Supplementary Materials

Koman, Patricia D., Kelly A. Hogan, Natalie Sampson, Rebecca Mandell, Chris M. Coombe, Myra M. Tetteh, Yolanda R. Hill-Ashford, et al. "Examining Joint Effects of Air Pollution Exposure and Social Determinants of Health in Defining 'At-Risk' Populations Under the Clean Air Act: Susceptibility of Pregnant Women to Hypertensive Disorders of Pregnancy." *World Medical & Health Policy* 10, no. 1 (March 1, 2018): 7–54. https://doi.org/10.1002/wmh3.257.

Table S1. Summary of Studies Examining Joint Effect of Air Pollution and Social Determinants of Health in Associations with HDP in U.S.

Study	Location	Study Design	Population	Covariates	Social Stressors & Pre-Existing Chronic Conditions	PM and Ozone Metric	Outcome(s)	Inter-action	Adjusted effect estimate /main findings (95% CI)
Wu et al. 2009	Los Angeles and Orange Counties, USA (1997 -2006)	Birth records	N=81,186 pregnancies (n=2,442 PE cases) Included singleton births. Excluded subjects with missing residential data	Age, education, race/ethnicity, diabetes, parity, prenatal care insurance type, poverty and season of conception	Stratification by study region, race, poverty, insurance type, infant sex, maternal age, parity, delivery type and method, and health conditions (diabetes)	Modeled air quality using CALine4 line-source dispersion models with EMFAC2007 emissions model to estimate entire pregnancy traffic exposures <3 km from traffic, Mean traffic-related PM during entire pregnancy 1.82 μg/m^3 (SD 1.33) and IQR 1.35	Preeclampsia (PE)		$PM_{2.5}$ CALINE4 OR 1.11 (1.06-1.15) per IQR traffic-$PM_{2.5}$ of 1.35 μg/m^3 during entire pregnancy. For pregnant women in the highest traffic exposure quartile, OR = 1.42 (1.26–1.59)
								Race/ethnicity, poverty, diabetes status	No significant differences in effect estimates when stratified by study region, race/ethnicity, poverty, infant sex, parity, delivery type (spontaneous vs. nonspontaneous), delivery method (vaginal vs. cesarean section), diabetes status (for PE), and PE (for preterm birth).
								Insurance payor	Although higher risk of PE was observed among privately insured women v. public or government-sponsored insurance, authors conclude confounding by age due to high percentage (83%) of older women (> 40 years of age) using private insurance
Wu et al. 2011	Los Angeles and Orange Counties, USA (1997 -2006)	Birth records	N=81,186 pregnancies (n=2,442 PE cases) Included singleton births. Excluded subjects with missing residential data	Age, education, ethnicity, diabetes, parity, prenatal care insurance type, poverty and season of conception	Stratification by study region, race, poverty, insurance type, infant sex, maternal age, and parity	Ambient monitored data, traffic density, and modeled traffic-related $PM_{2.5}$ and NOx using CALine4 line-source dispersion models to estimate entire pregnancy <3 km from traffic, Mean measured during entire pregnancy $PM_{2.5}$ 17.3 (SD 3.5) μg/m^3, IQR 5.1, PM10 32.7 (SD 5.7) μg/m3, IQR 6.8, O3 35.6 (SD 7.5) ppb, IQR 11.5	Preeclampsia (PE)		Ozone OR per IQR enitre pregnancy LA 1.00 (0.86, 1.16); Orange Co. 1.21 (1.06, 1.38)
									$PM_{2.5}$ OR per IQR enitre pregnancy LA 0.90 (0.79, 1.01); Orange Co. 0.98 (0.88, 1.09)
									PM_{10} OR per IQR enitre pregnancy LA 0.97 (0.89, 1.07); Orange Co. 0.98 (0.91, 1.05)
									$PM_{2.5}$ CALINE4 OR per IQR of 1.35 μg/m3 entire pregnancy LA 1.08 (1.02, 1.15); Orange Co. 1.10 (1.04, 1.17)
