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Table S1. Number of participants of 38 hospitals in 17 provinces, related to STAR Methods.

Province	Hospital	Number of participants
Inner Mongolia	Chifeng Obstetrics and Gynecology Hospital	1,535
Inner Mongolia	Inner Mongolia People's Hospital	1,079
Inner Mongolia	Maternal and Child Health Hospital of Inner Mongolia Autonomous Region	344
Liaoning	Women and Children's Hospital of Jinzhou	1,600
Liaoning	Panjin Liaoyou Baoshihua Hospital	287
Beijing	Beijing Obstetrics and Gynecology Hospital, Capital Medical University	26,782
Beijing	Tongzhou Maternal&Child Health Hospital of Beijing	3,950
Beijing	Beijing Changping Maternal and Child Care Hospital	2,332
Beijing	Beijing Fangshan Maternal and Child Care Hospital	1,411
Beijing	Beijing Daxing Maternal and Child Care Hospital	1,136
Beijing	Beijing Huairou Maternal and Child Care Hospital	107
Beijing	Beijing Tongzhou Hospital of Integrated Traditional Chinese and Western Medicine	23
Tianjin	Tianjin Central Hospital of Gynecology Hospital	1,258
Hebei	Shijiazhuang Obstetrics and Gynecology Hospital	1,706
Hebei	Hebei Provincial Gucheng City Hospital	665
Hebei	Qinghe People's Hospital	218
Shandong	Weifang Maternal and Child Health Hospital	5,486
Shandong	Shandong Provincial Hospital	5,042
Shandong	Maternal and Child Health Care of Zaozhuang	3,469
Shandong	Maternal and Child Health Care of Linyi	2,093
Shandong	Maternal and Child Health Hospital of Dongchangfu District, Liaocheng City	1,204
Shandong	Taian Maternal and Child Health Hospital	314
Shandong	Jinan Maternal and Child Health Hospital	194
Gansu	Gansu Provincial Maternity and Child-care Hospital	1,596
Shaanxi	Northwest Women and Children's Hospital	6,248
Henan	Henan Provincial Maternal and Child Health Care Hospital	5,431
Henan	Anyang Maternal and Child Health Care Hospital	3,654
Henan	Nanyang Center Hospital	113
Jiangsu	Subei People's Hospital of Yangzhou	630
Jiangsu	Lianyungang Maternal and Child Health Hospital	369
Sichuan	Chengdu Women and Children Central Hospital	1,987
Hunan	Hunan Provincial Maternal and Child Health Care Hospital	2,848
Hunan	Changsha Hospital for Maternal&Child Health Care	278
Jiangxi	Ganzhou Maternity and Child Health Hospital of Jiangxi Province	1,912
Guizhou	Maternal and Child Health Hospital of Guiyang	810
Yunnan	Kunming City Maternal and Child Health Hospital	5,547
Guangdong	Shenzhen Maternity&Child Healthcare Hospital	7,356
Hainan	Hainan General Hospital	4,049

Table S2. Previous studies of the associations of particulate matter exposure with blood pressure as well as hypertension prevalence, related to STAR Methods.

Authors, publication year	Study design	Country	Population	Main findings
Haralabidis et al. 2008 [1]	Cross-sectional study	Greece	140 subjects aged 45-70 years	Effects of noise exposure on elevated subsequent BP measurements
Ubiratan et al. 2005 [2]	Cross-sectional study	Brazil	48 healthy, non-smoking vehicular traffic controllers, aged 31-55 years	Adult and healthy workers directly exposed to automotive traffic-generated air pollution, increases in primary gaseous pollutants were associated with changes in blood pressure
Guo et al. 2020 [3]	Cohort study	China	140,072 adults (≥18 years of age) without hypertension	A high-PA and low $PM_{2.5}$ exposure were associated with a lower risk of hypertension, and the positive association between $PM_{2.5}$ and hypertension was not modified by PA
Peters et al. 2019[4]	Cross-sectional study	United States	35,416 adults aged 20-75 years	Sex differences in the control of hypertension, diabetes mellitus, and dyslipidemia persist
Abe et al. 1994 [5]	Cohort study	Japan	14 male habitual drinkers with essential hypertension	A single intake of alcohol has a depressor effect on BP that lasts for several hours after drinking, while repeated intakes for 7 days have both depressor and pressor effects according to the differences in time intervals after the last drink
Bijnens et al. 2017 [6]	Meta analysis	Australia	6,330 adults aged 23-74 years	A small significant reduction in systolic blood pressure (−1.05 mm Hg, 95% CI -2.08 to 0.02) and a smaller non-significant reduction in diastolic blood pressure
Jill et al. 2014 [7]	Cross-sectional study	Canada	280 women (mean age: 51.9 y)	Black carbon (BC) from combustion emissions is more strongly associated with blood pressure than PM mass, and that BC's health effects may be larger among women living near a highway and with greater exposure to motor vehicle emissions
Dvonch et al. 2009 [8]	Cross-sectional study	United States	347 adults (mean age: 46.2 y ± 13.7)	Young age (<55 years) and not taking BP medications to be significant predictors of increased BP effects, and short-term increases in exposure to ambient $PM_{2.5}$ are associated with acute increases in BP in adults, especially within communities with elevated levels of exposure
Hooven et al. 2011[9]	Cohort study	Holland	7,006 pregnant women mean age 30.5 (19.3–39.4)	Elevated PM_{10} exposure levels were associated with a steeper increase in systolic blood pressure throughout pregnancy (P<0.01), but not with diastolic blood pressure patterns. Elevated NO_2 exposure was associated with higher systolic blood pressure levels in the first, second, and third trimester (P<0.05)
Lin et al. 2017 [10]	Cross-sectional study	China	12,665 adults (≥50 years of age)	long-term exposure to ambient $PM_{2.5}$ might be an important risk factor of hypertension, and is responsible for significant hypertension burden in adults in China. A higher consumption of fruit may mitigate, while overweight and obesity could enhance this effect
Dong et al. 2013[11]	Cross-sectional study	China	28,830 adults 45.59 years (±13.31)	Long-term exposure to PM_{10}, SO_2, and O_3 was associated with increased arterial blood pressure and hypertension
Diaz et al. 2014[12]	Cohort study	United States	2,043 adults (≥66.1 years of age)	Healthy lifestyle factors, particularly physical activity and non-smoking, are associated with a lower risk for cardiovascular events and mortality among individuals with apparent treatment-resistant hypertension
Wu et al. 2020 [13]	Cross-sectional study	China	9,354 children, aged 5 to 17 years	Long-term exposure to PM_1 is associated with hypertension in children, and that PM_1 might be a leading contributor to the hypertensive effect of $PM_{2.5}$
Diaz et al. 2017 [14]	Cohort study	United States	1,311 adults (≥45.7 years of age)	Regular moderate-vigorous physical activity or sport/exercise-related physical activity may reduce the risk of developing hypertension in African Americans

