Supplementary

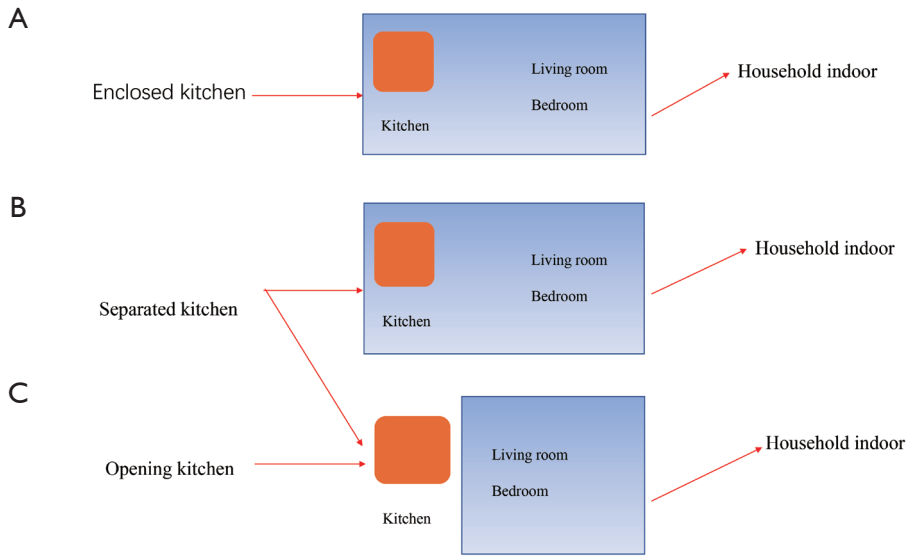

Figure S1 Description of various kitchen types. (A) Enclosed kitchen, represents inside or opening kitchen, which is defined as a kitchen that was not isolated to the living room or bedroom with a door or other device; (B) separated kitchen, represents the kitchen which is isolated to the living room or bedroom with a door or other device, and also represents the kitchen which is separate outside the house (i.e., the kitchen of kind of C); (C) outdoor kitchen, represents to the kitchen which is separate outside the house.

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Table S1 The adjusted β (95% confidence interval) of Period II versus Period I for the influencing factors on children's lung function according to generalized linear regression models, correlating all the confounders studied

Variables	FVC, mL	FEV_1, mL	PEF, mL/s	FEF25–75, mL/s
M0[1] + study period × district (ref: urban)	–54.6 (–149.2, 40.0)	–38.4 (–115.9, 39.0)	1,394.8 (946.0, 1,843.5)**	–45.5 (–198.3, 107.2)
M0 + study period× household coal use (ref: no)	–92.8 (–307.9, 122.4)	–20.6 (–196.9, 155.6)	268.5 (–777.3, 1,314.3)	402.9 (56.8, 749.1)**
M0 + study period × ventilation use when cooking (ref: no)	–12.3 (–547.7, 523.2)	–37.8 (–476.2, 400.7)	169.4 (–2,432.3, 2,771.0)	–139.9 (–1,003.9, 723.9)
M0 + study period × enclosed kitchen (ref: no)	33.4 (–39.3, 106.2)	47.3 (–41.4, 136.1)	–152.2 (–583.7, 279.4)	51.6 (–91.6, 194.9)
M0 + study period × father being white collar (ref: blue collar)	–8.7 (–105.5, 88.2)	–11.8 (–91.1, 67.6)	174.4 (–295.8, 644.6)	140.6 (–15.0, 296.3)
M0 + study period × father without stable income (ref: blue collar)	–122.1 (–277.8, 33.6)	–90.6 (–218.1, 36.9)	–563.9 (–1,319.7, 191.9)	–205.6 (–455.8, 44.6)
M0 + study period × mother being white collar (ref: blue collar)	82.6 (–18.3, 183.5)	45.5 (–37.3, 128.2)	–98.3 (–591.1, 394.4)	54.5 (–109.5, 218.5)
M0 + study period × mother without stable income (ref: blue collar)	–154.1 (–304.2, –3.87)*	–135.7 (–258.9, –12.6)*	–717.4 (–1,450.4, 15.7)	39.3 (–204.7, 283.3)
M0 + study period × paternal education (ref: < college)	46.7 (–74.7, 168.1)	50.9 (–48.5, 150.3)	–121.6 (–711.9, 468.7)	174.9 (–20.7, 370.6)
M0 + study period × maternal education (ref: < college)	148.5 (–10.0, 307.1)	83.2 (–46.8, 213.1)	–207.0 (–978.9, 564.9)	135.0 (–121.2, 391.2)
M0 + study period × breast feeding (ref: no)	58.9 (–45.2, 162.9)	71.1 (–14.1, 156.2)	540.1 (35.5, 1,044.7)**	149.8 (–17.9, 317.6)

[1], model 0: adjusted by age, sex, height, weight, district, father smoke, mother smoke, sleep in own room, sleep in own bed, household coal use, ventilation use when cooking, paternal occupation, maternal occupation, paternal education, maternal education, breast feeding, paternal asthma, and maternal asthma. *, P<0.05; **, P<0.01. FVC, forced vital capacity; FEV_1, forced expiratory volume in the first second; PEF, peak expiratory flow; FEF25–75, forced expiratory flow at 25% and 75% of the pulmonary volume.

