

On-line repository

“Early life origins of chronic obstructive pulmonary disease”

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Legends to figures

On-line repository, figure 1. Meta-analysis of the association of adult FEV₁ with one or more childhood disadvantage factors by centre in (A) men and (B) women, adjusted for smoking status, age and height. Boxes shows adjusted difference in FEV₁ in reference to those with 0 childhood disadvantage factors, horizontal lines show 95%CI, diamond shows combined estimate for all centres with 95%CI. Analyses include 8201 measurements in men and 8631 measurements in women with complete data, as measured in ECRHS I and ECRHS II.

On-line repository, table 1. Adult FEV₁ and decline in FEV₁ per year of follow-up in men and women, according to all childhood factors registered in ECRHS I.

		FEV ₁ *				decline in FEV ₁ †			
		MEN		WOMEN		MEN		WOMEN	
		<i>number</i>	<i>Mean</i>	<i>number</i>	<i>Mean</i>	<i>number</i>	<i>Mean</i>	<i>number</i>	<i>Mean</i>
		‡	FEV ₁ (l)	‡	FEV ₁ (l)	‡	FEV ₁ (l)	‡	FEV ₁ (l)
Maternal asthma	No	9290	4.26	9516	3.15	2975	-32.6	3042	-24.7
	Yes	522	4.17	748	3.06	160	-30.4	234	-28.1
Paternal asthma	No	9064	4.26	9276	3.15	2910	-32.6	2957	-24.5
	Yes	553	4.09	649	3.01	173	-32.7	214	-26.9
Maternal atopy	No	7724	4.24	7712	3.13	2499	-32.1	2497	-24.3
	Yes	1619	4.31	2313	3.18	477	-32.9	703	-26.5
Paternal atopy	No	8074	4.24	7994	3.14	2589	-31.9	2563	-24.4
	Yes	1181	4.29	1633	3.16	378	-35.9	519	-26.3
Childhood asthma	No	9808	4.26	10196	3.14	3154	-32.3	3263	-24.9
	Yes	422	4.00	315	3.04	118	-35.4	89	-20.7
Severe respiratory infection <5 yrs	No	8713	4.26	8866	3.15	2778	-32.3	2815	-24.8
	Yes	916	4.17	1098	3.07	289	-34.7	352	-25.2
Maternal smoking	No	7657	4.25	7733	3.13	2495	-31.1	2484	-24.3
	Yes	2433	4.26	2703	3.16	733	-36.6	844	-26.5
Paternal smoking	No	3362	4.32	3556	3.19	1080	-32.9	1150	-23.7
	Yes	6531	4.22	6630	3.12	2090	-32.2	2108	-25.4
N° of siblings:	0	1109	4.28	1060	3.16	355	-33.7	325	-26.0
	1	3136	4.33	3216	3.19	988	-32.1	1025	-23.9
	2	2590	4.27	2671	3.18	846	-31.3	850	-25.9
	3	1565	4.20	1608	3.10	517	-33.1	517	-24.3
	4 or more	1844	4.12	1966	3.04	571	-33.5	638	-25.1
Order of birth:	0	4313	4.28	4204	3.14	1393	-33.4	1340	-25.7
	1	3047	4.25	3114	3.16	979	-31.7	980	-24.7
	2	1477	4.27	1716	3.14	472	-32.3	555	-23.5
	3 or more	1396	4.15	1468	3.09	430	-31.5	473	-25.3
Day care:	No	5181	4.21	5637	3.10	1747	-34.3	1910	-27.9
	Yes	4824	4.30	4744	3.19	1445	-30.3	1406	-20.7
Pet at EC1:	No pet	3834	4.29	3779	3.16	1264	-32.7	1249	-25.7
	Cat	1734	4.24	1923	3.14	594	-33.5	647	-26.7
	Dog	1853	4.23	1776	3.14	558	-32.1	513	-22.5
	Cat&Dog	2817	4.21	3050	3.12	863	-31.6	953	-23.9
Season of birth:	Spring	2671	4.25	2785	3.13	862	-32.0	915	-25.2
	Summer	2488	4.26	2642	3.14	788	-32.2	827	-24.7
	Autumn	2457	4.24	2421	3.14	790	-31.8	779	-23.6
	Winter	2653	4.26	2707	3.15	844	-33.7	842	-26.0

* Level of forced expiratory volume in one second as measured in ECRHS I and ECRHS II

† Decline in forced expiratory volume in one second in ml per year of follow-up (FEV₁ in ECRHS II minus FEV₁ in ECRHS I).