Zhang et al. 2018 [15]	Cross-sectional study	United States	1,293 pregnant women mean age 28.5, and their children who between 3–9 years of age	Exposure to ambient $PM_{2.5}$ during the third trimester of pregnancy is associated with elevated BP in children, ages 3 to 9 years
Bo et al. 2019 [16]	Cohort study	China	134,978 adults (≥ 18 years of age)	$PM_{2.5}$ exposure is associated with a decreased incidence of hypertension
Carrie et al. 2019[17]	Cohort study	United States	50,005 participants mean age was 25.5 (SD 4.5) years	Exposure to criteria air pollutants in the second trimester appeared to increase risk of gestational hypertension but not preeclampsia
Su et al. 2020 [18]	Cohort study	China	8,776 pregnant women mean age were 30.2 ± 3.6	$PM_{2.5}$ exposure during the first trimester is associated with the development of HDP. The effect estimate is more obvious for nulliparous women than multiparous women
Zhang et al. 2021[19]	Cohort study	China	7,658 pregnant women in this study had a mean (SD) age of 28.3 (3.5) years	$PM_{2.5}$ exposure might play an important role in BP pattern during pregnancy and might increase the risk of HDP, especially among women with excessive gestational weight gain
Zhang et al. 2019[20]	Cross-sectional study	China	43,745 children and adolescents aged 7-18 years	Long-term exposure to ambient PM air pollution was associated with increased blood pressure and higher prevalence of hypertension in children and adolescents
Li et al. 2022(Li et al., 2022)	Cross-sectional study	China	37,610 of children and adolescents with age 7-18 years	Long-term exposure to $PM_{2.5}$ mass and specific $PM_{2.5}$ components, especially for black carbon, are significantly associated with elevated blood pressure and a higher hypertension prevalence in Chinese children and adolescents
Madhloum et al. 2019 [22]	Cross-sectional study	Belgium	427 term (gestational age > 36 weeks) births	Prenatal air pollution exposure, greenness, and industrial area at maternal residence may affect offspring BP from birth onwards
Li et al. 2022[23]	Cohort study	China	55,232 aged 30-55 years	The protective effects of dietary nitrate intake and green leafy vegetables consumption against hypertension risk, and also identified a statistically significant interaction between dietary nitrate intake and long-term $PM_{2.5}$ exposure
Pieters et al. 2015[24]	Cohort study	Belgium	130 children aged 6-12 years	Children attending school on days with higher UFP concentrations (diameter < 100 nm) had higher systolic blood pressure. The association was dependent on UFP size, and there was no association with the $PM_{2.5}$ mass concentration
McCracken et al. 2007 [25]	RCT	United States	55 women adults (≥ 38 years of age)	The between-group comparisons provide evidence, particularly for DBP, that the chimney stove reduces blood pressure, and the before-and-after comparisons are consistent with this evidence
Hoffmann et al. 2012[26]	Panel study	United States	70 subjects with T2DM aged 40-85 years	In subjects with T2DM, PM was associated with increased BP, and ozone was associated with decreased BP
Zhang et al. 2018[27]	Cross-sectional study	China	361,560 adults ≥18 years	Long-term exposure to $PM_{2.5}$ air pollution is associated with higher blood pressure and an increased risk of hypertension
Chen et al. 2015[28]	Cross-sectional study	China	27,752 adults ≥65 years	One-year exposures to PM_{10}, $PM_{2.5-10}$, $PM_{2.5}$ absorbance, and NO_x were associated with higher diastolic BP in elderly residents of Taipei
Zhang et al. 2016(Zhang et al., 2016)	Cohort study	China	74,880 participants with mean aged 61 years	Long-term exposure to particulate matter was associated with small increases in risk of incident hypertension, particularly among younger women and the obese
Chen et al. 2021[30]	Cross-sectional study	China	373 elderly mean age was 63.5 (5.8) years	Short-term exposures to $PM_{2.5}$ and O_3 were associated with significant changes in BP, blood glucose and lipids, and psychosocial stress may increase the susceptibility of the participants to the adverse cardiovascular effects of $PM_{2.5}$ and O_3.

