

Supplementary Table S1. Characteristics of the included studies

First Author, Year.	Location & study period	Study design	Study population & sample size	Sampling procedure	Exposure assessment	Outcome measurement	Main results of study	Control of Confounding	Subgroup Analysis
Green, 2015 [28 ]	California 1999 to 2009	Retrospective cohort study	All singleton live birth and stillbirth from the California Office of Vital Statistics. Live birth: 3,012,270. Stillbirth: 13,999.	All singleton births and fetal death occurring between 20 and 42 weeks of gestation with a reasonable combination of birth weights according to gestational age and with mother's residence within 20km of a PM <sub>2.5</sub> , ozone and SO <sub>2</sub> monitoring station and 5km for CO and NO <sub>2</sub> .	PM <sub>2.5</sub> , O <sub>3</sub> , SO <sub>2</sub> , CO and NO <sub>2</sub> . Maternal residential zip code within 20 km of the closest air monitoring station for PM <sub>2.5</sub> , O <sub>3</sub> and SO <sub>2</sub> and 5km for CO and NO <sub>2</sub> .	Gestational age cut off point was 20 to 42 completed weeks. Estimation method: last menstrual period. Type of stillbirth: not reported	<p><b>PM<sub>2.5</sub> (10 µg/m<sup>3</sup>) Entire pregnancy:</b> Adjusted OR: 1.06 (0.99-1.13).  <b>NO<sub>2</sub> (per 10 ppb): Entire pregnancy:</b> Adjusted OR: 1.08 (1.03-1.13).  <b>Ozone (per 10 ppb): Entire pregnancy:</b> Adjusted OR: 1.01 (0.99-1.04).  <b>CO (per 1 ppm): Entire pregnancy:</b> Adjusted OR: 1.04 (0.97-1.12).  <b>SO<sub>2</sub> (per 10 ppb): Entire pregnancy:</b> Adjusted OR: 1.02 (0.91-1.14).</p> <p>By restricting the maternal residence to 2.5 Km or less from monitoring stations for <b>NO<sub>2</sub></b>: 1.10 (1.01, 1.20). And 10 Km or less for <b>O<sub>3</sub></b>: 1.02 (0.99, 1.05) and <b>PM<sub>2.5</sub></b>:1.05 (0.98, 1.13).</p>	Maternal education, race/ethnicity, and age, season of last menstrual period, sex of the infant or fetus, mean daily apparent temperature, year of conception, and air basin of maternal residence.	<p><b>PM<sub>2.5</sub> (10 µg/m<sup>3</sup>) 1st trimester:</b> Adjusted OR: 1.00 (0.96-1.04)  <b>2nd trimester:</b> Adjusted OR: 1.02 (0.98-1.06)  <b>3rd trimester:</b> Adjusted OR: 1.01 (0.96-1.06)  <b>NO<sub>2</sub> (per 10 ppb): 1st trimester:</b> Adjusted OR: 1.02 (0.98-1.05)  <b>2nd trimester:</b> Adjusted OR: 1.02 (0.99-1.06)  <b>3rd trimester:</b> Adjusted OR : 1.03 (0.99-1.08).  <b>Ozone (per 10 ppb): 1st trimester:</b> Adjusted OR: 1.00(0.98-1.02)  <b>2nd trimester:</b> Adjusted OR: 1.01 (0.99-1.03)  <b>3rd trimester:</b> Adjusted OR: 1.03 (1.01-1.05).  <b>CO (per 1 ppm): 1st trimester:</b> Adjusted OR: 1.00 (0.96-1.05)  <b>2nd trimester:</b> Adjusted OR: 1.01 (0.96-1.07)  <b>3rd trimester:</b> Adjusted OR: 1.01 (0.95-1.07).  <b>SO<sub>2</sub> (per 10 ppb): 1st trimester:</b> Adjusted OR: 0.95</p>

