	76.2	79.8
<b>Hormone replacement therapy</b> (%)π							
Never used	96.9	96.0	57.4	42.4	53.9	16.7	63.9
Ex-user	1.9	2.7	37.9	47.6	37.6	63.9	30.9
Current user	1.2	1.3	4.7	10.0	8.5	19.4	5.2
<b>Live births</b> (%)÷							
0	27.0	25.5	17.8	11.7	19.7	16.5	19.6
1-2	54.0	55.7	57.6	57.6	57.8	57.2	56.7
3-4	17.7	18.0	22.8	28.4	21.1	24.1	22.0
5+	1.3	0.8	1.7	2.4	1.4	2.2	1.7
<b>Smoking status</b> (%)****							
Lifetime non-smoker	69.1	69.7	63.3	63.7	69.3	63.8	64.9
Ex-smoker	21.3	21.3	29.1	28.2	17.1	27.8	26.8
Current smoker	9.6	9.0	7.6	8.1	13.6	8.4	8.3
<b>Pack-years</b> , median (IQR)¥	12.2 (6.8-20.2)	13.0 (7.0-21.9)	18.0 (9.0-30.0)	19.5 (9.8-30.8)	22.0 (10.8-33.9)	19.5 (10.0-31.3)	16.5 (8.5-28.0)
<b>Townsend deprivation index</b> , median (IQR) €	-1.8 (-3.5, 1.0)	-2.05 (-3.6, 0.6)	-2.2 (-3.7, 0.3)	-2.2 (-3.7, 0.3)	-1.0 (-3.3, 1.9)	-2.1 (-3.6, 0.6)	-2.1 (-3.6, 0.5)
<b>FVC</b> (L), median (IQR)	3.54 (3.11-3.99)	3.49 (3.09-3.92)	3.05 (2.65-3.48)	3.04 (2.62-3.48)	3.06 (2.57-3.55)	3.00 (2.58-3.43)	3.17 (2.73-3.63)
<b>FVC %predicted</b> , median (IQR)	96.1 (86.1-105.7)	95.7 (86.3-105.2)	94.0 (83.5-104.6)	93.3 (82.3-104.0)	91.0 (80.2-102.7)	92.3 (81.7-102.9)	94.4 (84.0-104.7)
<b>FEV1</b> (L/s), median (IQR)	2.78 (2.43-3.11)	2.74 (2.42-3.08)	2.32 (2.00-2.65)	2.33 (1.99-2.66)	2.33 (1.81-2.73)	2.30 (1.96-2.62)	2.43 (2.08-2.80)
<b>FEV1 %predicted</b> , median (IQR)	94.1 (84.2-103.6)	94.7 (84.7-104.2)	92.8 (81.7-103.2)	92.4 (80.9-102.7)	89.2 (73.1-100.8)	91.4 (80.6-102.0)	93.0 (82.3-103.2)
<b>FVC &lt; LLN</b> (%)	15.8	15.4	17.8	20.0	22.5	21.2	17.7
<b>FEV1/FVC &lt; LLN</b> (%)	13.1	10.8	13.1	12.2	16.2	12.0	12.8
<b>Doctor-diagnosed asthma</b> (%)	10.6	11.0	8.8	12.1	12.9	12.0	9.8
<b>Wheeze in last year</b> (%)	14.9	15.4	15.2	20.0	30.7	20.0	15.9
<b>Doctor-diagnosed COPD</b> (%)	0.04	0.05	0.19	0.25	0.70	0.30	0.16

IQR, interquartile range. ₺2,613 missing (regular: 595; irregular: 140; natural: 1,484; hysterectomy only: 174; oophorectomy only: 2; oophorectomy + hysterectomy: 218). \*3,324 missing (natural: 2,897; hysterectomy only: 214; oophorectomy only: 26; oophorectomy + hysterectomy: 187). \*\*93 missing (regular: 16; irregular: 5; natural: 55; hysterectomy only: 8; oophorectomy + hysterectomy: 9). \*\*\*1,214 missing (regular: 231; irregular: 49; natural: 741; hysterectomy only: 100; oophorectomy only: 4; oophorectomy + hysterectomy: 89). †259 missing (regular: 71; irregular: 15; natural: 134; hysterectomy only: 12; oophorectomy + hysterectomy: 27). ‡327 missing (regular: 86; irregular: 17; natural: 168; hysterectomy only: 32; oophorectomy only: 1; oophorectomy + hysterectomy: 23). †88 missing (regular: 22; irregular: 1; natural: 55; hysterectomy only: 5; oophorectomy + hysterectomy: 5). \*\*\*\*1,552 missing (regular: 277; irregular: 51; natural: 972; hysterectomy only: 150; oophorectomy only: 2; oophorectomy + hysterectomy: 100). ¥10,857 missing (natural: 2,357; irregular: 433; natural: 6,382; hysterectomy only: 898; oophorectomy only: 17; oophorectomy + hysterectomy: 770). €95 missing (regular: 24; irregular: 5; natural: 57; hysterectomy only: 3; oophorectomy + hysterectomy: 6).

