

## SUPPLEMENTARY FILE

Title page

### **Association between lung function of school age children and short-term exposure to air pollution and pollen: the PARIS cohort**

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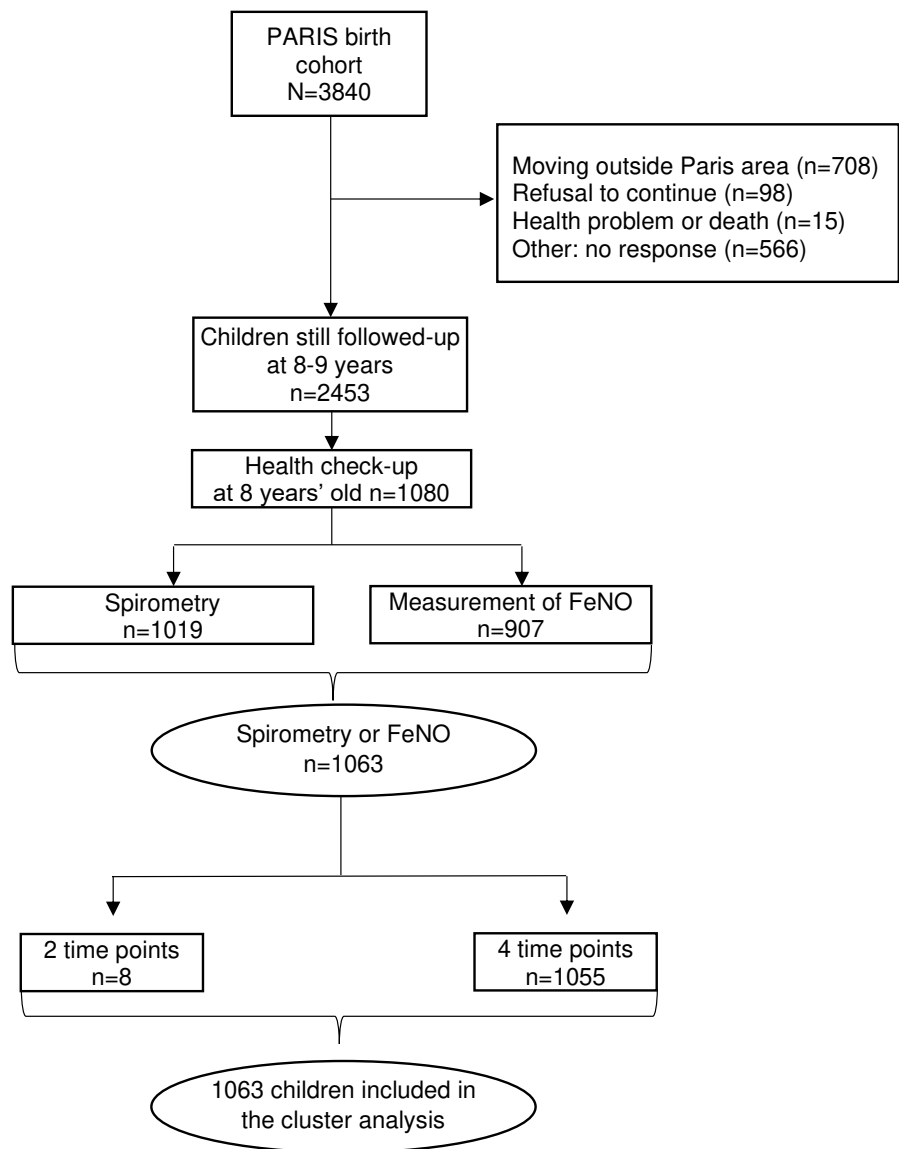
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**Figure S1.** Flow chart of the PARIS cohort children participating in the cluster analysis.

**Table S1.** Average daily exposure to air pollution and pollen in the 4 days before the health check-up at 8 years old in children from the PARIS cohort included in the cluster analysis (n=1063).