									(0.87–1.04) <b>2nd trimester:</b> Adjusted OR: 1.00 (0.91–1.09) <b>3rd trimester:</b> Adjusted OR: 0.95 (0.85 –1.07)
DeFranco,2015 [27 ]	Ohio, US 2006 to 2010	Retrospe ctive cohort study	Study Population: 755,745 births Sample size: 351,036 births, stillbirths: 1,848	All singleton live births and stillbirths occurring at 20–42 weeks of gestation without known major congenital anomalies, and with mother’s residence within 10 km of a PM <sub>2.5</sub> monitoring station.	PM <sub>2.5</sub> Maternal residence within 10 km of the closest air monitoring station obtained	Gestational age cut off point was ≥20 and for estimation both LMP and ultrasound methods were used.	<b>PM<sub>2.5</sub></b> (High exposure level) <b>Whole pregnancy</b> (15.67 µg/m <sup>3</sup> ): Adjusted OR (95% CI): 1.21 (0.96, 1.53)  By restricting the maternal residence to 5 Km from monitoring stations: <b>Whole pregnancy</b> (15.67 µg/m <sup>3</sup> ): Adjusted OR (95% CI): 1.06 (0.80, 1.41)	maternal age, race, education level, quantity of prenatal care, cigarette smoking, season of conception	<b>PM<sub>2.5</sub></b> (High exposure level): <b>1<sup>st</sup> Trimester</b> (17.2 µg/m <sup>3</sup> ): AdjustedOR (95% CI): 0.77 (0.58, 1.02) <b>2<sup>nd</sup> Trimester</b> (16.26 µg/m <sup>3</sup> ): AdjustedOR (95% CI): 0.80 (0.62, 1.04) <b>3<sup>rd</sup> Trimester</b> (16.22 µg/m <sup>3</sup> ): AdjustedOR (95% CI): 1.42 (1.06, 1.91)  By restricting the maternal residence to 5 Km from monitoring stations: <b>1<sup>st</sup> Trimester</b> (17.2 µg/m <sup>3</sup> ): AdjustedOR (95% CI): 0.71 (0.52, 0.96) <b>2<sup>nd</sup> Trimester</b> (16.26 µg/m <sup>3</sup> ): AdjustedOR (95% CI): 0.78 (0.60, 1.02) <b>3<sup>rd</sup> Trimester</b> (16.22 µg/m <sup>3</sup> ): AdjustedOR (95% CI): 1.54 (1.08, 2.20)