**Supplementary table S3.** Association of lung function with menstrual status.

	<b>Unadjusted (N = 141,076)</b>	<b>Model 1 (N = 140,833)</b>	<b>Model 2 (N = 136,388)</b>	<b>Model 3 (N = 115,848)</b>
	<b>Difference (95% CI)</b>	<b>Difference (95% CI)</b>	<b>Difference (95% CI)</b>	<b>Difference (95% CI)</b>
<b>FVC (mL)</b>				
Regular menstruation	Ref.	Ref.	Ref.	Ref.
Irregular menstruation	-53 (-69, -37)	-29 (-42, -16)	-28 (-41, -15)	-17 (-31, -3)
Natural menopause	-483 (-491, -475)	-51 (-62, -41)	-50 (-61, -39)	-42 (-53, -30)
Hysterectomy only	-493 (-505, -480)	-75 (-88, -63)	-76 (-89, -64)	-51 (-64, -37)
Oophorectomy only	-499 (-578, -421)	-115 (-178, -51)	-120 (-185, -55)	-90 (-159, -20)
Oophorect. + hysterect.	-519 (-532, -505)	-86 (-99, -73)	-86 (-100, -72)	-54 (-69, -39)
<b>FEV1 (mL/s)</b>				
Regular menstruation	Ref.	Ref.	Ref.	Ref.
Irregular menstruation	-45 (-58, -31)	-18 (-30, -7)	-19 (-30, -7)	-12 (-24, 0)
Natural menopause	-441 (-448, -435)	-47 (-56, -38)	-45 (-54, -36)	-34 (-43, -24)
Hysterectomy only	-434 (-444, -424)	-53 (-64, -43)	-51 (-62, -41)	-32 (-43, -20)
Oophorectomy only	-409 (-473, -345)	-65 (-119, -12)	-66 (-121, -12)	-46 (-105, 12)
Oophorect. + hysterect.	-456 (-467, -445)	-63 (-74, -52)	-57 (-69, -45)	-33 (-46, -21)
	<b>OR (95% CI)</b>	<b>OR (95% CI)</b>	<b>OR (95% CI)</b>	<b>OR (95% CI)</b>
<b>FVC &lt; LLN</b>				
Regular menstruation	Ref.	Ref.	Ref.	Ref.
Irregular menstruation	1.10 (1.01-1.19)	1.20 (1.10-1.31)	1.19 (1.09-1.30)	1.16 (1.05-1.28)
Natural menopause	1.30 (1.25-1.36)	1.33 (1.25-1.42)	1.33 (1.24-1.42)	1.27 (1.18-1.37)
Hysterectomy only	1.44 (1.36-1.53)	1.46 (1.35-1.58)	1.47 (1.36-1.60)	1.31 (1.20-1.43)
Oophorectomy only	2.06 (1.49-2.84)	1.93 (1.37-2.71)	2.01 (1.42-2.84)	1.69 (1.14-2.50)
Oophorect. + hysterect.	1.52 (1.43-1.62)	1.54 (1.42-1.67)	1.57 (1.44-1.71)	1.36 (1.24-1.50)
<b>FEV1/FVC &lt; LLN</b>				
Regular menstruation	Ref.	Ref.	Ref.	Ref.
Irregular menstruation	0.89 (0.80-0.98)	0.94 (0.84-1.04)	0.95 (0.85-1.05)	0.95 (0.85-1.06)
Natural menopause	0.97 (0.93-1.02)	1.15 (1.06-1.25)	1.14 (1.04-1.23)	1.03 (0.94-1.13)
Hysterectomy only	0.82 (0.76-0.89)	0.94 (0.85-1.03)	0.90 (0.82-1.00)	0.86 (0.77-0.96)
Oophorectomy only	0.50 (0.26-0.94)	0.56 (0.30-1.07)	0.58 (0.31-1.11)	0.64 (0.33-1.23)
Oophorect. + hysterect.	0.87 (0.80-0.95)	1.00 (0.90-1.11)	0.93 (0.84-1.04)	0.87 (0.77-0.98)

Model 1: Adjusted for centre, age, ethnicity, standing height, and Townsend deprivation index. Model 2: Model 1 plus age at menarche, oral contraceptive use, hormone replacement therapy use, and number of live births. Model 3: Model 2 plus smoking status, pack-years, and body mass index.

**Supplementary table S4.** Association of lung function with menstrual status, after sensitivity analysis.

	White ethnicity (N = 110,475)	Lifetime non-smoker (N = 78,739)	18.5 to 29.99 kg/m <sup>2</sup> (N = 88,555)	Without asthma/COPD (N = 101,519)	Never used HRT (N = 71,397)	White ethnicity + lifetime non-smoker + 18.5 to 29.99 kg/m <sup>2</sup> + without asthma/COPD + never used HRT (N = 33,406)
	Difference (95% CI)	Difference (95% CI)	Difference (95% CI)	Difference (95% CI)	Difference (95% CI)	Difference (95% CI)
<b>FVC (mL)</b>						
Regular menstruation	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Irregular menstruation	-22 (-36, -7)	-20 (-37, -4)	-15 (-31, 1)	-18 (-33, -3)	-19 (-34, -5)	-29 (-50, -8)
Natural menopause	-41 (-52, -29)	-40 (-54, -27)	-45 (-58, -32)	-39 (-51, -27)	-42 (-55, -29)	-38 (-58, -19)
Hysterectomy only	-49 (-63, -35)	-49 (-65, -32)	-55 (-71, -39)	-49 (-63, -34)	-58 (-75, -40)	-61 (-88, -34)
Oophorectomy only	-101 (-173, -28)	-75 (-163, 12)	-109 (-191, -26)	-74 (-148, 0)	-136 (-234, -38)	-118 (-277, 40)
Oophorect. + hysterect.	-52 (-67, -36)	-50 (-68, -32)	-57 (-74, -39)	-54 (-70, -38)	-59 (-87, -30)	-60 (-106, -14)
<b>FEV1 (mL/s)</b>						
Regular menstruation	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Irregular menstruation	-16 (-29, -4)	-13 (-27, 1)	-11 (-25, 2)	-12 (-24, 1)	-14 (-26, -2)	-21 (-38, -4)
Natural menopause	-32 (-42, -22)	-29 (-40, -17)	-37 (-48, -26)	-32 (-42, -22)	-36 (-48, -25)	-27 (-43, -10)
Hysterectomy only	-31 (-42, -19)	-27 (-41, -13)	-36 (-49, -22)	-31 (-43, -19)	-44 (-58, -29)	-42 (-64, -20)
Oophorectomy only	-55 (-116, -19)	-37 (-110, 36)	-52 (-122, 17)	-32 (-94, 29)	-68 (-150, 15)	-52 (-182, 78)
Oophorect. + hysterect.	-31 (-44, -18)	-28 (-43, -13)	-36 (-51, -22)	-35 (-48, -22)	-38 (-62, -13)	-34 (-71, 4)
	<b>OR (95% CI)</b>	<b>OR (95% CI)</b>	<b>OR (95% CI)</b>	<b>OR (95% CI)</b>	<b>OR (95% CI)</b>	<b>OR (95% CI)</b>
<b>FVC &lt; LLN (NHANES III)</b>						
Regular menstruation	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Irregular menstruation	1.21 (1.09-1.33)	1.13 (1.01-1.27)	1.15 (1.03-1.30)	1.17 (1.05-1.30)	1.17 (1.06-1.29)	1.19 (1.00-1.40)
Natural menopause	1.27 (1.17-1.38)	1.24 (1.14-1.36)	1.33 (1.21-1.46)	1.27 (1.17-1.38)	1.27 (1.17-1.39)	1.32 (1.13-1.54)
Hysterectomy only	1.31 (1.19-1.44)	1.24 (1.11-1.38)	1.35 (1.21-1.50)	1.28 (1.16-1.41)	1.33 (1.20-1.49)	1.28 (1.04-1.58)
Oophorectomy only	1.84 (1.22-2.77)	1.23 (0.72-2.12)	1.96 (1.22-3.14)	1.61 (1.04-2.50)	1.74 (1.01-2.99)	1.23 (0.37-4.10)
Oophorect. + hysterect.	1.36 (1.23, 1.50)	1.29 (1.14-1.45)	1.41 (1.25-1.59)	1.39 (1.25-1.54)	1.34 (1.13-1.58)	1.28 (0.91-1.80)
<b>FEV1/FVC &lt; LLN (NHANES III)</b>						
Regular menstruation	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Irregular menstruation	0.96 (0.85-1.08)	0.94 (0.81-1.08)	0.96 (0.85-1.09)	0.93 (0.80-1.07)	0.95 (0.85-1.07)	0.93 (0.77-1.14)
Natural menopause	1.02 (0.93-1.13)	1.01 (0.90-1.14)	1.06 (0.96-1.17)	1.03 (0.92-1.15)	1.04 (0.93-1.15)	0.97 (0.80-1.18)
Hysterectomy only	0.87 (0.77-0.97)	0.87 (0.74-1.01)	0.89 (0.78-1.00)	0.83 (0.73-0.96)	1.01 (0.88-1.17)	0.97 (0.74-1.28)
Oophorectomy only	0.61 (0.30-1.21)	0.58 (0.21-1.59)	0.64 (0.30-1.33)	0.48 (0.19-1.19)	0.78 (0.33-1.83)	0.53 (0.07-3.93)
Oophorect. + hysterect.	0.86 (0.76-0.98)	0.87 (0.73-1.03)	0.94 (0.82-1.07)	0.86 (0.74-1.00)	0.92 (0.72-1.17)	1.05 (0.66-1.66)