								Race/ethnicity, poverty, insurance payor	No significant differences in effect estimates when stratified by study region, race/ethnicity, poverty, insurance payor, infant sex, or parity (detailed results not shown)
Rudra et al. 2011	Washington, USA (1996-2006)	Birth cohort	N=3,509 (n=117) Eligible subjects attending prenatal care before week 20. Excluded subjects with maternal age<18 years, non-English language and planned delivery outside study area	Age, education, ethnicity, pairty, prepregnancy BMI, physical activity, employment, householdl income, marital status, history of asthma, diabetes or chronic hypertension, smoking, season and year of conception	Stratification by age, BMI (<25 kg/m^2), ever smoking and environmental tobacco smoke (ETS), employment	Monthly modeled $PM_{2.5}$ from traffic counts, housing density, temperature and monitored air quality using geocoded participant residence	PE	Obesity	Positive association with $PM_{2.5}$ 1.02 (0.93 - 1.12); No interaction with BMI category (p-value not reported)

Study	Location	Study Design	Population	Covariates	Social Stressors & Pre-Existing Chronic Conditions	PM and Ozone Metric	Outcome(s)	Inter-action	Adjusted effect estimate /main findings (95% CI)
Vinikoor-Imler et al. 2012	North Carolina, USA (2000-2003)	Birth records	N=222,775 (n=12,085) Excluded multiple births, infants with congenital abnormalities, birth weight42, missing covariates data and chronic hypertension	Age, education, ethnicity, marital status, neighbourhood deprivation index, parity and smoking	Interaction of PM and neighborhood deprivation index (NDI) category using loglikelihood test. NDI by census tract constructed from % households in poverty, % female-headed households, % households income <$30,000, % households on public assistance, % males in management, % crowded households, % unemployed, % <high school education	Air pollution averaged over entire pregnancy and restricted to women residing within 20 km of PM monitor	Gestational hypertension (GH)		$PM_{2.5}$ RR for a IQR of 2.24 μg/m^3 1.11 (1.08, 1.15) PM_{10} RR for a IQR of 3.92 μg/m^3 1.07 (1.04, 1.11)
							GH	NDI	No interaction was present between NDI categories and $PM_{2.5}$ (p=0.24) using log likelihood test. An interaction was observed with PM_{10} (p <0.05) $PM_{2.5}$ RR for each IQR among women in areas with lowest NDI 1.08 (1.02, 1.14) and 1.12 (1.08, 1.17) for upper 75% of NDI PM_{10} RR for each IQR among women in areas with lowest NDI 1.02 (0.98, 1.07) and 1.10 (1.06, 1.14) for upper 75% NDI
Lee et al. 2012	Pittsburgh (Allegheny County), PA USA (1997-2001)	Cohort, Hospital records	N=1,684 Excluded multiple births, women with chronic hypertension and/or diabetes, gestational age 45 weeks and residential location outside study area	Age, race/ethnicity, parity, smoking (number of cigarettes), vitamin use, BMI, temperature, season of birth and year of conception from hospital-based records	SDOH: Stratification by race/ethnicity (Caucasian and African American)	Ozone and PM using space/time kriging to estimate zip code level exposures for a trimester (12 weeks)	Increase in systolic blood pressure (SBP) between 20 weeks and late pregnancy Increase in diastolic blood pressure (DBP) between 20 weeks and late pregnancy		Ozone 1.47 (-0.10, 3.04) $PM_{2.5}$ 0.40 (-0.66, 1.46) PM_{10} 1.18 (0.10, 2.26) Ozone 0.74 (-0.48, 1.95) $PM_{2.5}$ 0.38 (-0.41, 1.18) PM_{10} 0.48 (-0.35, 1.30)