Liao et al. 2021 [31]	Single-arm, non-randomized intervention study	United States	120 pregnant women, the mean age of pregnant women was 26.2 years (standard deviation 4.3)	The range of exposure contrasts falls on steep sections of estimated exposure-response curves for birthweight, blood pressure, and acute lower respiratory infections, implying potentially important health benefits when transitioning from solid fuels to liquefied petroleum gas (LPG)
Morita et al. 2019 [32]	Cross-sectional study	Japan	5,109 participants (aged 52.5 ± 10.3 years)	Frequency of forest walking is not associated with prevalence of hypertension
Yang, B.Y., et al. 2019 [33]	Cross-sectional study	China	24,845 adults with a mean age of 45.6 years	Beneficial associations between community greenness and blood pressure in Chinese adults, especially for women. Air pollution and body mass index only partly mediated the associations
Xiao X et al. 2020 [34]	Cross-sectional study	China	9,354 children from 62 schools with a mean age of 10.9 years	Greater greenness near schools had a beneficial effect on blood pressure, particularly in overweight or obese children
Luo, Y N et al. 2022 [35]	Cross-sectional study	China	61,229 Chinese citizens aged 6-18 years from 94 schools	Higher greenness around schools may lower blood pressure levels and prevalent hypertension among Chinese children and adolescents, particularly in older subjects, boys, and those living in urban districts
Warembourg et al. 2021 [36]	Cohort study	Spain	4,279 children aged 4-5 years	Low green space was associated with higher diastolic BP
Yang et al. 2017[37]	Cross-sectional study	China	24,845 adults aged 18-74 years	Long-term exposure to ambient air pollution was more strongly associated with prehypertension than with hypertension, especially among females and the elderly
Yang et al.2019 [38]	Cross-sectional study	China	24,845 adults aged 18-74 years	Both PM_1 and $PM_{2.5}$ exposures were associated with elevated blood pressure levels and hypertension prevalence in Chinese adults. In addition, most of the pro-hypertensive effects of $PM_{2.5}$ may come from PM_1
Wang et al.2020[39]	Cross-sectional study	China	1.2 million pregnancy planners aged 18-45 years	Long-term exposure to PM_1 as well as $PM_{2.5}$ was associated with increased SBP and DBP of Chinese young adults planning for pregnancy
Raphael et al.2020 [40]	Cross-sectional study	United States	137,809 adults aged 35-70 years	Chronic exposures to outdoor $PM_{2.5}$ was associated with increased BP and hypertension while there were small inverse associations with household air pollution (HAP)
Yang et al.2018[41]	Meta analysis	China	100 studies involving ≈ 0.7 million participants	A positive association between ambient air pollution and increased BP and hypertension. Geographical and socio-demographic factors may modify the pro-hypertensive effects of air pollutants
Guan et al.2020[42]	Clinical trial	China	479,842 adults	The associations between ambient $PM_{2.5}$ exposure and elevated BP levels. The magnitude of the estimated associations varied substantially by geographic location in China
Liu et al. 2017 [43]	Cross-sectional study	China	13,975 participants aged 35-100 years	Long-term exposure to $PM_{2.5}$ was associated with increased prevalence of hypertension and slightly higher systolic BP in China. The effects of $PM_{2.5}$ on hypertension prevalence were stronger among middle-aged, obese and urban participants
Kateryna et al. 2017[44]	Cohort study	German y	41,072 participants with mean aged 47-71 years	Long-term residential exposures to air pollution and noise are associated with increased incidence of self-reported hypertension
Sun et al. 2020[45]	Meta analysis	China	Ten articles	There is a significant link between exposure to $PM_{2.5}$ and hypertensive disorders in pregnancy. The first and the third trimester were more susceptible to $PM_{2.5}$ exposure
Yan et al. 2021[46]	Meta analysis	China	Fifteen articles 0.5 million participants	Ambient air pollution was associated with higher hypertension prevalence and elevated blood pressure in children and adolescents
Li et al.	Cohort study	China	39,259	Long-term exposure to ambient PM_1 increases the risk of