Model 3: Adjusted for centre, age, ethnicity, standing height, Townsend deprivation index, age at menarche, oral contraceptive use, hormone replacement therapy use, number of live births, smoking status, pack-years, and body mass index.

**Supplementary table S5.** Association of forced vital capacity (FVC) with age at natural menopause, by age group.

	40-55 years		56-59 years		60-62 years		63-65 years		66-70 years	
	N	Difference (95% CI)	N	Difference (95% CI)	N	Difference (95% CI)	N	Difference (95% CI)	N	Difference (95% CI)
<b>FVC (mL)</b>										
Natural menopause at <45 years	1976	-48 (-74, -22)	1041	-52 (-82, -22)	1053	-36 (-65, -7)	1010	-23 (-53, 6)	1000	-41 (-71, -12)
Natural menopause at 45-47 years	2324	-25 (-48, -2)	1282	-23 (-51, 4)	1297	-5 (-32, 21)	1105	-1 (-29, 27)	1284	-12 (-39, 14)
Natural menopause at 48-53 years	9788	Ref.	8174	Ref.	7309	Ref.	5779	Ref.	5743	Ref.
Natural menopause at 54-55 years	703	10 (-27, 48)	2612	0 (-20, 20)	2351	-16 (-37, 4)	1831	7 (-16, 30)	1498	-10 (-35, 15)
Natural menopause at 56+ years	-	-	1147	-5 (-34, 23)	1710	-9 (-32, 15)	1393	21 (-5, 46)	1296	8 (-18, 35)
	p-trend = 4.5x10 <sup>-6</sup>		p-trend = 0.004		p-trend = 0.3		p-trend = 0.006		p-trend = 5.7x10 <sup>-4</sup>	
<b>FVC (mL) – excluding HRT ever users</b>										
Natural menopause at <45 years	992	-71 (-107, -35)	332	-70 (-121, -18)	361	-36 (-85, 12)	373	-27 (-74, 21)	508	-49 (-91, -7)
Natural menopause at 45-47 years	1656	-24 (-51, 3)	638	-36 (-74, 2)	558	-15 (-55, 25)	474	5 (-37, 48)	623	-2 (-41, 36)
Natural menopause at 48-53 years	7773	Ref.	5189	Ref.	3881	Ref.	2745	Ref.	2859	Ref.
Natural menopause at 54-55 years	573	35 (-8, 78)	1765	-2 (-27, 22)	1223	-30 (-58, -1)	845	22 (-12, 55)	696	30 (-7, 67)
Natural menopause at 56+ years	-	-	791	-5 (-39, 30)	877	-9 (-42, 24)	621	35 (-3, 73)	561	25 (-16, 65)
	p-trend = 8.2x10 <sup>-7</sup>		p-trend = 0.03		p-trend = 1.0		p-trend = 0.03		p-trend = 8.4x10 <sup>-5</sup>	
<b>FVC (mL) – excluding HRT ever users and ever smokers</b>										
Natural menopause at <45 years	613	-48 (-92, -3)	200	-79 (-144, -13)	224	2 (-59, 62)	214	-6 (-67, 56)	303	-11 (-64, 42)
Natural menopause at 45-47 years	1132	-22 (-55, 11)	422	-26 (-73, 20)	346	-17 (-67, 33)	311	24 (-27, 76)	412	-12 (-58, 35)
Natural menopause at 48-53 years	5537	Ref.	3710	Ref.	2770	Ref.	1891	Ref.	2059	Ref.
Natural menopause at 54-55 years	433	31 (-18, 80)	1326	-11 (-40, 18)	918	-36 (-70, -3)	613	32 (-7, 71)	512	17 (-25, 60)
Natural menopause at 56+ years	-	-	590	-2 (-42, 38)	653	-18 (-56, 20)	465	42 (-2, 86)	434	29 (-17, 74)
	p-trend = 0.004		p-trend = 0.2		p-trend = 0.2		p-trend = 0.2		p-trend = 0.02	
<b>FVC (mL) – excluding HRT ever users, ever smokers, and extreme BMI</b>										
Natural menopause at <45 years	454	-47 (-98, 5)	149	-81 (-157, -5)	160	14 (-57, 85)	147	12 (-61, 85)	210	-14 (-78, 51)
Natural menopause at 45-47 years	885	-25 (-63, 12)	326	-37 (-89, 16)	275	-17 (-72, 39)	236	-9 (-68, 50)	324	-9 (-62, 45)
Natural menopause at 48-53 years	4380	Ref.	2953	Ref.	2153	Ref.	1482	Ref.	1608	Ref.
Natural menopause at 54-55 years	341	33 (-23, 88)	1055	-3 (-35, 29)	705	-29 (-67, 8)	474	40 (-4, 85)	386	6 (-44, 56)
Natural menopause at 56+ years	-	-	446	19 (-27, 65)	473	-10 (-54, 34)	325	23 (-29, 75)	326	22 (-32, 75)
	p-trend = 0.007		p-trend = 0.07		p-trend = 0.4		p-trend = 0.4		p-trend = 0.1	

