

Supplementary Table S1 Variables and definitions.

<i>Variables</i>	Definitions
<i>Primary Outcomes</i>	
Current wheeze	Parental report of ≥ 1 wheezing episode within the preceding 12-months
	Fulfillment of ≥ 1 criterion: 1) Physician-diagnosed asthma with respiratory symptoms in past year; 2) Asthma medication use (inhaled corticosteroids/ $\beta 2$ -agonists); 3) Concurrent symptoms and medication use without prior diagnosis recall.
<i>Secondary Outcomes</i>	
Incident respiratory diseases	New-onset events of diarrhea, influenza, pneumonia, common cold
Diarrhea	≥ 3 loose or watery stools per 24 hours
Influenza	Acute fever ($\geq 38^{\circ}\text{C}$) with cough/sore throat/myalgia + laboratory confirmation
Pneumonia	New infiltrate on chest radiograph + ≥ 2 of:
	- Fever $> 38.5^{\circ}\text{C}$
	- Tachypnea (RR: infant > 50 min; 1–5yr > 40 min)
	- Crackles on auscultation
	- Oxygen saturation $< 90\%$ (room air)
Common cold	Rhinorrhea/nasal congestion/sneezing + no or low-grade fever ($< 38^{\circ}\text{C}$) + absence of lower respiratory symptoms
Eczema	Diagnosed per UK Working Party criteria [ref] (pruritus + ≥ 3 minor criteria: history of flexural dermatitis, etc.)
Rhinitis	Defined per ARIA guidelines [ref] (symptoms ≥ 4 -days/week and > 4 -weeks)
Medication utilization	Patterns of bronchodilator/corticosteroid use, including Corticosteroids (ICS), Long-Acting $\beta 2$ -Agonists (LABA), Short-acting $\beta 2$ -agonists (SABA) and Leukotriene Receptor Antagonists (LTRA).
Environmental exposures	Documented exposure to tobacco smoke or pet dander
Household smoking	Cohabitation with ≥ 1 smoker consuming ≥ 1 cigarette/day with ≥ 1 hour/day exposure
Pet exposure	Continuous cohabitation with dogs/cats ≥ 3 -months

Covariates	
Hypertensive disorders of pregnancy	New-onset systolic BP ≥ 140 mmHg and/or diastolic BP ≥ 90 mmHg after 20-weeks' gestation (confirmed by ≥ 2 measurements ≥ 4 -hours apart), with/without proteinuria (≥ 300 mg/24h or ACR ≥ 30 mg/mmoL) or end-organ dysfunction
Gestational age	Determined by first-trimester fetal crown-rump length measurement at 11-13 ⁶ weeks
IVF conception	Conception through assisted reproductive technologies (conventional IVF or ICSI)
RDS	Respiratory distress with tachypnea >60 /min, grunting, retractions; plus, radiographic diffuse atelectasis; requiring surfactant/mechanical ventilation
Sepsis	Meeting ≥ 2 criteria: temperature instability, tachycardia >180 min, leukopenia $<5 \times 10^9$ /L or leukocytosis $>20 \times 10^9$ /L, CRP >10 mg/L, PCT >2 ng/mL; with/without culture confirmation per Chinese guidelines
EUGR	Birth weight $\geq 10^{\text{th}}$ percentile declining to $<10^{\text{th}}$ percentile for corrected gestational age at discharge
Household smoking	Cohabitation with ≥ 1 smoker consuming ≥ 1 cigarette/day with ≥ 1 hour/day exposure
Pet exposure	Continuous cohabitation with dogs/cats ≥ 3 -months

IVF, In Vitro Fertilization; ICSI, Intracytoplasmic Sperm Injection; RDS, Respiratory Distress Syndrome; EUGR, Extrauterine Growth Restriction

Supplementary Table S2 Subgroup analysis of Current Wheezing on RDS and Control groups.