Faiz,2013 [21]	New Jersey, US 1998 to 2004	Time-stratified case-crossover study	All fetal deaths of New Jersey fetal death certificates. N = 1719	All singleton fetal deaths to mothers residing within 10km from the closest monitoring station.	PM <sub>2.5</sub> , NO <sub>2</sub> , SO <sub>2</sub> & CO Maternal residence within 10 km of the closest air monitoring station Obtained.	Gestational age cut off point was 20 to 42 completed weeks but the estimation method was not reported. Type of stillbirth not reported	<p><b>Lag day 2:</b>  <b>PM<sub>2.5</sub></b> (10.0µg/m<sup>3</sup>;increase in mean concentration):  Unadjusted OR: 1.05 (95% CI: 0.93-1.18)  Adjusted OR: 1.07 (95% CI: 0.93-1.22)  <b>NO<sub>2</sub></b> (16.4ppb increase in mean concentration):  Unadjusted OR: 1.12 (95% CI: 0.99-1.28)  Adjusted OR: 1.11 (95% CI: 0.97-1.26)  <b>SO<sub>2</sub></b> (4.7ppb increase in mean concentration):  Unadjusted OR: 1.11 (95% CI: 1.02-1.21)  Adjusted OR: 1.11 (95% CI: 1.02-1.22)  <b>CO</b> (0.54ppm increase in mean concentration):  Unadjusted OR: 1.20 (95% CI: 1.06-1.36)  Adjusted OR: 1.20 (95% CI: 1.05-1.37)  <b>Lag day 1:</b>  <b>SO<sub>2</sub></b>( 4.7ppb increase in mean concentration):  OR:1.04 (95% CI: 0.95–1.13)  Risks were attenuated for other pollutants, data not shown.</p>	mean ambient temperature; different two-pollutant models	
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Faiz,2012 [23]	New Jersey, US 1998 to 2004	Retrospe ctive cohort study	Sample size: No. Of birth: 718974 Stillbirth: 3034	All singleton fetal deaths to mothers residing within 10km from the closest monitoring station.	PM <sub>2.5</sub> , NO <sub>2</sub> , SO <sub>2</sub> & CO Maternal residence within 10 km of the closest air monitoring station.	Gestational age cut off point was 20 to 42 completed weeks. LMP method applied. Type of stillbirth not reported	<p>PM<sub>2.5</sub> (4μg/m<sup>3</sup> increase in mean concentration): Unadjusted OR: 0.86 (0.72, 1.03 ) Adjusted OR: 1.07 (0.86, 1.33) NO<sub>2</sub> (10ppb increase in mean concentration): Unadjusted OR:1.22 (0.98, 1.52) Adjusted OR: 1.27 (1.04, 1.55) SO<sub>2</sub> (3ppb increase in mean concentration): Unadjusted OR: 1.29 (1.07, 1.57) Adjusted OR: 1.18 (0.97, 1.44) CO (0.4ppm increase in mean concentration): Unadjusted OR: 1.05 (0.92, 1.21) Adjusted OR: 1.13 (0.99, 1.29)</p> <p>By restricting the maternal residence to 5 Km from monitoring stations: <b>Relative odds:</b> CO: 1.17 (p&lt;0.01) NO<sub>2</sub>: 1.40 (p&gt;0.05)</p>	Maternal age, race/ ethnicity, educational level, prenatal care, smoking, neighborhood SES, calendar year and month of conception, mean temperature. Single- pollutant models only.	<p>PM<sub>2.5</sub> (4 μg/m<sup>3</sup> increase in mean concentration): <b>First trimester:</b> Unadjusted OR:1.01( 95% CI: 0.88,1.15); adjusted OR: 1.15 (95% CI: 0.96, 1.37) <b>Second trimester:</b> Unadjusted OR: 1.00 (95% CI: 0.94, 1.07); adjusted OR: 1.14 (95% CI: 0.96, 1.35). <b>Third trimester:</b> unadjusted OR: 1.07 (95% CI: 0.87, 1.31);adjusted OR: 1.08 (95% CI: 0.79, 1.48) NO<sub>2</sub>(10ppb increase in mean concentration): <b>First trimester:</b> Unadjusted:1.19 (95% CI: 1.07, 1.31); adjusted:1.16 (1.03, 1.31) <b>Second trimester:</b> Unadjusted: 1.08 (95% CI: 0.93, 1.27); adjusted OR: 1.13 (95% CI: 0.96, 1.32). <b>Third trimester:</b> unadjusted1.06 (95% CI: 0.85, 1.33);adjusted:1.05 (95% CI: 0.90, 1.23) SO<sub>2</sub> (3ppb increase in mean concentration): <b>First trimester:</b> Unadjusted OR:1.02(95% CI: 0.95,1.10); adjusted: 1.13(1.01,1.28)</p>
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									<p><b>Second trimester:</b> Unadjusted OR: 1.17 (95% CI: 1.02, 1.24); adjusted OR: 1.12 (95% CI: 0.93, 1.29).</p> <p><b>Third trimester:</b> unadjusted: 1.10 (95% CI: 0.98, 1.17);adjusted: 1.26 (95% CI: 1.03, 1.37)</p> <p><b>CO (0.4ppm increase in mean concentration):</b></p> <p><b>First trimester:</b> Unadjusted OR:0.99(95% CI: 0.89,1.10); adjusted: 1.14(95% CI: 0.98, 1.32)</p> <p><b>Second trimester :</b> Unadjusted OR: 1.07 (95% CI: 0.95, 1.20); adjusted OR: 1.14 (95% CI: 1.01, 1.28).</p> <p><b>Third trimester :</b> unadjusted: 1.09 (95% CI: 0.96, 1.23);adjusted: 1.14 (95% CI: 1.06, 1.24)</p> <p>By restricting the maternal residence to 5 Km from monitoring stations:</p> <p><b>Relative odds:</b> <b>CO:</b> First trimester: 1.27(p&lt;0.01); Second &amp; Third trimester: 1.25(p&lt;0.01)</p> <p><b>NO<sub>2</sub>:</b> First &amp; Second trimester: 1.26(p&lt;0.01); Third trimester: 1.14(p&lt;0.01)</p>
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Hwang, 2011 [24]	Taiwan 2001 to 2007	Case control study	1,510,064 singleton births from the Taiwanese Birth Registry. Cases: n = 9325 Control: n = 93250	All singleton stillbirths after 20 weeks of gestational age and randomly selected controls without any birth defects, without history of maternal smoking and excluding the births at townships without air monitoring data.	PM <sub>10</sub> , SO <sub>2</sub> , NO <sub>2</sub> , CO, O <sub>3</sub> .  Inverse distance weighting method with maternal residence having to be within 25km from three closest monitoring stations.	Gestational age cut-off point was >20 weeks and was estimated by ultrasound examination. Type of stillbirth was not reported.	Adjusted OR (95% CI) PM <sub>10</sub> (10μg/m <sup>3</sup> increase in average concentration): 0.98 (0.94–1.01) SO <sub>2</sub> (1ppb increase in average concentration):1.01 (0.99–1.03) NO <sub>2</sub> (10ppb increase in average concentration): 0.98 (0.92–1.04) CO (100ppb increase in average concentration): 1.00 (0.98–1.02) O <sub>3</sub> (10ppb increase in average concentration): 0.97 (0.91–1.04)	Infant sex, maternal age, gestational age, municipal level SES, season of conception and year of birth. Multi-pollutant models.	Adjusted OR: PM <sub>10</sub> (10μg/m <sup>3</sup> increase in average concentration): <b>First trimester:</b> 1.02(95% CI: 0.99– 1.04) <b>Second trimester :</b> 0.96(95% CI: 0.94– 0.99) <b>Third</b> <b>trimester:</b> 0.97(95% CI: 0.94–1.00) SO <sub>2</sub> (1ppb increase in average concentration): <b>First</b> <b>trimester:</b> 1.02(95% CI: 1.00–1.04) <b>Second</b> <b>trimester:</b> 1.00(95% CI: 0.98–1.02) <b>Third</b> <b>trimester:</b> 1.00(95% CI: 0.98–1.02) NO <sub>2</sub> (10ppb increase in average concentration): <b>First</b> <b>trimester:</b> 1.01(95% CI: 0.96–1.07) <b>Second</b> <b>trimester:</b> 0.96(0.92 –1.02) <b>Third</b> <b>trimester:</b> 0.98(95% CI: 0.92–1.04) CO(100ppb increase in average concentration): <b>First trimester:</b> 1.00(95% CI: 0.98– 1.02) <b>Second trimester:</b> 0.99(95% CI: 0.97– 1.01) <b>Third trimester:</b>
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									<p>1.01(95% CI: 0.99–1.03)</p> <p><b>O<sub>3</sub></b>(10ppb increase in average concentration):</p> <p><b>First trimester:</b> 1.01(95% CI: 0.96–1.06)</p> <p><b>Second trimester:</b> 0.96(95% CI: 0.91–1.01)</p> <p><b>Third trimester:</b> 0.98 (95% CI: 0.93–1.04)</p>
Pearce, 2010 [25]	Newcastle upon Tyne, UK 1961 to 1992	Retrospective cohort study	109080 births from PAMPER database. No. of Participant: 90,537 births Stillbirth: 812	Individual-level information from the UK Particulate Matter and Perinatal Events Research (PAMPER) births cohort database. Home births without gestational age estimation were excluded from this study.	Weekly black smoke levels were obtained from routine air monitoring data. A two-stage statistical modelling strategy- first, a temporal trend estimated using a dynamic linear model and secondly, the remaining spatio-temporal variation accounted for using temporal and/or spatial covariates was used.	Gestational age cut-off point: 28 or more completed weeks and was estimated by using LMP or by ultrasound examination	Black smoke equivalent to <b>PM<sub>4</sub></b> (per 10µg/m <sup>3</sup> increase in average weekly concentration): Unadjusted OR: 1.012 (95% CI: 0.995–1.003) Adjusted OR: 1.010 (95% CI: 0.991–1.028)	Parity, maternal age, sex and Townsend deprivation score. Single-pollutant models.	<p>Trimester1: <b>PM<sub>4</sub></b>(per 10µg/m<sup>3</sup>increase in average weekly concentration):Unadjusted OR: 1.001 (0.992–1.013) Adjusted OR: 1.001 (95% CI: 0.990–1.012)</p> <p>Trimester2: <b>PM<sub>4</sub></b>(per 10µg/m<sup>3</sup>increase in average weekly concentration): Unadjusted OR: 1.005 (95% CI: 0.994–1.016) Adjusted OR: 1.004 (0.993–1.015)</p> <p>Trimester3: <b>PM<sub>4</sub></b>(per 10µg/m<sup>3</sup>increase in average weekly concentration): Unadjusted OR: 1.005 (95% CI: 0.995–1.016) Adjusted OR: 1.004 (95% CI: 0.993–1.015)</p>