Model 3: Adjusted for centre, age, ethnicity, standing height, Townsend deprivation index, age at menarche, oral contraceptive use, hormone replacement therapy use, number of live births, smoking status, pack-years, and body mass index. Reference group: Women with natural menopause at age 48-53. *P*-trend is from model with age at menopause as continuous variable.

**Supplementary table S6.** Association of forced expiratory volume in 1 second (FEV1) with age at natural menopause, by age group.

	40-55 years		56-59 years		60-62 years		63-65 years		66-70 years	
	N	Difference (95% CI)	N	Difference (95% CI)	N	Difference (95% CI)	N	Difference (95% CI)	N	Difference (95% CI)
<b>FEV1 (mL/s)</b>										
Natural menopause at <45 years	1976	-41 (-63, -19)	1041	-44 (-69, -19)	1053	-36 (-60, -11)	1010	-24 (-49, 1)	1000	-30 (-55, -5)
Natural menopause at 45-47 years	2324	-26 (-45, -7)	1282	-11 (-34, 12)	1297	-3 (-25, 19)	1105	-13 (-37, 11)	1284	-15 (-38, 8)
Natural menopause at 48-53 years	9788	Ref.	8174	Ref.	7309	Ref.	5779	Ref.	5743	Ref.
Natural menopause at 54-55 years	703	-2 (-33, 30)	2612	6 (-11, 23)	2351	-13 (-31, 4)	1831	2 (-18, 21)	1498	-2 (-23, 20)
Natural menopause at 56+ years	-	-	1147	-4 (-29, 20)	1710	-3 (-23, 17)	1393	19 (-3, 40)	1296	6 (-17, 28)
	p-trend = 1.1x10 <sup>-5</sup>		p-trend = 0.002		p-trend = 0.05		p-trend = 6.2x10 <sup>-4</sup>		p-trend = 6.9x10 <sup>-4</sup>	
<b>FEV1 (mL/s) – excluding HRT ever users</b>										
Natural menopause at <45 years	992	-54 (-84, -25)	332	-57 (-100, -14)	361	-38 (-78, 3)	373	-26 (-66, 14)	508	-49 (-85, -14)
Natural menopause at 45-47 years	1656	-24 (-47, -2)	638	-19 (-51, 12)	558	-17 (-51, 16)	474	-13 (-49, 23)	623	-10 (-43, 22)
Natural menopause at 48-53 years	7773	Ref.	5189	Ref.	3881	Ref.	2745	Ref.	2859	Ref.
Natural menopause at 54-55 years	573	17 (-18, 53)	1765	3 (-17, 24)	1223	-20 (-44, 4)	845	8 (-20, 37)	696	25 (-6, 56)
Natural menopause at 56+ years	-	-	791	-2 (-31, 27)	877	-3 (-30, 25)	621	36 (3, 68)	561	21 (-13, 55)
	p-trend = 6.6x10 <sup>-6</sup>		p-trend = 0.01		p-trend = 0.3		p-trend = 0.005		p-trend = 1.5x10 <sup>-5</sup>	
<b>FEV1 (mL/s) – excluding HRT ever users and ever smokers</b>										
Natural menopause at <45 years	613	-38 (-75, -1)	200	-73 (-128, -18)	224	-2 (-52, 48)	214	-9 (-60, 42)	303	-10 (-54, 35)
Natural menopause at 45-47 years	1132	-18 (-45, 9)	422	-1 (-39, 38)	346	-21 (-62, 20)	311	15 (-28, 59)	412	-7 (-46, 32)
Natural menopause at 48-53 years	5537	Ref.	3710	Ref.	2770	Ref.	1891	Ref.	2059	Ref.
Natural menopause at 54-55 years	433	11 (-30, 51)	1326	-7 (-32, 17)	918	-27 (-54, 1)	613	20 (-13, 53)	512	18 (-18, 54)
Natural menopause at 56+ years	-	-	590	-1 (-35, 32)	653	-12 (-43, 20)	465	39 (2, 76)	434	28 (-10, 67)
	p-trend = 0.008		p-trend = 0.2		p-trend = 0.6		p-trend = 0.1		p-trend = 0.02	
<b>FEV1 (mL/s) – excluding HRT ever users, ever smokers, and extreme BMI</b>										
Natural menopause at <45 years	454	-37 (-80, 6)	149	-72 (-134, -9)	160	8 (-51, 68)	147	0 (-61, 61)	210	-6 (-60, 48)
Natural menopause at 45-47 years	885	-20 (-51, 11)	326	-13 (-57, 30)	275	-19 (-65, 27)	236	-8 (-57, 41)	324	-4 (-49, 40)
Natural menopause at 48-53 years	4380	Ref.	2953	Ref.	2153	Ref.	1482	Ref.	1608	Ref.
Natural menopause at 54-55 years	341	11 (-35, 57)	1055	-1 (-28, 26)	705	-21 (-52, 11)	474	30 (-7, 67)	386	7 (-35, 48)
Natural menopause at 56+ years	-	-	446	10 (-28, 48)	473	-4 (-41, 33)	325	18 (-25, 62)	326	23 (-21, 68)
	p-trend = 0.02		p-trend = 0.1		p-trend = 0.8		p-trend = 0.3		p-trend = 0.1	

Model 3: Adjusted for centre, age, ethnicity, standing height, Townsend deprivation index, age at menarche, oral contraceptive use, hormone replacement therapy use, number of live births, smoking status, pack-years, and body mass index. Reference group: Women with natural menopause at age 48-53. P-trend is from model with age at menopause as continuous variable.