2019[47]			participants The mean age was 55.6 (SD:12.19) years	hypertension and is associated with elevations in blood pressure in rural Chinese adults, especially in male and those with unhealthy habits
Yuan et al. 2020[48]	Cohort study	China	3692 mother-newborn pairs maternal mean age was 28.9 (3.4) years,	Ambient $PM_{2.5}$ exposure exhibited adverse impacts on multiple outcomes including reduced birth weight, LBW and PTB in the late pregnancy
Lee et al. 2012 [49]	Cross-sectional study	United States	2,211 pregnant with mean age was 24.9 (SD) = 5.9 years	First trimester PM_{10} and O_3 air pollution exposures increase blood pressure in the later stages of pregnancy. These changes may play a role in mediating the relationships between air pollution and adverse birth outcomes
Song et al. 2020[50]	Cross-sectional study	United States	6,814 White, Black, Hispanic and Chinese participants aged 45–84 years	Racial disparities in blood pressure were reduced after accounting for $PM_{2.5}$ and ozone while increased after accounting for NO_X
Maria et al. 2020[51]	Cohort study	United States	537 mother-child maternal mean age was 27.7 ± 5.59 years, children mean age was 4.80±0.56	Second and third trimester $PM_{2.5}$ exposure may increase children's BP in early life
Mobasher et al. 2013[52]	Case-control study	United States	298 pregnant women with mean aged 27.35 years	Among non-obese women, first trimester exposure to $PM_{2.5}$ and carbon monoxide are associated with increased odds of Hypertensive Disorder of Pregnancy
Vanessa et al. 2019 [53]	Cross-sectional study	United States	16,637 pregnant with aged 30-34 years	Maternal exposure to wood smoke in Monroe County during winter is associated with an increased odds of HDP during late gestation
Savitz et al. 2015[54]	Cross-sectional study	United States	268,601 participates	No correlation ambient air pollution on hypertensive disorders of pregnancy
Xie et al. 2018[55]	Cross-sectional study	China	39,348,119 participants reproductive-age (20-49 years)	Long-term exposures to $PM_{2.5}$ above certain levels might increase population risk for hypertension and might be responsible for China's avoidable hypertension burden in reproductive-age adults
Hendriks et al. 2016[56]	Cross-sectional study	Netherlands	1,500 eligible households	Access to improved quality healthcare through an insurance program in rural Nigeria was associated with a significant longer-term reduction in systolic BP in subjects with moderate or severe hypertension

Abbreviations: BP, blood pressure; RCT, randomized control trial; $PM_{2.5}$, particle with aerodynamic diameter ≤2.5 um; PA, physical activity; CI, confidence interval; PM_{10}, particle with aerodynamic diameter ≤10 um; NO_2, nitrogen dioxide; SO_2, sulphur dioxide; O_3, ozone; PM_1, particle with aerodynamic diameter ≤1.0 um; HDP, hypertensive disorders of pregnancy; DBP, diastolic blood pressure; SBP, systolic blood pressure; UFP, ultrafine particles; T2DM, type-2 diabetes mellitus; $PM_{2.5-10}$ is calculated by subtracting $PM_{2.5}$ from PM_{10}; NO_x, nitrogen oxides; LBW, low birth weight; PTB, premature birth.

Table S3. Distributions and spearman correlations of PM_1 concentrations (μg/m^3), related to Descriptive statistics of panel PM_1.

Exposure	Summary Statistics					Spearman		
	Mean (SD)	Median	Min	Max	IQR	FT PM_1	ST PM_1	TT PM_1
FT PM_1	29.90 (9.35)	28.80	0.61	67.30	13.00	1.00	0.47	0.17
ST PM_1	29.40 (8.97)	28.50	1.21	66.50	12.50	0.47	1.00	0.50
TT PM_1	29.10 (9.40)	27.20	4.83	85.30	13.30	0.17	0.50	1.00

FT, first trimester; ST, second trimester; TT, third trimester; PM_1, particle with aerodynamic diameter ≤1um; SD, standard deviation; Min, Minimum; Max, Maximum; IQR, indicates interquartile range (calculated by subtracting the 25th percentile from the 75th percentile).

Table S4. Association between each 10 μg/m^3 greater first-trimester PM_1 concentration and first-trimester blood pressure by potential effect modifiers*, related to Figure 1.

Characteristics	Subgroups	Systolic blood pressure		Diastolic blood pressure	
		aβ (95%CI)	$p_{interaction}$	*aβ* (95%CI)	$p_{interaction}$
Maternal age, years			0.001		<0.001
	≤35	1.614 (1.446, 1.782)		1.029 (0.875, 1.184)	
	>35	2.276 (1.809, 2.743)		1.237 (0.787, 1.688)	
Maternal ethnicity			<0.001		0.435
	Han	1.659 (1.496, 1.822)		1.065 (0.914, 1.216)	
	Minority	2.573 (1.917, 3.230)		0.927 (0.322, 1.532)	
Maternal education, years			<0.001		<0.001
	≤12	1.284 (1.066, 1.502)		0.618 (0.416, 0.820)	
	13-16	2.017 (1.766, 2.269)		1.412 (1.179, 1.645)	
	≥17	2.677 (2.144, 3.211)		1.943 (1.437, 2.449)	
Household annual income, CNY			<0.001		<0.001
	< 100,000	1.274 (1.016, 1.531)		0.755 (0.519, 0.991)	
	100,000-400,000	1.843 (1.625, 2.061)		1.198 (0.995, 1.402)	
	> 400,000	2.680 (2.192, 3.167)		1.745 (1.278, 2.212)	
Pre pregnancy BMI, kg/m^2			1.000		1.000
	<25	1.803 (1.631, 1.976)		1.135 (0.977, 1.294)	
	≥25	1.324 (0.913, 1.735)		0.696 (0.304, 1.089)	
Conception season			<0.001		<0.001
	Spring & Winter	1.187 (1.003, 1.372)		0.621 (0.445, 0.797)	
	Summer & Autumn	4.100 (3.805, 4.395)		2.648 (2.382, 2.914)	

PM_1, particle with aerodynamic diameter ≤1.0 μm; BMI, body mass index; a*β* indicates adjusted estimate; CI, confidence interval; CNY, China Yuan.