‡ Sums (yes+no) differ due to a different number with missing information for each variable. Numbers refer to numbers of measurements for FEV₁ and number of individuals with two measurements for FEV₁ decline.

On-line repository, table 2. Characteristics of study population according to number of childhood disadvantage factors*.

		All	Number of childhood disadvantage factors			
			0	1	2	≥3
<i>N</i> †		13,359	8,000	4,224	979	156
			(60%)	(32%)	(7.4%)	(1.2%)
Adult smoking status						
Never	(%)	43.4	44.0	42.4	42.8	42.3
Ex	(%)	23.8	23.9	24.0	22.9	23.3
Current <10	(%)	12.6	12.9	12.5	11.3	10.7
Current 10-20	(%)	9.7	9.4	10.3	10.3	8.4
Current >20	(%)	10.4	9.9	10.9	12.8	15.4
BMI (kg/m ²)	(median)	23.8	23.7	23.8	24.0	23.9
Height	(mean)	1.71	1.71	1.71	1.70	1.70
Age	(mean)	36.9	37.2	36.5	36.8	35.9
Age completed education						
>22 years	(%)	28.8	28.9	27.8	30.9	33.6
18-22 years	(%)	31.2	31.5	31.6	27.2	30.4
≤18 years	(%)	40.1	39.6	40.6	42.0	36.0
Social Class						
I-II Professionals	(%)	30.1	30.2	30.3	28.1	34.1
III Non-manual	(%)	18.2	18.1	18.2	19.2	17.5
III Manual	(%)	16.6	16.0	17.7	15.5	22.0
IV-V Unskilled	(%)	12.9	12.0	14.2	16.0	9.4
Unclassified	(%)	22.2	23.7	19.7	21.2	17.0
Current asthma	(%)	5.1	2.9	6.0	15.5	29.5
Current wheeze	(%)	13.1	10.1	16.0	23.1	33.8
Atopy	(%)	30.4	28.2	32.3	37.8	48.3

* Maternal asthma, paternal asthma, childhood asthma, respiratory infections, and maternal smoking constituted the childhood disadvantage factors.

† *N* includes number of persons with data on lung function and childhood factors. Using person-surveys gave almost identical results.

On-line repository, table 3. Full models for associations of adult FEV₁* with (A) individual childhood factors mutually adjusted for each other and (B) number of childhood disadvantage factors, when including adjustment for current adult asthma, wheeze and atopy. Analyses include 7435 measurements in men and 7655 measurements in women with complete data.

	MEN			WOMEN		
	Adjusted difference in FEV ₁ [†] (ml)	95% CI	p-val	Adjusted difference in FEV ₁ [†] (ml)	95% CI	p-val
A						
Baseline FEV ₁ (ml) ‡	4401.1			3214.8		
Maternal asthma	-47.9	(-111.7, 15.8)	0.141	-15.6	(-54.1, 22.9)	0.427
Paternal asthma	-79.9	(-140.1, -19.7)	0.009	-46.8	(-86.6, -7.0)	0.021
Childhood asthma	-180.5	(-257.6, -103.3)	<0.001	-80.4	(-141.5, -19.3)	0.010
Severe respiratory infection <5 years	-67.3	(-115.4, -19.1)	0.006	-28.0	(-60.4, 4.3)	0.089
Maternal smoking	-33.7	(-67.9, 0.4)	0.053	-28.4	(-52.2, -4.6)	0.019
B						
Baseline FEV ₁ (ml) ‡	4390.9			3222.6		
Number of childhood factors						
1	-43.9	(-73.5, -14.3)	0.004	-40.6	(-61.3, -19.9)	<0.001
2	-158.3	(-211.6, -105.0)	<0.001	-57.7	(-93.9, -21.6)	0.002
3 or more	-149.5	(-274.5, -24.5)	0.019	-137.5	(-226.2, -48.7)	0.002
<i>For comparison:</i>						
Adult smoking status						
Ex	9.3	(-22.4, 41.1)	0.564	31.5	(9.8, 53.2)	0.004
Current <10 cig/day	-32.4	(-69.8, 4.9)	0.089	-10.7	(-35.8, 14.3)	0.400
Current 10-20 cig/day	-64.6	(-103.0, -26.1)	<0.001	1.4	(-26.1, 28.8)	0.922
Current >20 cig/day	-103.6	(-142.8, -64.5)	<0.001	-75.5	(-107.4, -43.7)	<0.001
Age at completed education						
18-22 years	-17.3	(-45.8, 11.2)	0.233	-22.9	(-42.6, -3.1)	0.023
≤18 years	-65.7	(-97.9, -33.5)	<0.001	-49.5	(-71.9, -27.1)	<0.001
Social Class (I-II)						
III Non-manual	-37.2	(-85.3, 11.0)	0.130	-8.4	(-36.5, 19.6)	0.555
III Manual	-52.6	(-92.8, -12.3)	0.010	-29.1	(-68.4, 10.3)	0.148
IV-V Unskilled	-16.5	(-66.4, 33.4)	0.517	-9.2	(-43.2, 24.8)	0.596
Unclassified	-100.7	(-156.3, -45.1)	<0.001	-25.1	(-59.0, 8.7)	0.146
Current asthma	-208.1	(-267.0, -149.2)	<0.001	-114.6	(-150.5, -78.6)	<0.001
Current wheeze	-103.2	(-133.7, -72.7)	<0.001	-92.6	(-115.9, -69.3)	<0.001
Current atopy	-6.7	(-31.2, 17.8)	0.594	-15.8	(-34.5, 3.0)	0.101