**Supplementary table S7.** Association of spirometric restriction (FVC<LLN) with age at natural menopause, by age group.

	40-55 years		56-59 years		60-62 years		63-65 years		66-70 years	
	N	OR (95% CI)	N	OR (95% CI)	N	OR (95% CI)	N	OR (95% CI)	N	OR (95% CI)
<b>FVC &lt; LLN</b>										
Natural menopause at <45 years	1976	1.05 (0.90-1.23)	1041	1.40 (1.18-1.66)	1053	1.21 (1.02-1.44)	1010	1.15 (0.95-1.38)	1000	1.19 (0.99-1.43)
Natural menopause at 45-47 years	2324	1.12 (0.98-1.28)	1282	1.06 (0.89-1.25)	1297	1.02 (0.86-1.20)	1105	1.06 (0.88-1.27)	1284	1.08 (0.91-1.28)
Natural menopause at 48-53 years	9788	Ref.	8174	Ref.	7309	Ref.	5779	Ref.	5743	Ref.
Natural menopause at 54-55 years	703	0.92 (0.73-1.17)	2612	0.92 (0.81-1.05)	2351	1.12 (0.98-1.27)	1831	0.99 (0.84-1.15)	1498	1.05 (0.90-1.24)
Natural menopause at 56+ years	-	-	1147	1.03 (0.86-1.24)	1710	1.13 (0.97-1.31)	1393	0.95 (0.80-1.13)	1296	0.95 (0.79-1.13)
	p-trend = 0.1		p-trend = 5.4x10 <sup>-4</sup>		p-trend = 0.8		p-trend = 0.05		p-trend = 0.02	
<b>FVC &lt; LLN – excluding HRT ever users</b>										
Natural menopause at <45 years	992	1.07 (0.87-1.32)	332	1.48 (1.11-1.98)	361	1.34 (1.00-1.80)	373	1.06 (0.79-1.44)	508	1.30 (1.02-1.67)
Natural menopause at 45-47 years	1656	1.09 (0.93-1.28)	638	1.03 (0.81-1.30)	558	1.34 (1.04-1.71)	474	0.92 (0.69-1.23)	623	1.12 (0.88-1.42)
Natural menopause at 48-53 years	7773	Ref.	5189	Ref.	3881	Ref.	2745	Ref.	2859	Ref.
Natural menopause at 54-55 years	573	0.80 (0.61-1.05)	1765	0.94 (0.80-1.11)	1223	1.26 (1.05-1.52)	845	0.91 (0.72-1.14)	696	0.89 (0.70-1.13)
Natural menopause at 56+ years	-	-	791	1.03 (0.83-1.28)	877	1.09 (0.88-1.36)	621	0.84 (0.64-1.10)	561	0.78 (0.60-1.03)
	p-trend = 0.05		p-trend = 0.08		p-trend = 0.5		p-trend = 0.3		p-trend = 5.8x10 <sup>-4</sup>	
<b>FVC &lt; LLN – excluding HRT ever users and ever smokers</b>										
Natural menopause at <45 years	613	0.86 (0.65-1.13)	200	1.65 (1.14-2.38)	224	1.18 (0.80-1.74)	214	0.91 (0.58-1.41)	303	1.07 (0.75-1.52)
Natural menopause at 45-47 years	1132	1.03 (0.84-1.25)	422	0.98 (0.72-1.31)	346	1.07 (0.76-1.50)	311	0.81 (0.55-1.19)	412	1.17 (0.87-1.59)
Natural menopause at 48-53 years	5537	Ref.	3710	Ref.	2770	Ref.	1891	Ref.	2059	Ref.
Natural menopause at 54-55 years	433	0.80 (0.58-1.09)	1326	1.02 (0.85-1.23)	918	1.28 (1.02-1.59)	613	0.90 (0.68-1.20)	512	0.90 (0.67-1.21)
Natural menopause at 56+ years	-	-	590	1.03 (0.80-1.33)	653	1.07 (0.83-1.39)	465	0.74 (0.53-1.03)	434	0.71 (0.51-1.00)
	p-trend = 0.7		p-trend = 0.4		p-trend = 0.5		p-trend = 0.6		p-trend = 0.01	
<b>FVC &lt; LLN – excluding HRT ever users, ever smokers, and extreme BMI</b>										
Natural menopause at <45 years	454	0.97 (0.70-1.35)	149	1.62 (1.03-2.53)	160	1.26 (0.77-2.04)	147	0.70 (0.38-1.29)	210	1.13 (0.73-1.76)
Natural menopause at 45-47 years	885	1.01 (0.80-1.29)	326	1.10 (0.78-1.55)	275	1.06 (0.70-1.59)	236	0.96 (0.61-1.52)	324	1.18 (0.83-1.68)
Natural menopause at 48-53 years	4380	Ref.	2953	Ref.	2153	Ref.	1482	Ref.	1608	Ref.
Natural menopause at 54-55 years	341	0.72 (0.50-1.06)	1055	0.94 (0.75-1.18)	705	1.34 (1.02-1.74)	474	0.84 (0.59-1.19)	386	1.01 (0.71-1.43)
Natural menopause at 56+ years	-	-	446	0.90 (0.66-1.24)	473	1.17 (0.86-1.61)	325	0.78 (0.51-1.18)	326	0.71 (0.48-1.07)
	p-trend = 0.4		p-trend = 0.08		p-trend = 0.3		p-trend = 0.9		p-trend = 0.04	

Model 3: Adjusted for centre, age, ethnicity, standing height, Townsend deprivation index, age at menarche, oral contraceptive use, hormone replacement therapy use, number of live births, smoking status, pack-years, and body mass index. Reference group: Women with natural menopause at age 48-53. *P*-trend is from model with age at menopause as continuous variable.

**Supplementary table S8.** Association of airflow obstruction (FEV1/FVC<LLN) with age at natural menopause, by age group.