*Adjusted model: adjusted for maternal age, pre-pregnancy body mass index, maternal ethnicity, maternal education, household annual income, conception season, and ambient temperature.

Table S5. Association between each 10 μg/m^3 greater first-trimester PM_1 concentration and second-trimester blood pressure by potential effect modifiers*, related to Figure 2.

Characteristics	Subgroups	Systolic blood pressure		Diastolic blood pressure	
		a*β* (95%CI)	$p_{interaction}$	a*β* (95%CI)	$p_{interaction}$
Maternal age, years			<0.001		<0.001
	≤35	0.437 (0.293, 0.581)		0.076 (-0.065, 0.217)	
	>35	0.626 (0.215, 1.036)		0.283 (-0.135, 0.701)	
Maternal ethnicity			0.613		0.289
	Han	0.448 (0.308, 0.588)		0.096 (-0.041, 0.234)	
	Minority	0.740 (0.142, 1.339)		0.298 (-0.301, 0.898)	
Maternal education, years			<0.001		<0.001
	≤12	0.312 (0.125, 0.499)		-0.110 (-0.295, 0.075)	
	13-16	0.576 (0.358, 0.795)		0.287 (0.074, 0.501)	
	≥17	0.757 (0.295, 1.220)		0.583 (0.118, 1.047)	
Household annual income, CNY			<0.001		<0.001
	< 100,000	0.494 (0.272, 0.716)		-0.016 (-0.234, 0.201)	
	100,000-400,000	0.468 (0.280, 0.656)		0.153 (-0.033, 0.338)	
	> 400,000	0.536 (0.106, 0.965)		0.538 (0.110, 0.967)	
Pre pregnancy BMI, kg/m^2			1.000		1.000
	<25	0.547 (0.400, 0.695)		0.158 (0.013, 0.303)	
	≥25	0.116 (-0.244, 0.476)		-0.097 (-0.451, 0.257)	
Conception season			1.000		<0.001
	Spring & Winter	0.244 (0.076, 0.412)		0.125 (-0.042, 0.293)	
	Summer & Autumn	0.601 (0.364, 0.838)		0.240 (0.009, 0.470)	

PM_1, particle with aerodynamic diameter ≤1.0 μm; BMI, body mass index; a*β* indicates adjusted estimate; CI, confidence interval; CNY, China Yuan.

*Adjusted model: adjusted for maternal age, pre-pregnancy body mass index, maternal ethnicity, maternal education, household annual income, conception season, and ambient temperature.

Table S6. Association between each 10 μg/m^3 greater first-trimester PM_1 concentration and third-trimester blood pressure by potential effect modifiers*, related to Figure 4.

Characteristics	Subgroups	Systolic blood pressure		Diastolic blood pressure	
		aβ (95%CI)	$p_{interaction}$	*aβ* (95%CI)	$p_{interaction}$
Maternal age, years			<0.001		<0.001
	≤35	0.067 (-0.077, 0.210)		-0.159 (-0.290, -0.027)	
	>35	0.384 (-0.020, 0.788)		0.043 (-0.343, 0.429)	
Maternal ethnicity			0.981		0.931
	Han	0.076 (-0.064, 0.215)		-0.144 (-0.272, -0.016)	
	Minority	0.520 (-0.069, 1.108)		0.008 (-0.544, 0.561)	
Maternal education, years			<0.001		<0.001
	≤12	-0.094 (-0.279, 0.092)		-0.403 (-0.574, -0.232)	
	13-16	0.296 (0.079, 0.514)		0.126 (-0.074, 0.326)	
	≥17	0.292 (-0.168, 0.752)		0.269 (-0.166, 0.703)	
Household annual income, CNY			<0.001		<0.001
	< 100,000	0.027 (-0.192, 0.246)		-0.420 (-0.620, -0.219)	
	100,000-400,000	0.142 (-0.045, 0.329)		0.007 (-0.166, 0.180)	
	> 400,000	0.332 (-0.102, 0.766)		0.311 (-0.094, 0.716)	
Pre pregnancy BMI, kg/m^2			1.000		1.000
	<25	0.157 (0.010, 0.304)		-0.075 (-0.210, 0.060)	
	≥25	-0.104 (-0.462, 0.254)		-0.382 (-0.712, -0.052)	
Conception season			<0.001		<0.001
	Spring&Winter	-0.540 (-0.706, -0.374)		-0.300 (-0.455, -0.146)	
	Summer&Autumn	0.097 (-0.141, 0.335)		-0.091 (-0.308, 0.126)	

PM_1, particle with aerodynamic diameter ≤1.0 μm; BMI, body mass index; a*β* indicates adjusted estimate; CI, confidence interval; CNY, China Yuan.

*Adjusted model: adjusted for maternal age, pre-pregnancy body mass index, maternal ethnicity, maternal education, household annual income, conception season, and ambient temperature.

Table S7. Association between each 10 μg/m³ greater first-trimester PM_1 concentration and hypertensive disorders of pregnancy by potential effect modifiers*, related to Figure 3.