Lee et al. 2013	Pittsburgh, (Allegheny County), PA USA (1997-2002)	Hospital records	N=34,705; PE (n=1,141) and GH (n=2.078) Excluded multiple births, women with chronic hypertension and/or diabetes, gestational age 45 weeks and residential location outside study area; same as above study	Age, race/ethnicity, parity, smoking (number of cigarettes), season of birth and year of conception from hospital-based records	SDOH: Stratification by race/ethnicity (Caucasian and African American)	Ozone and PM using space/time kriging to estimate zip code level exposures for a trimester (12 weeks)	PE		Ozone OR per IQR 1st trimester 1.12 (0.89, 1.42) $PM_{2.5}$ OR per IQR 1st trimester 1.15 (0.96, 1.39) PM_{10} OR per IQR 1st trimester 1.00 (0.87, 1.15)
							GH		Ozone OR per IQR 1st trimester 1.12 (0.97, 1.29) $PM_{2.5}$ OR per IQR 1st trimester 1.11 (1.00, 1.23) PM_{10} OR per IQR 1st trimester (1.08 (0.98, 1.20) Because of insufficient sample size, interaction and effect measure modification not assessed between air pollution exposure and PE or GH for maternal race/ethnicity and smoking status during pregnancy. Sensitivity analyses stratifying by maternal race/ethnicity, smoking status, preterm delivery (for PE analysis). Although different effect estimates across all strata, effect estimates had wide 95% confidence intervals and thus lacked precision to draw conclusions concerning interaction. No differences when stratified by race/ethnicity
Miranda et al. 2013	North Carolina, USA (2004-2008)	Birth records	N=468,517 (n=25,768) entire state; Included singleton births, subjects with birth number 1-4, non-Hispanic White, non-Hispanic Black, Hispanic, aged 15-40. Excluded infants with congenital anomalies, birth weight 42 and/or missing covariates; excluded women with	Age, education, race/ethnicity, marital status, parity, smoking, maternal nativity, season of birth, tract-level median income and urbanization	SDOH: Controlled for as confounder, but did not directly test education, race/ethnicity, poverty (community census tract-level) income, population density; excluded women with chronic hypertension from study	PM mixture: Proximity to traffic measured by GIS residence <250 m, 250-500, >500m from roadway, traffic volume or density of roadways not included	PE and/or GH		Positive assocation where lower confidence limit includes 1.0; OR with PM mixture proximity to traffic for <250m 1.02 (0.97, 1.06), 250-500m 1.04 (1.00, 1.07) (p<0.1), >500m 1.02 (0.98, 1.06)

Study	Location	Study Design	Population	Covariates	Social Stressors & Pre-Existing Chronic Conditions	PM and Ozone Metric	Outcome(s)	Inter-action	Adjusted effect estimate /main findings (95% CI)
Mobasher et al. 2013	Los Angeles, CA USA (1996-2008)	Case-control	N=298 (n=136) predominantly Hispanic women. Excluded multiple pregnancies, women with lupus, chronic renal disease, sickle cell disease or trait	Age, race/ethnicity, parity, exposure to second hand smoke, parity, smoking and year of conception	Medical condition BMI: obesity category (BMI ≥30 kg/m^2)	Trimester averages constructed from 24-hour average based on residential address using EPA Air Quality System and the Southern California Children's Health Study. Ozone was correlated with $PM_{2.5}$ but uncorrelated with PM_{10}	Hypertensive disorders of pregnancy (HDP)		Ozone OR 1st trimester 0.91 (0.54, 1.52); 2nd trimester 2.05 (1.22, 3.46), 3rd trimester 1.19 (0.71, 1.98) $PM_{2.5}$ OR 1st trimester 3.94 (1.82, 8.55), 2nd trimester 1.86 (0.95, 3.63), 3rd trimester 1.44 (0.76, 2.70) PM_{10} OR 1st trimester 0.76 (0.43, 1.36), 2nd trimester 0.76 (0.44, 1.32), 3rd trimester 1.41 (0.77, 2.57)