Table S2 Lung function in children with different BMI status in Period II (2018)

Variables	Normal (N=283), mean (SD)	Overweight (N=53), mean (SD)	Obesity (N=47), mean (SD)	Overall (N=383), mean (SD)	P value
FVC, mL	1,740 (422)	1,990 (415)	2,190 (918)	1,830 (531)	0.001
FEV_1, mL	1,660 (374)	1,890 (387)	2,010 (657)	1,740 (439)	0.001
PEF, mL/s	3,250 (960)	3,760 (1,070)	3,890 (633)	2,410 (669)	0.001
FEF25–75, mL/s	2,350 (661)	2,580 (685)	2,630 (633)	2,410 (669)	0.0014

BMI, body mass index; SD, standard deviation; FVC, forced vital capacity; FEV_1, forced expiratory volume in the first second; PEF, peak expiratory flow; FEF25–75, forced expiratory flow at 25% and 75% of the pulmonary volume.

Table S3 Effects of different BMI on children's lung function in Period II. The effect estimates for continuous variables are changes in lung function indexes per unit change in the variable and those for categorical variables are differences from the reference group

BMI types	FVC, mL		FEV_1, mL		PEF, mL/s		FEF25–75, mL/s	
	β (95% CI)	P	β (95% CI)	P	β (95% CI)	P	β (95% CI)	P
Overweight (ref: normal)	201.1 (67.2, 334.9)	0.003	200.9 (83.1, 318.8)	0.001	304.5 (–19.7, 628.8)	0.066	111.9 (–104.4, 328.3)	0.311
Obesity (ref: normal)	286.1 (132.9, 439.3)	0.000	290.3 (155.4, 425.2)	0.000	819.5 (448.5, 1,190.5)	0.000	548.1 (300.5, 795.7)	0.000

CI, confidence interval.

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Table S4 The characteristics of determinant household conditions involved with fuel used in cooking/heating, ventilation use, etc., between urban and suburban areas after 25 years

Variables	Urban (n=491)	Rural (n=383)	P value
Household coal use, n (%)			0.0514
No	236 (96.7)	127 (91.4)	
Yes	4 (1.6)	7 (5.0)	
Missing	4 (1.6)	5 (3.6)	
Ventilation use when cooking, n (%)			0.5456
No	2 (0.8)	2 (1.4)	
Yes	223 (91.4)	122 (87.8)	
Missing	19 (7.8)	15 (10.8)	
Close/outside kitchen, n (%)			0.0087
No	65 (26.6)	54 (38.8)	
Yes	171 (70.1)	78 (56.1)	
Missing	8 (3.3)	7 (5.0)	

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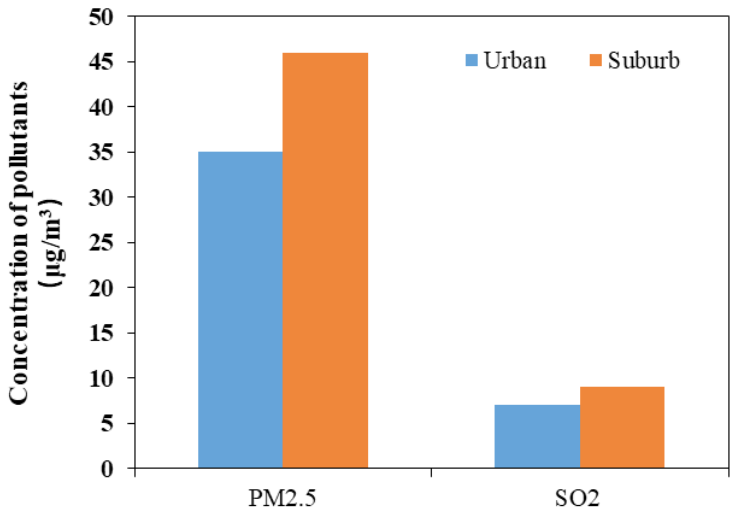

Figure S2 Concentrations of major atmospheric pollutants in urban and suburban areas in Wuhan in 2018 (data was obtained from the National monitoring station data released by the Ministry of Ecology and Environment).