Characteristics	Subgroups	PM_1	
		aOR (95% CI)	$p_{interaction}$
Maternal age, years			0.016
	≤35	1.115 (1.071, 1.161)	
	>35	1.103 (1.004, 1.211)	
Maternal ethnicity			0.784
	Han	1.116 (1.074, 1.159)	
	Minority	1.087 (0.930, 1.271)	
Maternal education, years			<0.001
	≤12	1.018 (0.968, 1.070)	
	13-16	1.198 (1.125, 1.274)	
	≥17	1.361 (1.207, 1.534)	
Household annual income, CNY			<0.001
	< 100,000	1.009 (0.952, 1.070)	
	100,000-400,000	1.175 (1.114, 1.239)	
	> 400,000	1.289 (1.155, 1.439)	
Pre pregnancy BMI, kg/m²			1.000
	<25	1.130 (1.084, 1.177)	
	≥25	1.066 (0.977, 1.163)	
Conception season			1.000
	Spring & Winter	0.982 (0.933, 1.033)	
	Summer & Autumn	1.287 (1.217, 1.362)	

PM_1, particle with aerodynamic diameter ≤1.0 μm; BMI, body mass index; aOR, adjusted odds ratio; CI, confidence interval; CNY, China Yuan.
*Adjusted model: adjusted for maternal age, pre-pregnancy body mass index, maternal ethnicity, maternal education, household annual income, conception season, and ambient temperature.

Table S8. Association of each 10 μg/m³ increase in first-trimester PM_1 with maternal blood pressure and hypertensive disorders of pregnancy in different groups, related to Sensitivity analyses.

Sensitivity group	Outcome	PM_1	
		aβ/OR (95% CI)	p value
Excluding Urban			
	First trimester SBP	1.700 (1.357, 2.042)	<0.001
	First trimester DBP	1.004 (0.680, 1.328)	<0.001
	Second trimester SBP	0.369 (0.059, 0.679)	0.020
	Second trimester DBP	0.149 (-0.159, 0.458)	0.343
	Third trimester SBP	-0.022 (-0.330, 0.286)	0.890
	Third trimester DBP	-0.207 (-0.492, 0.078)	0.155
	HDP (aOR)	1.103 (1.021, 1.191)	0.013
Excluding South			
	First trimester SBP	1.783 (1.601, 1.965)	<0.001
	First trimester DBP	1.106 (0.935, 1.276)	<0.001
	Second trimester SBP	0.635 (0.479, 0.792)	<0.001
	Second trimester DBP	0.193 (0.037, 0.349)	0.015
	Third trimester SBP	0.447 (0.290, 0.604)	<0.001
	Third trimester DBP	0.040 (-0.107, 0.187)	0.591
	HDP (aOR)	1.219 (1.166, 1.274)	<0.001
Excluding Decoration			
	First trimester SBP	1.685 (1.521, 1.849)	<0.001
	First trimester DBP	1.049 (0.897, 1.200)	<0.001
	Second trimester SBP	0.462 (0.321, 0.603)	<0.001
	Second trimester DBP	0.094 (-0.045, 0.233)	0.183
	Third trimester SBP	0.117 (-0.023, 0.257)	0.102

	Third trimester DBP	-0.149 (-0.279, -0.02)	0.023
	HDP (aOR)	1.108 (1.067, 1.152)	<0.001
Excluding ICAP			
	First trimester SBP	1.685 (1.516, 1.853)	<0.001
	First trimester DBP	1.048 (0.892, 1.204)	<0.001
	Second trimester SBP	0.442 (0.297, 0.587)	<0.001
	Second trimester DBP	0.086 (-0.056, 0.229)	0.234
	Third trimester SBP	0.131 (-0.013, 0.275)	0.074
	Third trimester DBP	-0.130 (-0.262, 0.002)	0.054
	HDP (aOR)	1.118 (1.075, 1.163)	<0.001
Excluding ICCEITH			
	First trimester SBP	1.717 (1.556, 1.878)	<0.001
	First trimester DBP	1.083 (0.933, 1.232)	<0.001
	Second trimester SBP	0.432 (0.293, 0.570)	<0.001
	Second trimester DBP	0.083 (-0.054, 0.219)	0.234
	Third trimester SBP	0.080 (-0.058, 0.218)	0.256
	Third trimester DBP	-0.143 (-0.27, -0.016)	0.028
	HDP (aOR)	1.118 (1.076, 1.161)	<0.001
Excluding keep animals			
	First trimester SBP	1.596 (1.429, 1.763)	<0.001
	First trimester DBP	0.985 (0.831, 1.140)	<0.001
	Second trimester SBP	0.404 (0.260, 0.547)	<0.001
	Second trimester DBP	0.017 (-0.124, 0.158)	0.814
	Third trimester SBP	0.080 (-0.062, 0.223)	0.269
	Third trimester DBP	-0.174 (-0.306, -0.043)	0.009
	HDP (aOR)	1.094 (1.052, 1.138)	<0.001
Excluding Multipara			
	First trimester SBP	1.790 (1.565, 2.016)	<0.001
	First trimester DBP	1.197 (0.988, 1.405)	<0.001
	Second trimester SBP	0.479 (0.286, 0.672)	<0.001
	Second trimester DBP	0.072 (-0.118, 0.262)	0.456
	Third trimester SBP	0.145 (-0.047, 0.338)	0.139
	Third trimester DBP	-0.049 (-0.226, 0.128)	0.587
	HDP (aOR)	1.140 (1.079, 1.204)	<0.001

Abbreviations: PM_1, particle with aerodynamic diameter ≤1.0 μm; SBP, systolic blood pressure; and DBP, diastolic blood pressure; HDP, hypertensive disorders of pregnancy; aβ indicates adjusted estimate; CI, confidence interval; aOR, adjusted odds ratio; ICAP, Indoor chemical air pollution; ICCEITH, indoor coal combustion emissions at home.