				Age, exposure to second hand smoke, parity, smoking and year of conception, BMI (note 17 missing BMI measures); chronic hypertension, diabetes, or asthma measured but not included in reported models	Likelihood ratio test for interaction between air pollution and BMI category	Odds ratio calculated per 2 standard deviations increase in trimester-long pollutant average; Note that most cases were diagnosed after 35 weeks, mixing pre- and post-diagnosis exposure among cases for third trimester analyses	HDP	Obesity and Ozone	P-value interaction p=0.17 in first trimester; OR 0.68 (0.36, 1.29) among nonobese and 1.42 (0.44, 4.57) among obese
							HDP	Obesity and $PM_{2.5}$	P-value interaction p=0.06 in first trimester; OR 8.63 (3.10, 24.14) among nonobese and 0.72 (0.14, 3.56) among obese
								Obesity and PM_{10}	P-value interaction p=0.97 in first trimester; OR 0.75 (0.36, 1.55) among nonobese and 0.89 (0.26, 3.09) among obese
Xu et al. 2014	Jacksonville, FL USA (2004-2005)	Birth records	N=22,041 (n=1,037) Included live born singleton births. Excluded infants with congenital abnormalities, low birth weight, gestational age <24 weeks or >42 weeks, previous preterm birth, chronic hypertension, missing residential data and living far from monitor	Age, ethnicity, education, marital status, prenatal care, season of conception, smoking and track median household income	Multiple pollutants at low concentrations, and stratified by race/ethnicity, diabetes status, and education level	Closest EPA AQS monitor <20 km distance (note only 2 active $PM_{2.5}$ and 2 ozone monitors); ozone and $PM_{2.5}$ correlation 0.20	HDP		Ozone OR for IQR 1st trimester 1.00 (0.84,1.19) , 2nd trimester 0.94 (0.82, 1.07), entire pregnancy 0.98 (0.87-1.11) $PM_{2.5}$ OR for IQR 1st trimester 1.10 (0.99, 1.23), 2nd trimester 1.28 (1.13, 1.46), entire pregnancy 1.24 (1.08, 1.43) Two pollutant models of ozone and $PM_{2.5}$: OR for IQR increase 1st trimester ozone 1.05(0.87-1.26), 2nd trimester 1.03(0.89-1.18), entire pregnancy 1.03(0.89-1.18): OR for IQR increase $PM_{2.5}$ 1st trimester 1.11 (0.99, 1.25), 2nd trimester 1.30 (1.13, 1.48), entire pregnancy 1.25 (1.08, 1.44)
					Stratified by race/ethnicity (Non-Hispanic White, non-Hispanic Black, Others)		HDP	Ozone with race/ ethnicity	Ozone no associations in any race category in adjusted models for 1st or second trimester or entire
							HDP	$PM_{2.5}$ with race/ ethnicity	$PM_{2.5}$ OR for entire pregnancy among non-Hispanic White 1.35 (1.13, 1.61), no association among non-Hispanic Black 1.00 (0.080, 1.26), and Others 1.59 (1.04, 2.44); Similar but nonsignificant results for 1st trimester; 2nd trimester non-Hispanic White 1.29 (1.10, 1.52), non-Hispanic Black 1.16 (0.94, 1.43), and Others 1.80 (1.20, 2.71)
					Stratified by education status (< high school, high school graduate, > high school)		HDP	Ozone with education	Ozone no associations in any education category in adjusted models for 1st or second trimester or entire pregnancy
							HDP	$PM_{2.5}$ with education	$PM_{2.5}$ OR entire pregnancy < HS 1.10 (0.79, 1.54), HS 1.18 (0.93, 1.49), > HS 1.32 (1.10, 1.58); 1st trimester < HS 1.08 (0.83, 1.39) HS 0.98 (0.81, 1.17), > HS 1.19 (1.03, 1.37); 2nd trimester <HS 1.16 (0.83, 1.62), HS 1.31 (1.05, 1.63), > HS 1.30