Kim, 2007 [26]	Seoul, South Korea May 1, 2001 to May 31, 2004	Prospective cohort study	No. of participants: 5660 No. of birth: 1514 No. of stillbirth: 67	By excluding the births outside of Seoul, multiple births, missing values for the mother's address and socio-demographic risk factors and follow up loss.	PM <sub>10</sub> Average exposure levels at each trimester, each month of pregnancy, and 6 weeks before delivery from the nearest monitoring station of maternal residence.	Gestational age cut-off point: 24, 35 weeks of pregnancy and was estimated by LMP or by ultrasound examination. Type of stillbirth was not reported.	OR for 10µg/m <sup>3</sup> increase in the average ambient PM <sub>10</sub> concentration. <b>First trimester:</b> Unadjusted estimate: 0.83 (95% CI: 0.76–0.90) Adjusted estimate: 0.95 (95% CI: 0.85–1.02) <b>Second trimester:</b> Unadjusted estimate: 0.99 (95% CI: 0.93–1.05) Adjusted estimate: 1.07 (95% CI: 0.98 – 1.17) <b>Third trimester:</b> Unadjusted estimate: 1.14 (95% CI: 1.10 – 1.18) Adjusted estimate: 1.08 (95% CI: 1.02–1.14)	infant sex, infant order, maternal age, and education level, paternal education level, season of birth, alcohol drinking, maternal body mass index (BMI), and maternal weight just before delivery. Single-pollutant models only.	