*****Adjusted model: adjusted for maternal age, maternal pre-pregnancy body mass index, maternal ethnicity, maternal education, household annual income, conception season, and ambient temperature.

Table S9. Associations of each 10 μg/m^3 increase in first-trimester PM_1 concentrations during pregnancy with maternal blood pressure and hypertensive disorders of pregnancy*, related to Sensitivity analyses.

	SBP		DBP		HDP	
	aβ (95% CI)	p value	aβ (95% CI)	p value	aOR (95% CI)	p value
					1.084 (1.043, 1.126)	<0.001
FT	1.341 (1.179, 1.502)	<0.001	0.799 (0.649, 0.948)	<0.001		
ST	0.347 (0.208, 0.486)	<0.001	0.014 (-0.123, 0.151)	0.839		
TT	0.100 (-0.038, 0.239)	0.156	-0.201 (-0.329, -0.073)	0.002		

FT, first-trimester; ST, second-trimester; TT, third-trimester; PM_1, particle with aerodynamic diameter ≤1.0 μm; aβ indicates adjusted estimate; CI, confidence interval; aOR, adjusted odds ratio; SBP, systolic blood pressure; and DBP, diastolic blood pressure; HDP, hypertensive disorders of pregnancy.

*Adjusted model: adjusted for maternal age, pre-pregnancy body mass index, maternal ethnicity, maternal education, household annual income, conception season, ambient temperature, ozone and $PM_{1\text{-}2.5}$ (calculated by subtracting PM_1 from $PM_{2.5}$).

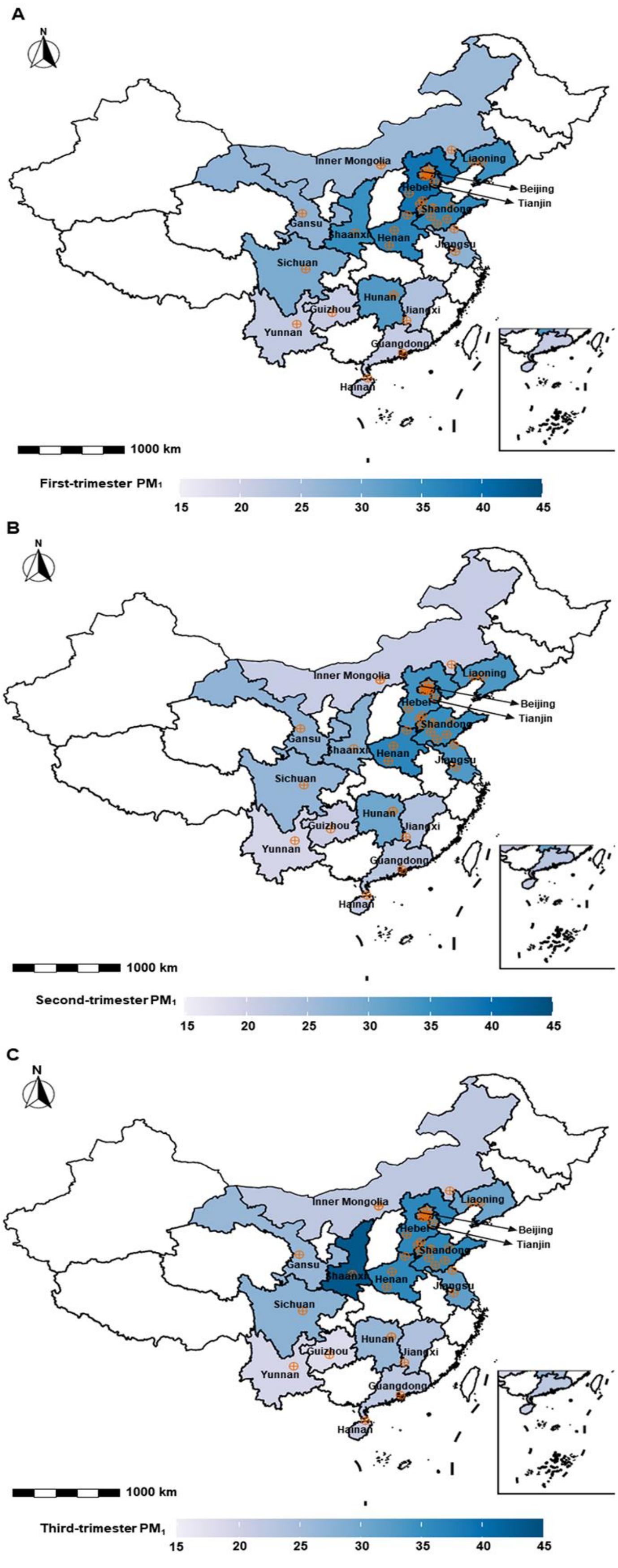

Figure S1. Maps of study locations and PM_1 concentrations in the first (A), second (B), and third (C) trimesters，related to STAR Methods. ⊕represent study locations.