					Medical condition: stratified by gestational diabetes (GD) status N=568, n(GD+HDP)= 58		HDP	Ozone with gestational diabetes	Ozone OR entire pregnancy among those with GD 1.53 (0.92, 2.61) v. nonGD 0.95 (0.85, 1.08); 1st trimester with GD 1.09 (0.56, 2.20) v. nonGD 0.99 (0.83, 1.19); 2nd trimester with GD 1.18 (0.68, 2.01) v. nonGD 0.92 (0.80, 1.05)
							HDP	$PM_{2.5}$ with gestational diabetes	$PM_{2.5}$ OR entire pregnancy among those with GD 1.45 (0.82, 2.64) v. nonGD 1.23 (1.06, 1.42); 1st trimester with GD 1.53 (0.96, 2.50) v. nonGD 1.08 (0.96, 1.21); 2nd trimester with GD 1.05 (0.65, 1.69) v. 1.31 (1.15, 1.49)

Study	Location	Study Design	Population	Covariates	Social Stressors & Pre-Existing Chronic Conditions	PM and Ozone Metric	Outcome(s)	Inter-action	Adjusted effect estimate /main findings (95% CI)
Savitz et al. 2015	New York City, NY USA (2008-2010)	Hospital discharge records	N=268,601; mild PE n=6,940, severe PE n=4,226, GH n =5,834, and total HDP n=17,000; from 41 hospitals excluded smokers and those with chronic hypertension and multiple births	Age, parity (0, 1, or ≥ 2), conception year, body mass index (BMI), BMI^2, and Medicaid status as proxy for SES, hospital, social deprivation index	Medical condition: BMI, SDOH: education, SES (based on government insurance eligibilty), social deprivation index (SDI). SDI was comprised of % with college degree, % unemployment, % management/professional occupation, % residential crowding, % below 200% of the federal poverty line, % of households receiving public assistance, and % nonwhite race	$PM_{2.5}$ at maternal residence by trimester from New York City Community Air Survey using 150 monitoring stations combined with land use regression model using kriging. SDI are weakly negatively correlated with $PM_{2.5}$ in New York	mild PE		Main adjusted effect $PM_{2.5}$ no association in the first or second trimester for mild PE; negative association for mild PE but the addition of hospital attenuated results. 1st trimester OR per 10 $\mu g/m^3$: mild PE 0.82 (0.73, 0.92), mild PE with hospital adjustment 0.88 (0.78, 1.0); 2nd trimester OR: mild PE 0.8 (0.7, 0.9), mild PE with hospital adjustment 0.91 (0.80, 1.0)
							Severe PE		Main adjusted effect $PM_{2.5}$ positive association but lower CI crosses 1.0 for exposures in the first and second trimesters for severe PE; the addition of hospital attenuated results. 1st trimester OR per 10 $\mu g/m^3$: severe PE 1.1 (0.91, 1.2), severe PE with hospital adjustment 0.95 (0.82, 1.1); 2nd trimester OR: severe PE 1.1 (0.93, 1.3), severe PE with
							GH		Main adjusted effect $PM_{2.5}$ positive association in the first or second trimester, but the addition of hospital attenuated results. 1st trimester OR per 10 $\mu g/m^3$: 1.7 (1.5, 1.0), 2nd trimester OR: 1.6 (1.4, 1.8)
							Total hypertensive disorders of pregnancy (HDP)		Main adjusted effect $PM_{2.5}$ positive association with lower confidence bound crossing 1.0 for HDP in the first and second trimester but the addition of hospital attenuated results. 1st trimester OR per 10 $\mu g/m^3$: Total HDP 1.1 (1.0, 1.2), 2nd trimester OR: Total HDP 1.1 (1.0, 1.2)