Vassilev, 2001 [32]	New Jersey, US 1990 and 1991	Cross-sectional study	All singleton fetal deaths of New Jersey fetal death certificate. N= 1591	All singleton fetal deaths after excluding chromosomal abnormalities, and missing census tract coding of maternal address at birth.	<b>POM (polycyclic organic matter).</b> By combining modeled average concentrations for each census tract and categorized exposures into low (0.040 - 0.268mg/m <sup>3</sup> ), medium (0.269 - 0.610mg/m <sup>3</sup> ) and high exposure (0.611 - 2.830mg/m <sup>3</sup> ) level.	Gestational age cut-off point was >20 weeks but the estimation method and type of stillbirth were not reported.	Low exposure (0.040 - 0.268mg/m <sup>3</sup> ) served as reference. <b>Medium POM exposure(0.269-0.610mg/m<sup>3</sup>)</b> Unadjusted OR: 1.22 (95% CI :1.07-1.39) Adjusted OR: 1.21 (95% CI :1.04-1.40) <b>High POM exposure:</b> (0.611-2.830mg/m <sup>3</sup> ): Unadjusted OR (): 1.82 (95% CI :1.61-2.06) Adjusted OR: 1.19 (95% CI :1.02-1.39)	Race of the mother, education of the mother, and per capita income for the census tract. Single-pollutant models only.	
Bobak, 1999 [30]	Czech Republic 1986-1988	Ecologic study	Total No. of birth: 223929 No. of stillbirth: 971	All stillbirths from routine birth registration by the Czech Statistical Office.	SPM, SO <sub>2</sub> , NO <sub>x</sub>  From air monitoring station data annual geometric means were used.	Gestational age cut-off point: ≥28 weeks and the estimation method, type of stillbirth were not reported.	per 50 µg/m <sup>3</sup> increase in air pollutants : <b>OR : for SPM</b> Unadjusted OR: 0.94(95% CI: 0.77-1.14) Adjusted OR: 0.96 (95% CI:0.77–1.18) <b>OR: for SO<sub>2</sub></b> Unadjusted OR: 1.07 (95% CI:0.91–1.26) Adjusted OR: 0.98 (95% CI:0.80–1.20) <b>OR: for NO<sub>x</sub></b> Unadjusted OR: 1.07 (95% CI:0.89–1.29) Adjusted OR: 1.10 (95% CI:0.86–1.39)	Change from 25th to 75th percentile of socioeconomic variables. (mean income, mean savings, mean number of people / car, proportions of births outside marriage, proportion of divorces to new marriages, legally induced abortions / 100 live births, and proportion of gypsies in the population). Multipollutant models.	