	40-55 years		56-59 years		60-62 years		63-65 years		66-70 years	
	N	OR (95% CI)	N	OR (95% CI)	N	OR (95% CI)	N	OR (95% CI)	N	OR (95% CI)
<b>FEV1/FVC &lt; LLN</b>										
Natural menopause at <45 years	1976	1.21 (1.00-1.47)	1041	1.25 (1.01-1.55)	1053	1.19 (0.96-1.48)	1010	1.14 (0.91-1.44)	1000	1.00 (0.80-1.26)
Natural menopause at 45-47 years	2324	1.12 (0.95-1.33)	1282	0.89 (0.71-1.10)	1297	1.05 (0.86-1.30)	1105	1.23 (0.99-1.52)	1284	0.99 (0.81-1.22)
Natural menopause at 48-53 years	9788	Ref.	8184	Ref.	7309	Ref.	5779	Ref.	5743	Ref.
Natural menopause at 54-55 years	703	1.04 (0.76-1.43)	2612	0.85 (0.71-1.01)	2351	1.05 (0.88-1.25)	1831	1.08 (0.89-1.32)	1498	0.94 (0.76-1.15)
Natural menopause at 56+ years	-	-	1147	1.02 (0.80-1.29)	1710	0.88 (0.71-1.09)	1393	0.99 (0.79-1.24)	1296	1.01 (0.8q-1.26)
	p-trend = 0.1		p-trend = 0.03		p-trend = 0.1		p-trend = 0.1		p-trend = 0.8	
<b>FEV1/FVC &lt; LLN – excluding HRT ever users</b>										
Natural menopause at <45 years	922	1.10 (0.84-1.44)	332	1.25 (0.86-1.81)	361	1.43 (1.00-2.05)	373	1.17 (0.79-1.71)	508	1.26 (0.92-1.71)
Natural menopause at 45-47 years	1656	1.16 (0.94-1.42)	638	0.85 (0.61-1.17)	558	1.09 (0.79-1.51)	474	1.39 (0.99-1.96)	623	1.12 (0.84-1.50)
Natural menopause at 48-53 years	7773	Ref.	5189	Ref.	3881	Ref.	2745	Ref.	2859	Ref.
Natural menopause at 54-55 years	573	1.00 (0.70-1.43)	1765	0.80 (0.64-1.01)	1223	1.09 (0.85-1.41)	845	1.13 (0.84-1.53)	696	0.93 (0.69-1.27)
Natural menopause at 56+ years	-	-	791	0.96 (0.71-1.31)	877	0.75 (0.54-1.05)	621	0.80 (0.54-1.18)	561	0.97 (0.69-1.35)
	p-trend = 0.5		p-trend = 0.09		p-trend = 0.07		p-trend = 0.03		p-trend = 0.08	
<b>FEV1/FVC &lt; LLN – excluding HRT ever users and ever smokers</b>										
Natural menopause at <45 years	613	1.09 (0.74-1.61)	200	1.48 (0.88-2.49)	224	1.10 (0.61-1.99)	214	0.98 (0.50-1.92)	303	0.92 (0.55-1.51)
Natural menopause at 45-47 years	1132	1.14 (0.86-1.50)	422	0.59 (0.34-1.00)	346	1.28 (0.80-2.03)	311	1.12 (0.67-1.90)	412	1.03 (0.69-1.54)
Natural menopause at 48-53 years	5537	Ref.	3710	Ref.	2770	Ref.	1891	Ref.	2059	Ref.
Natural menopause at 54-55 years	433	1.05 (0.68-1.64)	1326	0.89 (0.68-1.18)	918	1.05 (0.75-1.47)	613	1.10 (0.74-1.64)	512	0.87 (0.59-1.29)
Natural menopause at 56+ years	-	-	590	1.06 (0.74-1.53)	653	0.82 (0.54-1.25)	465	0.87 (0.54-1.42)	434	0.90 (0.59-1.37)
	p-trend = 0.8		p-trend = 0.4		p-trend = 0.4		p-trend = 0.8		p-trend = 0.6	
<b>FEV1/FVC &lt; LLN – excluding HRT ever users, ever smokers, and extreme BMI</b>										
Natural menopause at <45 years	454	1.12 (0.73-1.70)	149	1.50 (0.83-2.72)	160	0.88 (0.43-1.77)	147	1.29 (0.65-2.58)	210	0.79 (0.43-1.43)
Natural menopause at 45-47 years	885	1.04 (0.77-1.42)	326	0.65 (0.37-1.16)	275	1.30 (0.80-2.12)	236	1.24 (0.71-2.18)	324	0.99 (0.64-1.53)
Natural menopause at 48-53 years	4380	Ref.	2953	Ref.	2153	Ref.	1482	Ref.	1608	Ref.
Natural menopause at 54-55 years	341	1.08 (0.68-1.73)	1055	0.82 (0.60-1.13)	705	1.05 (0.73-1.51)	474	1.08 (0.69-1.67)	386	0.90 (0.59-1.37)
Natural menopause at 56+ years	-	-	446	1.17 (0.79-1.73)	473	0.86 (0.55-1.34)	325	0.94 (0.55-1.60)	326	0.80 (0.49-1.29)
	p-trend = 0.8		p-trend = 0.6		p-trend = 0.7		p-trend = 0.5		p-trend = 0.6	

Model 3: Adjusted for centre, age, ethnicity, standing height, Townsend deprivation index, age at menarche, oral contraceptive use, hormone replacement therapy use, number of live births, smoking status, pack-years, and body mass index. Reference group: Women with natural menopause at age 48-53. P-trend is from model with age at menopause as continuous variable.

**Supplementary table S9.** Association of lung function with age at hysterectomy, by age group, among women who have never taken HRT.