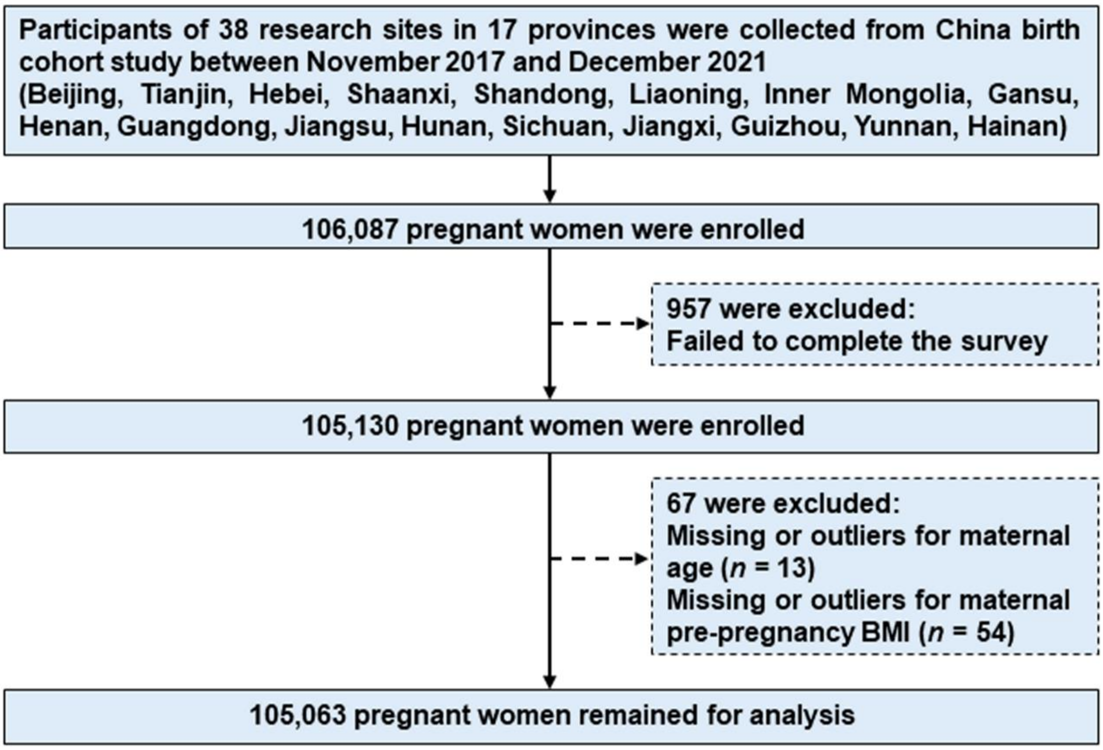

Figure S2. Participants for analysis, related to STAR Methods. BMI, body mass index.

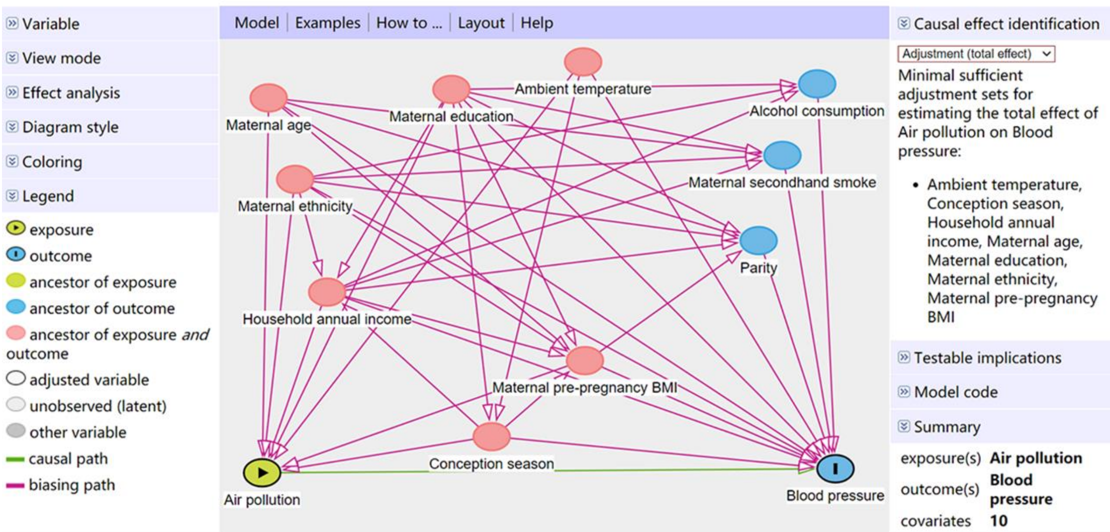

Figure S3. Directed acyclic graph for the association between ambient air pollution and blood pressure, created with the help of dagitty.net., related to STAR Methods. Pink markers indicate potential confounders. BMI, body mass index.

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