Pereira, 1998 [22]	Sao Paulo, Brazil 1991 to 1992	Time series analysis	intrauterine mortality from death certificate provided by municipal mortality information improvement program; (PROAIM)	Daily counts of intrauterine mortality for fetuses over 28 weeks of pregnancy age.	NO <sub>2</sub> , SO <sub>2</sub> , CO, O <sub>3</sub> , PM <sub>10</sub>  From monitoring stations daily concentrations were collected, averaged, and considered as indicative of the citywide status. A short time lag up to 5 days was used.	Gestational age cut-off point: >28 weeks but the estimation method was not reported. Type of stillbirth: Antepartum.	<b>Regression coefficients and standard errors:</b> <b>NO<sub>2</sub>(mg/m<sup>3</sup>):</b> separately: 0.0013** 0.0003 Simultaneously: 0.0012** 0.0004 <b>SO<sub>2</sub>(mg/m<sup>3</sup>):</b> separately: 0.0038*** 0.0020 Simultaneously: 0.0029 0.0031 <b>CO(ppm):</b> separately: 0.0223*** 0.0132 Simultaneously: 0.0076 0.0158 <b>PM<sub>10</sub>(mg/m<sup>3</sup>):</b> separately: 0.0008 0.0006 Simultaneously: - 0.0005 0.0010 <b>O<sub>3</sub>(mg/m<sup>3</sup>):</b> separately: 0.000 0.0004 Simultaneously: 0.0002 0.0004 **p<0.01; ***p<0.10	season and weather (independent variables included in the models are 23 indicator variables for month and year, 6 indicator variables for day of week, 2-day moving averages of temperature and humidity, and 3 indicator variables each for temperature and humidity.) Index for several pollutants fitted.	
Landgren, 1996 [33]	Sweden 1985–1990	Cross-sectional study	All births (38718) from Birth and death registry whose mothers were residents in any one of the 19 municipalities of Malmöhus county.	Five registers were linked using the identification numbers of the women and the date of birth of the infant.	SO <sub>2</sub> , CH , NO Each exposure was evaluated in either of two ways. First: municipalities were divided in to two groups: above and below the mean exposure value of all municipalities. Second: municipalities with the	Not reported	<b>With the pollutant level over the average level.</b> <b>Adjusted OR:</b> <b>SO<sub>2</sub></b> (average-8.0µg/g): 0.79 (95% CI: 0.60-1.03); <b>CH</b> (average-6.6µg/g): 0.79 (95% CI :0.60-1.03); <b>NO</b> (average-14.7µg/g): 0.82 (95% CI :0.64-1.05) <b>With the highest pollutant level.</b> <b>Adjusted OR:</b>	Year of birth, maternal age and parity. Single pollutant models only.	