	40-55 years		56-59 years		60-62 years		63-65 years		66-70 years	
	N	Difference (95% CI)	N	Difference (95% CI)	N	Difference (95% CI)	N	Difference (95% CI)	N	Difference (95% CI)
<b>FVC (mL)</b>										
Hysterectomy at < 45 years	1424	8 (-25, 41)	421	-32 (-78, 14)	339	-44 (-94, 6)	303	-47 (-99, 5)	331	-19 (-70, 32)
Hysterectomy at 45-47 years	271	-46 (-104, 12)	119	-109 (-193, -25)	79	-26 (-126, 73)	82	-66 (-162, 30)	95	19 (-72, 111)
Natural menopause at 48-53 years	7773	Ref.	5189	Ref.	3881	Ref.	2745	Ref.	2859	Ref.
Hysterectomy at 48-53 years	173	-19 (-89, 52)	87	-8 (-106, 90)	90	-51 (-144, 43)	65	-11 (-118, 96)	75	12 (-90, 115)
Hysterectomy at 54-55 years	7	45 (-300, 391)	15	-9 (-243, 235)	9	83 (-210, 375)	5	91 (-290, 473)	6	99 (-258, 456)
Hysterectomy at 56+ years	-	-	7	-40 (-382, 303)	6	-276 (-634, 83)	11	-102 (-360, 156)	15	43 (-183, 269)
	p-trend = 1.0		p-trend = 0.5		p-trend = 1.0		p-trend = 0.2		p-trend = 0.2	
<b>FEV1 (mL/s)</b>										
Hysterectomy at < 45 years	1424	9 (-18, 37)	421	-33 (-71, 6)	339	-31 (-73, 10)	303	-39 (-83, 5)	331	-7 (-50, 36)
Hysterectomy at 45-47 years	271	-31 (-79, 18)	119	-81 (-151, -10)	79	2 (-82, 85)	82	-59 (-140, 23)	95	42 (-35, 119)
Natural menopause at 48-53 years	7773	Ref.	5189	Ref.	3881	Ref.	2745	Ref.	2859	Ref.
Hysterectomy at 48-53 years	173	-27 (-86, 33)	87	-10 (-92, 72)	90	-31 (-109, 48)	65	-8 (-99, 83)	75	40 (-47, 126)
Hysterectomy at 54-55 years	7	93 (-198, 383)	15	-7 (-202, 189)	9	64 (-181, 309)	5	80 (-245, 405)	6	85 (-216, 385)
Hysterectomy at 56+ years	-	-	7	-13 (-300, 274)	6	-153 (-453, 148)	11	-55 (-274, 165)	15	85 (-105, 276)
	p-trend = 0.7		p-trend = 0.5		p-trend = 0.8		p-trend = 0.2		p-trend = 0.1	
	<b>N</b>	<b>OR (95% CI)</b>	<b>N</b>	<b>OR (95% CI)</b>	<b>N</b>	<b>OR (95% CI)</b>	<b>N</b>	<b>OR (95% CI)</b>	<b>N</b>	<b>OR (95% CI)</b>
<b>FVC&lt;LLN</b>										
Hysterectomy at < 45 years	1424	0.90 (0.74-1.10)	421	1.04 (0.78-1.37)	339	1.54 (1.15-2.07)	303	1.21 (0.87-1.67)	331	1.12 (0.82-1.52)
Hysterectomy at 45-47 years	271	1.20 (0.86-1.67)	119	1.01 (0.61-1.67)	79	0.72 (0.35-1.48)	82	1.38 (0.77-2.47)	95	0.80 (0.43-1.50)
Natural menopause at 48-53 years	7773	Ref.	5189	Ref.	3881	Ref.	2745	Ref.	2859	Ref.
Hysterectomy at 48-53 years	173	1.16 (0.76-1.75)	87	0.63 (0.33-1.23)	90	0.82 (0.42-1.60)	65	1.26 (0.62-2.53)	75	0.84 (0.42-1.65)
Hysterectomy at 54-55 years	7	0.95 (0.11-8.06)	15	0.94 (0.24-3.63)	9	0.96 (0.14-6.41)	5	1.00 (1.00-1.00)	6	1.40 (0.15-12.65)
Hysterectomy at 56+ years	-	-	7	0.91 (0.11-7.88)	6	3.18 (0.54-18.70)	11	2.28 (0.58-8.96)	15	1.00 (1.00-1.00)
	p-trend = 0.3		p-trend = 0.7		p-trend = 0.07		p-trend = 0.2		p-trend = 0.9	
<b>FEV1/FVC&lt;LLN</b>										
Hysterectomy at < 45 years	1424	0.98 (0.76-1.28)	421	1.34 (0.94-1.90)	339	1.01 (0.65-1.57)	303	1.09 (0.67-1.77)	331	0.93 (0.61-1.43)
Hysterectomy at 45-47 years	271	0.88 (0.53-1.45)	119	0.97 (0.47-2.00)	79	1.64 (0.76-3.57)	82	0.83 (0.32-2.17)	95	0.38 (0.13-1.10)
Natural menopause at 48-53 years	7773	Ref.	5189	Ref.	3881	Ref.	2745	Ref.	2859	Ref.
Hysterectomy at 48-53 years	173	1.47 (0.88-2.44)	87	1.66 (0.81-3.38)	90	0.87 (0.36-2.12)	65	0.92 (0.31-2.66)	75	0.63 (0.24-1.67)
Hysterectomy at 54-55 years	7	1.00 (1.00-1.00)	15	1.00 (1.00-1.00)	9	3.11 (0.37-26.11)	5	1.00 (1.00-1.00)	6	2.08 (0.22-19.86)
Hysterectomy at 56+ years	-	-	7	1.00 (1.00-1.00)	6	1.00 (1.00-1.00)	11	1.00 (1.00-1.00)	15	0.71 (0.09-5.64)
	p-trend = 0.1		p-trend = 0.6		p-trend = 0.7		p-trend = 0.2		p-trend = 0.2	

Model 3: Adjusted for centre, age, ethnicity, standing height, Townsend deprivation index, age at menarche, oral contraceptive use, HRT use, number of live births, smoking status, pack-years, and body mass index. Ref. group: Women with natural menopause at age 48-53. P-trend is from model with age at hysterectomy as continuous variable.

**Supplementary table S10.** Association of lung function with age at oophorectomy + hysterectomy, by age group, among women who have never taken HRT.