Variables	Subgroups	Total N° / Total n (%)	RDS group N° / Total n. (%)	Control group N° / Total n (%)	OR (95% CI)	p-value	aOR (95% CI)*	p-value
Gestational age	< 28 weeks	9 / 87 (10.3)	9 / 74 (12.2)	0 / 13 (0) ^{&}	1.14 (1.05, 1.24)	0.344	–	–
	28 ⁺⁰ -29 ⁺⁶ weeks	21 / 270 (7.8)	15 / 131 (11.5)	6 / 139 (4.3)	2.87 (1.08, 7.63)	0.029	3.19 (1.13, 9.02)	0.028
	≥ 30 ⁺⁰ weeks	15 / 168 (8.9)	7 / 70 (10.0)	8 / 98 (8.2)	1.02 (0.93, 1.13)	0.681	1.19 (0.39, 3.70)	0.760
Birth weight	< 1000g	6 / 104 (5.8)	3 / 77 (3.9)	3 / 27 (11.1)	0.32 (0.06, 1.72)	0.366	0.43 (0.03, 6.82)	0.547
	1000–1499g	29 / 296 (9.8)	22 / 153 (14.4)	7 / 143 (4.9)	3.26 (1.35, 7.89)	0.006	3.95 (1.50, 10.40)	0.005
	≥ 1500g	10 / 125 (8.0)	6 / 45 (13.3)	4 / 80 (5.0)	2.92 (0.78, 10.97)	0.192	2.40 (0.53, 1.91)	0.258
Sex	Male	23 / 287 (8.0)	14 / 156 (9.0)	9 / 131 (6.9)	1.34 (0.56, 3.19)	0.513	1.37 (0.53, 3.59)	0.518
	Female	22 / 238 (9.2)	17 / 119 (14.3)	5 / 119 (4.2)	3.80 (1.35, 10.67)	0.007	5.70 (1.81, 18.03)	0.003
In vitro fertilization	Yes	15 / 113 (13.3)	11 / 76 (14.5)	4 / 37 (10.8)	1.39 (0.41, 4.72)	0.590	1.81 (0.47, 7.07)	0.391
	No	30 / 412 (7.3)	20 / 199 (10.1)	10 / 213 (4.7)	2.27 (1.03, 4.97)	0.037	2.69 (1.17, 6.17)	0.020
BPD	Yes	16 / 184 (8.7)	14 / 126 (11.1)	2 / 58 (3.4)	3.50 (0.77, 15.94)	0.087	6.06 (1.21, 30.44)	0.029
	No	29 / 341 (8.5)	17 / 149 (11.4)	12 / 192 (6.3)	1.93 (0.89, 4.18)	0.090	1.81 (0.79, 4.18)	0.162
Duration of oxygen therapy	< 14 days	18 / 269 (6.7)	11 / 102 (10.8)	7 / 167 (4.2)	2.76 (1.04, 7.38)	0.036	2.88 (1.16, 7.15)	0.023
	14–27 days	8 / 65 (12.3)	6 / 39 (15.4)	2 / 26 (7.7)	2.18 (0.41, 11.76)	0.355	0.80 (0.09, 7.17)	0.840
	≥ 28 days	19 / 191 (9.9)	14 / 134 (10.4)	5 / 57 (8.8)	1.21 (0.42, 3.54)	0.723	1.98 (0.59, 6.65)	0.270
Invasive mechanical ventilation	Yes	13 / 125 (10.4)	12 / 85 (14.1)	1 / 40 (2.5)	6.41 (0.80, 51.15)	0.047	8.97 (0.96, 84.31)	0.055
	No	32 / 400 (8.0)	19 / 190 (10.0)	13 / 210 (6.2)	1.68 (0.81, 3.50)	0.161	1.97 (0.87, 4.46)	0.103

RDS, Respiratory Distress Syndrome; OR, Odds Risk; CI, Confidence Interval; BPD, Bronchopulmonary Dysplasia.

[&] No wheezing events. The data represent only the survivors with follow-up records.

* Adjusted for in vitro fertilization, gestational hypertension, gestational age, RDS, BPD, sepsis, EUGR, household tobacco smoke exposure and pet exposure.

Supplementary Table S3 Propensity score matching results: RDS vs. control groups.

	Total, n (%) (n = 380)	RDS group, n (%) (n = 190)	Control group, n (%) (n = 190)	95% CI	p-value
Current age, years, median (IQR)	4.0 (3.0, 5.0)	4.0 (3.1, 5.0)	4.0 (3.0, 5.0)	–	0.840
Gestational age, weeks (IQR)	29.0 (29.0, 30.3)	29.2 (29.0,30.3)	29.0 (29.0, 30.3)	–	0.434
Birth weight, grams (IQR)	1320 (1150, 1490)	1305 (1150, 1490)	1320 (1150, 1513)	–	0.434
Male	204 (53.7)	104 (54.7)	100 (52.6)	1.09(0.73, 1.63)	0.681
Vaginal delivery	121 (31.8)	58 (30.5)	63 (33.2)	0.89(0.58, 1.36)	0.582
Singleton pregnancy	228 (60.0)	122 (64.2)	106 (55.8)	1.42(0.94, 2.15)	0.094
In vitro fertilization	72 (18.9)	40 (21.1)	32 (16.8)	1.32(0.78, 2.20)	0.295
Completed course of antenatal corticosteroids	206 (54.2)	106 (55.8)	100 (52.6)	1.14(0.76, 1.70)	0.537
Gestational hypertension	45 (11.8)	25 (13.2)	20 (10.5)	1.29(0.69, 2.41)	0.427
Intrahepatic cholestasis of pregnancy	24 (6.3)	11 (5.8)	13 (6.8)	0.84(0.37, 1.92)	0.673
Premature rupture of membranes	93 (24.5)	52 (27.4)	41 (21.6)	1.37(0.86, 2.19)	0.189
Maternal chorioamnionitis	30 (7.9)	16 (8.4)	14 (7.4)	1.16(0.55, 2.44)	0.704
Gestational diabetes mellitus	76 (20.0)	43 (22.6)	33 (17.4)	1.39(0.84, 2.31)	0.200

RDS, Respiratory Distress Syndrome; OR, Odds Risk; CI, Confidence Interval; IQR, Interquartile Range.