	Median	25 <sup>th</sup> percentile	75 <sup>th</sup> percentile
<b>ATMO air quality sub-index (1 [very good] to 10 [very poor])</b>			
<b>PM<sub>10</sub></b>	3	3	4
<b>NO<sub>2</sub></b>	3	2	3
<b>O<sub>3</sub></b>	3	2	4
<b>Pollen concentration (grains/m<sup>3</sup>)</b>			
<b>Alder</b>	0	0	0.6
<b>Ash</b>	0	0	0.8
<b>Birch</b>	0	0	0.8
<b>Cypress</b>	2.1	0	9.4
<b>Grasses</b>	0	0	2.9
<b>Hazel</b>	0	0	0
<b>Oak</b>	0	0	1
<b>Plane-tree</b>	0	0	0.2
<b>Poplar</b>	0	0	0.4
<b>Daily total concentration</b>	30.2	0	134.7

**Table S2.** Best Calinski-Harabasz criterion values for each number of clusters after 500 iterations.

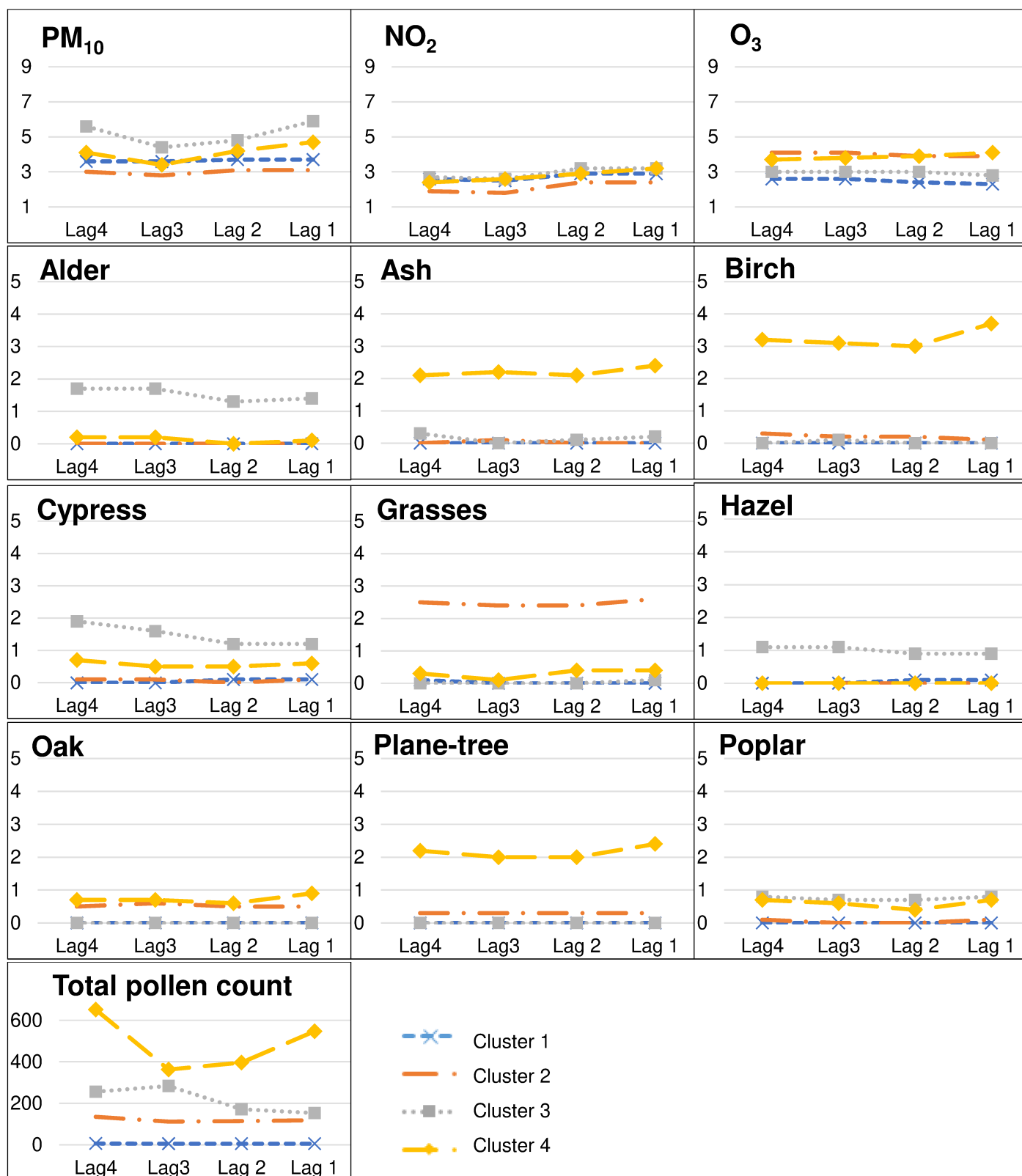
Number of clusters	Calinski-Harabasz criterion
2	279
3	260
4	267
5	246
6	236
7	217
8	205