					highest exposure level were compared with all other municipalities.		<b>SO<sub>2</sub></b> : 0.26 (0.04-1.59); <b>CH</b> : 0.26 (0.04-1.59); <b>NO</b> : 0.82 (0.56-1.21)		
Sakai, 1984 [31]	Japan 1973 to 1977	Ecologic study	No. of spontaneous fetal deaths: 3229 obtained from vital statistics.	Spontaneous fetal death rate was calculated from the statistics.	Study was conducted in the most industrialized areas in Japan so the exposure source might be Industry. From the air monitoring stations, annual mean concentrations of air pollutants were retrieved.	Not reported	Correlation coefficient between fetal death rates and annual mean concentrations of air pollutants (1975-1977): <b>SO<sub>2</sub></b> : 0.704 (p<0.05) <b>NO</b> : 0.075 <b>NO<sub>2</sub></b> : 0.797 (p<0.01)	no adjustment for confounder	
Dimitriev, 2000 [29]	Russia Period.	Cohort study	Not reported	Not reported	Monthly concentration of the pollutants. Suspended solids, SO <sub>2</sub> , CO, NO <sub>2</sub>	Not reported	Risk of stillbirth in good ecologic area: 6.63±0.99 per 1000 birth And in worse ecologic area: 11.03±1.29 per 1000birth.  RR: 1.650 (95%CI:1.136,2.397)	no adjustment for confounder	

Supplementary Table S2. Quality score of the studies included in the meta-analysis

First Author, Year	Study design	selection	comparability	Outcome ascertainment	Total star
Green, 2015	Retrospective Cohort study	3	2	3	8
Faiz,2012	Retrospective Cohort study	3	2	3	8
Kim, 2007	Prospective cohort	3	2	2	7
Hwang, 2011	Case control study	4	2	3	9

Supplementary Table S3: Test for publication bias

Air pollutants	Begg's test		Egger's test		
	z	P value	Bias coefficient	95% CI	p value
SO <sub>2</sub>	-1.57	0.117	.0885095	-.0663099, .2433288	0.087
1 <sup>st</sup> trimester	-1.57	0.117	.0841189	.0661284, .1021093	0.011
2 <sup>nd</sup> trimester	-0.52	0.602	.0738603	-.2361117, .3838324	0.203
3 <sup>rd</sup> trimester	-0.52	0.602	.1770045	-.3299074, .6839164	0.141
NO <sub>2</sub>	-0.52	0.602	.1350579	-.512617, .7827327	0.230
1st trimester	-0.52	0.602	.1082307	-.3510618, .5675233	0.205
2nd trimester	-0.52	0.602	.0870046	-.4483083, .6223174	0.287
3rd trimester	-0.52	0.602	.0339803	-.4246369, .4925976	0.519
CO	-0.52	0.602	.0729344	-.731186, .8770548	0.455
1st trimester	-0.52	0.602	.0703383	-.5877602, .7284367	0.404
2nd trimester	-0.52	0.602	.0842781	-1.161509, 1.330065	0.548
3rd trimester	-1.57	0.117	.0759743	-.8795652, 1.031514	0.497
PM <sub>10</sub>	-1.00	0.317	*	*	*
1st trimester	1.00	0.317	*	*	*
2nd trimester	-1.00	0.317	*	*	*
3rd trimester	-1.00	0.317	*	*	*
PM <sub>2.5</sub>	-1.00	0.317	*	*	*
1st trimester	-1.00	0.317	*	*	*
2nd trimester	-1.00	0.317	*	*	*
3rd trimester	-1.00	0.317	*	*	*
O <sub>3</sub>	1.00	0.317	*	*	*
1st trimester	-1.00	0.317	*	*	*
2nd trimester	1.00	0.317	*	*	*
3rd trimester	1.00	0.317	*	*	*

\*Egger's test didn't show any estimates due to small number of studies. (N=2)