	40-55 years		56-59 years		60-62 years		63-65 years		66-70 years	
	N	Difference/OR (95% CI)	N	Difference/OR (95% CI)	N	Difference/OR (95% CI)	N	Difference/OR (95% CI)	N	Difference/OR (95% CI)
<b>FVC (mL)</b>										
Oophor.+hysterect. at < 45 years	82	-55 (-168, 58)	15	71 (-165, 307)	20	-54 (-250, 141)	36	-74 (-218, 70)	41	-179 (-317, -40)
Oophor.+hysterect. at 45-47 years	65	70 (-46, 185)	13	-91 (-345, 162)	9	-167 (-459, 124)	8	-87 (-391, 217)	18	-57 (-264, 150)
Natural menopause at 48-53 years	7773	Ref.	5189	Ref.	3881	Ref.	2745	Ref.	2859	Ref.
Oophor.+hysterect. at 48-53 years	247	-55 (-116, 7)	121	20 (-64, 104)	94	87 (-5, 178)	80	-77 (-175, 21)	151	-2 (-75, 72)
Oophor.+hysterect. at 54-55 years	2	-622 (-1267, 24)	7	-391 (-736, -47)	7	115 (-215, 445)	5	-54 (-439, 330)	7	272 (-59, 603)
Oophor.+hysterect. at 56+ years	-	-	14	140 (-104, 383)	22	-1 (-188, 188)	15	-160 (-383, 63)	32	-69 (-225, 87)
		p-trend = 0.5		p-trend = 0.5		p-trend = 0.9		p-trend = 1.0		p-trend = 0.2
<b>FEV1 (mL/s)</b>										
Oophor.+hysterect. at < 45 years	82	-16 (-111, 79)	15	17 (-181, 215)	20	-28 (-191, 136)	36	-62 (-185, 60)	41	-114 (-231, 3)
Oophor.+hysterect. at 45-47 years	65	91 (-6, 189)	13	-70 (-282, 142)	9	-101 (-345, 143)	8	-78 (-336, 179)	18	0 (-175, 174)
Natural menopause at 48-53 years	7773	Ref.	5189	Ref.	3881	Ref.	2745	Ref.	2859	Ref.
Oophor.+hysterect. at 48-53 years	247	-33 (-85, 19)	121	21 (-49, 92)	94	76 (-1, 152)	80	-60 (-143, 22)	151	24 (-38, 86)
Oophor.+hysterect. at 54-55 years	2	-463 (-1007, 81)	7	-271 (-559, 17)	7	79 (-197, 355)	5	-100 (-426, 225)	7	229 (-51, 508)
Oophor.+hysterect. at 56+ years	-	-	14	159 (-45, 363)	22	36 (-120, 192)	15	-109 (-298, 80)	32	-40 (-171, 92)
		p-trend = 0.3		p-trend = 0.7		p-trend = 0.7		p-trend = 0.7		p-trend = 0.5
	<b>N</b>	<b>OR (95% CI)</b>	<b>N</b>	<b>OR (95% CI)</b>	<b>N</b>	<b>OR (95% CI)</b>	<b>N</b>	<b>OR (95% CI)</b>	<b>N</b>	<b>OR (95% CI)</b>
<b>FVC&lt;LLN</b>										
Oophor.+hysterect. at < 45 years	82	1.91 (1.05-3.49)	15	0.36 (0.05-2.84)	20	1.30 (0.40-4.15)	36	1.89 (0.87-4.09)	41	2.03 (0.98-4.21)
Oophor.+hysterect. at 45-47 years	65	0.59 (0.26-1.33)	13	1.41 (0.30-6.70)	9	3.01 (0.64-14.25)	8	1.19 (0.19-7.29)	18	1.28 (0.39-4.15)
Natural menopause at 48-53 years	7773	Ref.	5189	Ref.	3881	Ref.	2745	Ref.	2859	Ref.
Oophor.+hysterect. at 48-53 years	247	1.22 (0.87-1.72)	121	0.81 (0.47-1.37)	94	0.51 (0.25-1.03)	80	1.29 (0.70-2.37)	151	0.85 (0.53-1.36)
Oophor.+hysterect. at 54-55 years	2	9.57 (0.57-161.05)	7	8.24 (1.69-40.13)	7	1.17 (0.13-10.51)	5	2.70 (0.33-21.79)	7	0.53 (0.04-6.49)
Oophor.+hysterect. at 56+ years	-	-	14	0.86 (0.18-4.04)	22	1.64 (0.54-5.02)	15	1.47 (0.41-5.20)	32	0.71 (0.24-2.08)
		p-trend = 0.2		p-trend = 0.9		p-trend = 0.8		p-trend = 0.1		p-trend = 0.1
<b>FEV1/FVC&lt;LLN</b>										
Oophor.+hysterect. at < 45 years	82	1.92 (1.05-3.49)	15	0.36 (0.05-2.84)	20	1.30 (0.40-4.15)	36	1.89 (0.87-4.09)	41	2.03 (0.98-4.21)
Oophor.+hysterect. at 45-47 years	65	0.59 (0.26-1.33)	13	1.41 (0.30-6.70)	9	3.01 (0.64-14.25)	8	1.19 (0.19-7.29)	18	1.28 (0.39-4.15)
Natural menopause at 48-53 years	7773	Ref.	5189	Ref.	3881	Ref.	2745	Ref.	2859	Ref.
Oophor.+hysterect. at 48-53 years	247	1.22 (0.87-1.72)	121	0.81 (0.47-1.37)	94	0.51 (0.25-1.03)	80	1.29 (0.70-2.37)	151	0.85 (0.53-1.36)
Oophor.+hysterect. at 54-55 years	2	9.57 (0.57-161.05)	7	8.24 (1.69-40.13)	7	1.17 (0.13-10.51)	5	2.70 (0.33-21.79)	7	0.53 (0.04-6.49)
Oophor.+hysterect. at 56+ years	-	-	14	0.86 (0.18-4.04)	22	1.64 (0.54-5.02)	15	1.47 (0.41-5.20)	32	0.71 (0.24-2.08)
		p-trend = 0.2		p-trend = 0.8		p-trend = 0.8		p-trend = 0.1		p-trend = 0.1

Model 3: Adjusted for centre, age, ethnicity, standing height, Townsend deprivation index, age at menarche, oral contraceptive use, HRT use, number of live births, smoking status, pack-years, and body mass index. Ref. group: Women with natural menopause at age 48-53. P-trend is from model with age at hysterectomy as continuous variable.