	Cluster 1	Cluster 2	Cluster 3	Cluster 4
	550 (51.7%)	327 (30.8%)	104 (9.8%)	82 (7.7%)
<b>Exposure to air pollution (median of ATMO sub-indices)</b>				
PM <sub>10</sub>				
NO <sub>2</sub>				
O <sub>3</sub>				
<b>Exposure to pollen (median of allergenic risks)</b>				
Alder				
Ash				
Birch				
Cypress				
Grasses				
Hazel				
Oak				
Plane-tree				
Poplar				

**Legend:**

ATMO	1-2	3-4	5	6-7	8-9	10
sub-indices	"Very good"	"Good"	"Medium"	"Mediocre"	"Bad"	"Very bad"
Allergenic	0	1	2	3	4	5
risks	"Nil"	"Very low"	"Low"	"Moderate"	"High"	"Very high"

**Figure S2.** Average exposure to air pollution and pollen according to clusters identified in the four days preceding the health check-up at 8 years old in the PARIS birth cohort



**Figure S3.** Clusters of recent exposure both air pollution and pollen identified during the health check-up at 8 years old in the PARIS birth cohort with complete data for all clusters (n=1055).

**Legend:** The x-axis indicates the four time points corresponding to the four days (lag4, lag3, lag2, lag1) before preceding the health check-up and the y-axis is the mean value at each time point in each cluster. The variables were coded as follows: PM<sub>10</sub>, NO<sub>2</sub> and O<sub>3</sub> ATMO sub-indices from 1 (very good) to 10 (very bad), allergenic risk for each pollen species from 0 (nil) to 5 (very high), and total pollen concentration including 19 pollen species in grain/m<sup>3</sup>.

**Table S3.** Average of 4 days before for concentration of pollen count and for ATMO sub-indices of air pollution for children of the PARIS cohort with complete data for all clusters (n= 1055).

	Cluster 1			Cluster 2			Cluster 3			Cluster 4		
n (%)	542 (51.3)			327 (31)			104 (9.9)			82 (7.8)		
Percentile	median	25 <sup>th</sup>	75 <sup>th</sup>	median	25 <sup>th</sup>	75 <sup>th</sup>	median	25 <sup>th</sup>	75 <sup>th</sup>	median	25 <sup>th</sup>	75 <sup>th</sup>
<b>Exposure to air pollution</b> (expressed in ATMO sub index, 1 to 10)												
PM <sub>10</sub>	4	3	5	3	3	3	6	4	7	4	3	6
NO <sub>2</sub>	3	3	3	2	2	3	3	3	3	3	3	3
O <sub>3</sub>	3	2	3	4	3	5	3	3	3	4	4	4
<b>Exposure to pollen</b> (expressed in pollen grains/m <sup>3</sup> )												
Alder	0	0	0	0	0	0	23.4	16.8	41.1	1.6	0.8	2.5
Ash	0	0	0	0	0	1	1.6	0.4	2.8	33.9	26.7	126.6
Birch	0	0	0	0.2	0	1.6	0.2	0	1	174.5	36.1	269.1
Cypress	0	0	0	4.9	3.1	7.6	70.6	34.9	131.4	15.2	8.4	32.9
Grasses	0	0	0	19.9	6.8	38.6	0	0	0.2	0.8	0.4	1
Hazel	0	0	0	0	0	0	12.1	4.5	20.5	0	0	0.4
Oak	0	0	0	2.7	0	17.2	0	0	0	2.1	0.6	48.7
Plane-tree	0	0	0	0.2	0	3.7	0	0	0	153.9	1	252.3
Poplar	0	0	0	0	0	0.4	5.6	0.8	14.5	6.6	4.3	13.7
Daily total concentration	0	0	0	113.5	60.6	176.1	154.4	92.5	250.2	509.5	428.2	666.4