* Forced expiratory volume in one second as measured in ECRHS I and ECRHS II.

† Difference in FEV₁ (A) between subjects with and subjects without childhood factor, when adjusting for other childhood factors in the table (B) between subjects with a specific number of childhood factors and subjects with zero childhood factors. Analysed using generalized estimating equations models allowing for

dependency between two lung function measurements of the same individual, and adjusting for smoking status, age at completed education, social class, current asthma, current wheeze, atopy, age, height and centre.

‡ Baseline FEV₁ in never-smoking, high education, professional, median age, median height subjects with none of the childhood disadvantage factors, and no current adult asthma, wheeze or atopy.

On-line repository, table 4a. Associations of adult FEV₁* with individual childhood disadvantage factors (**A**) and with number of childhood disadvantage factors (**B**); when excluding all subjects with childhood asthma and excluding childhood asthma from the childhood disadvantage factors. Analyses include 7906 measurements in men and 8395 measurements in women with complete data.

	MEN (N=7,906)			WOMEN (N= 8,395)		
	Adjusted difference in FEV ₁ [†] (ml)	95% CI	p-val	Adjusted difference in FEV ₁ [†] (ml)	95% CI	p-val
A						
Baseline FEV ₁ (ml) ‡	4385.7			3192.5		
Maternal asthma	-53.2	(-117.1,10.7)	0.103	-32.0	(-70.3,6.2)	0.101
Paternal asthma	-77.4	(-138.3,-16.4)	0.013	-50.1	(-89.8,-10.3)	0.014
Severe respiratory infection before 5 yrs	-68.3	(-117.2,-19.5)	0.006	-32.0	(-64.4,0.4)	0.053
Maternal smoking	-41.7	(-75.3,-8.1)	0.015	-32.3	(-55.5,-9.1)	0.006
B						
Baseline FEV ₁ (ml) ‡	4377.9			3200.2		
Number of childhood factors						
1	-44.7	(-73.9,-15.4)	0.003	-43.7	(-63.9,-23.5)	<0.001
2	-134.7	(-193.0,-76.3)	<0.001	-55.2	(-93.1,-17.4)	0.004
3	-141.3	(-335.0,52.4)	0.153	-201.0	(-329.0,-73.0)	0.002
<i>For comparison:</i>						
Adult smoking status						
Former	4.0	(-26.5,34.5)	0.798	28.5	(7.5,49.6)	0.008
Current <10 cig/day	-40.4	(-75.8,-5.1)	0.025	-5.8	(-29.8,18.2)	0.637
Current 10-20 cig/day	-74.8	(-111.3,-38.2)	<0.001	-17.3	(-43.6,9.0)	0.197
Current >20 cig/day	-105.0	(-142.0,-68.0)	<0.001	-77.6	(-107.6,-47.6)	<0.001

* Forced expiratory volume in one second.

† Difference in FEV₁ (**A**) between subjects with and subjects without childhood factor, when adjusting for other childhood factors in the table (**B**) between subjects with a specific number of childhood factors and subjects with zero childhood factors. Adjusted for smoking status, age at completed education, social class, age, height and centre.

‡ Baseline FEV₁ in never-smoking, high education, professional, median age, median height subjects with none of the childhood disadvantage factors.

§ Estimates for adult smoking are presented in order to enable comparison of estimates. The estimates are from model B, but are practically identical in model A.