Table S5 Adjusted association (β, 95% confidence interval) of household factors × breastfeeding in Period I for children's lung function according to multi linear regression models correlating all the confounders studied

Variables	FVC, mL	FEV_1, mL	PEF, mL/s	FEF25–75, mL/s
Urban × breastfeeding	–0.2 (–90.7, 90.4)	–36.5 (–112.7, 39.7)	498.9 (–145.4, 1143.2)	–114.8 (–269.2, 39.6)
Enclosed kitchen × breastfeeding	2.6 (–81.2, 86.5)	30.1 (–40.6, 100.6)	–238.3 (–836.1, 359.5)	–0.2 (–143.5, 143.1)
Household coal use × breastfeeding	44.6 (–37.8, 126.9)	40.4 (–28.9, 109.8)	–619.9 (–1205.6, –34.1)	74.9 (–65.9, 215.7)
Ventilation when cooking × breastfeeding	37.4 (–46.8, 121.5)	15.0 (–55.9, 85.9)	655.4 (57.4, 1253.4)*	–23.8 (–167.7, 120.2)

Adjusted by age, sex, weight, height, district, father smoke, mother smoke, sleep in own room, sleep in own bed, household coal use, ventilation use when cooking, paternal occupation, maternal occupation, paternal education level, maternal education level, breast feeding. *, P<0.05. FVC, forced vital capacity; FEV_1, forced expiratory volume in the first second; PEF, peak expiratory flow; FEF25–75, forced expiratory flow at 25% and 75% of the pulmonary volume.

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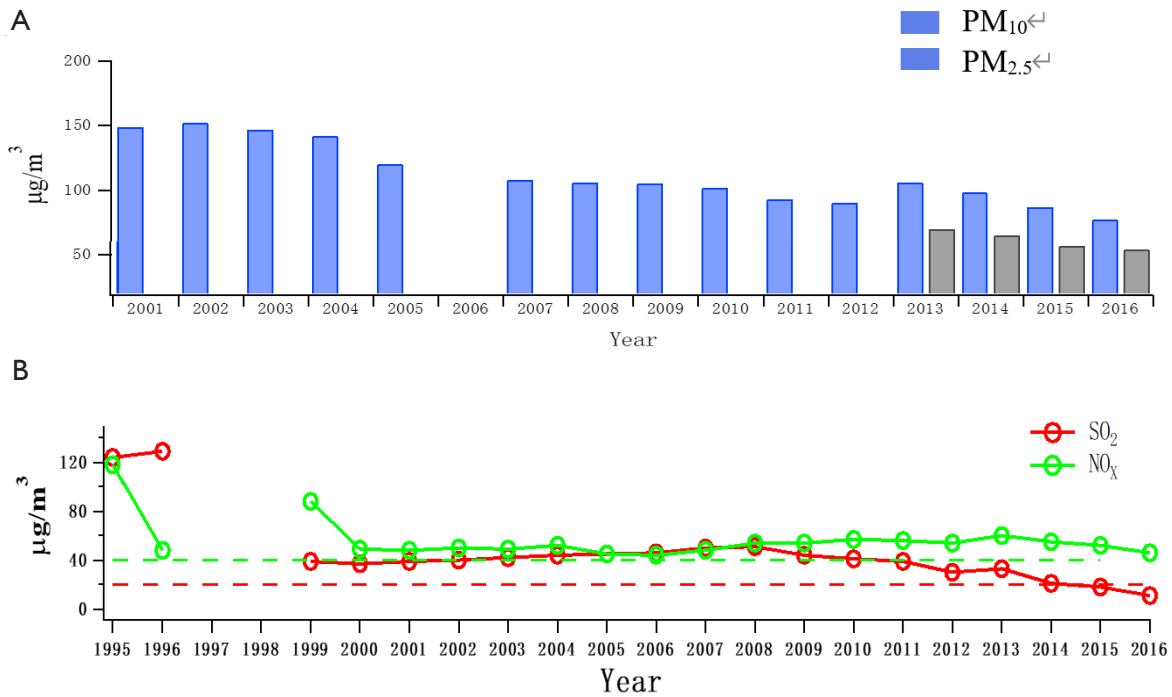

Figure S3 Annual means of fine particulate matter ($PM_{2.5}$) and particulate matter (PM_{10}) (A), and nitrogen dioxide (NO_2) and sulfur dioxide (SO_2) concentrations (B) for the period 1995–1996 and 2013–2016 (data was obtained from the National monitoring station data released by the Ministry of Ecology and Environment).

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