On-line repository, table 4b. Associations of decline in adult FEV₁* with individual childhood disadvantage factors (**A**) and with number of childhood disadvantage factors (**B**) in 5498 persons with complete data, excluding all subjects with childhood asthma and excluding childhood asthma from the childhood disadvantage factors.

	adjusted difference in ΔFEV₁[†] (ml/year)	95% CI	p-val
A			
<i>Baseline ΔFEV₁ (ml/yr) ‡</i>	-22.9		
Maternal asthma	-0.4	(-3.7,2.8)	0.795
Paternal asthma	-2.0	(-5.2,1.2)	0.215
Severe respiratory infection < 5 yrs	-1.5	(-4.1,1.0)	0.235
Maternal smoking	-1.2	(-3.0,0.7)	0.219
B			
<i>Baseline ΔFEV₁ (ml/yr) ‡</i>	-23.3		
Number of childhood factors			
1	-1.7	(-3.3,-0.1)	0.037
2	-2.7	(-5.8,0.4)	0.089
3 or more	-5.9	(-16.0,4.1)	0.249
<i>p for trend</i>	<i>0.016</i>		
<i>For comparison:</i>			
Adult smoking status			
Former	3.4	(1.6,5.1)	<0.001
Current <10 cig/day	-1.2	(-4.2,1.8)	0.445
Current 10-20 cig/day	-4.2	(-7.1,-1.3)	0.004
Current >20 cig/day	-9.1	(-11.6,-6.6)	<0.001

* Decline in forced expiratory volume in one second in ml per year of follow-up (FEV₁ in ECRHS II minus FEV₁ in ECRHS I)

† Difference in decline in FEV₁ in ml per year of follow-up (**A**) between subjects with and subjects without childhood factor, when adjusting for other childhood factors in the table (**B**) between subjects with a specific number of childhood factors and subjects with zero childhood factors. Adjusted for FEV₁ at baseline, mid age, midage², height at ECRHS II, difference in BMI, mid BMI, smoking, age at completed education, social class and centre.

‡ Baseline decline in FEV₁ per year of follow-up in never-smoking, high education, professional, median age, median height, median BMI subjects with none of the childhood disadvantage factors.

§ Estimates for adult smoking are presented in order to enable comparisons of estimates. The estimates are from model B, but are practically identical for model A.

On-line repository, table 4c. Associations of COPD* with individual childhood disadvantage factors (A) and with number of childhood disadvantage factors (B) when excluding all subjects with childhood asthma and excluding childhood asthma from the childhood disadvantage factors. Analyses include 7905 measurements in men and 8395 measurements in women with complete data.

	MEN (N=7,905)			WOMEN (N=8,395)		
	OR [†]	95% CI	p-val	OR [†]	95% CI	p-val
(A)						
Maternal asthma	1.71	(0.72-4.04)	0.221	1.69	(0.77-3.73)	0.194
Paternal asthma	2.30	(1.15-4.61)	0.019	2.55	(1.29-5.03)	0.007
Severe respiratory infection < 5 yrs	1.52	(0.78-2.98)	0.221	0.53	(0.19-1.45)	0.216
Maternal smoking	1.35	(0.80-2.29)	0.264	1.64	(0.95-2.81)	0.075
(B)						
Number of childhood factors						
0 (ref.)	1			1		
1	1.40	(0.87-2.23)	0.164	1.61	(0.98-2.64)	0.060
2 or 3	2.54	(1.28-5.03)	0.007	2.27	(1.14-4.53)	0.020
<i>For comparison ‡:</i>						
Adult smoking status						
Former	2.77	(1.44-5.35)	0.002	1.18	(0.61-2.29)	0.631
Current <10 cig/day	3.31	(1.52-7.23)	0.003	1.03	(0.40-2.64)	0.952
Current 10-20 cig/day	3.03	(1.40-6.53)	0.005	2.41	(1.19-4.88)	0.015
Current >20 cig/day	4.42	(2.25-8.69)	<0.001	4.95	(2.71-9.05)	<0.001

* COPD defined as FEV₁/FVC ratio <0.70 and FEV₁<80% predicted, lung function measurements from ECRHS I and ECRHS II.

† Odds ratio (OR) for COPD (A) comparing subjects with and without each childhood factor, when adjusting for other childhood factors in the table (B) comparing subjects with a specific number of childhood factors with subjects with zero childhood factors. Adjusted for smoking status, age completed education, social class, age, height and centre.

‡ Estimates for adult smoking are presented in order to enable comparisons of estimates. The estimates are from model B, but are practically identical for model A.