Männistö et al. 2015 Consortium on Safe Labor	12 centers (19 hospitals; 15 hospital referral regions) across USA[a] 2002–2008	retrospective cohort; ordinal logistic regression for odds of being in a higher blood pressure category	N=151,276 births at ≥23 weeks gestation assembled using hospital delivery admission electronic medical records (both mother and neonate charts) excluded multifetal pregnancies, deliveris <37 weeks, women with eclampsia and missing variables	Age, race/ethnicity (non-Hispanic White, non-Hispanic Black, Hispanic, Hispanic, Asian/Pacific Islander, Other, Unknown), pre-pregnancy BMI category (underweight <18.5, normal weight 18.5 to <25 kg/m^2, overweight 25 to <30 kg/m^2, obese 30 to 34.9 kg/m^2, severly obese > 35.0 kg/m^2, unknown), nulliparous, insurance status (public/self-pay, private, other, unknown), smoking during pregnancy, antihypertensive medication use, admission time, site, spontaneous labor, and number of pregnancies in the cohort were all derived from the electronic medical records	Medical condition: Modeled interaction between hypertensive disorder diagnosis and air pollution	Ozone, $PM_{2.5}$, PM_{10}, elemental carbon, NO_x, SO_2, CO	Hypertensive blood pressure upon admission to labor and delivery		No association among normal-tensive women for ozone (OR 4-hour lag 0.997 (0.993 -1.0) per 5 ppm), $PM_{2.5}$ (OR 4-hour lag 1.000 (0.999-1.002) per 1 $\mu g/m^3$) or PM_{10} (OR 4-hour lag 0.998 (0.993-1.002)) ; 1.002(1.001 - 1.003) for 1 $\mu g/m^3$ nitrate (for all lags) and 0.998 (0.998 - 0.999) sulfates
					Medical condition of GE, PE, Chronic hypertension or superimposed PE (both hypertension from different cause and PE)	Modeled pollution with Community Multi-Scale Air Quality (CMAQ) 36 km grid; 0-4 hour pre-admission period; Hourly exposure estimates were averaged across the delivery hospital referral region and weighted for population density to estimate windows of exposure for each pregnancy as a proxy for maternal residence and local mobility. The size of hospital referral regions ranged from 415 to 312,644 square km		Among those with GH, odds of higher BP category upon admission after air pollution exposure	No significant differences (in those with GH) BP RR from normal tensive women: for 4-hr Ozone with GH 0.98 (0.963–0.998), $PM_{2.5}$ 1.005 (0.997, 1.014), PM_{10} 1.015 (0.99, 1.041)
								Among those with PE, odds of higher BP category upon admission after air pollution exposure	RR for 4-hr ozone with PE 0.979 (0.965, 0.993) (interaction p<0.05); $PM_{2.5}$ 1.003 (0.997, 1.009), PM_{10} 1.025 (1.003, 1.047) (interaction P<0.05)
								Among those with chronic HT, odds of higher BP category upon admission after air pollution exposure	No significant differences (in those with chronic HT) BP RR from normal tensive women: for 4-hr ozone with HT 1.013 (0.988–1.038), $PM_{2.5}$ 0.998 (0.998, 1.008), PM_{10} 0.986 (0.952, 1.020)
								Among those with Superimposed PE, odds of higher BP category upon admission after air pollution exposure	RR for 4-hr ozone with Superimposed PE 1.080 (1.029, 1.132) (interaction p<0.05); and no significant differences $PM_{2.5}$ 1.015 (0.995, 1.036), PM_{10} 1.043 (0.964, 1.129)

Study	Location	Study Design	Population	Covariates	Social Stressors & Pre-Existing Chronic Conditions	PM and Ozone Metric	Outcome(s)	Inter-action	Adjusted effect estimate /main findings (95% CI)
Mendola et al. 2016 Consortium on Safe Labor/ Air Quality and Reproductive Health Study	12 centers (19 hospitals; 15 hospital referral regions) across USA[a] (2002–2008)	retrospective cohort	N=210,508 births at ≥23 weeks gestation assembled using hospital delivery admission electronic medical records (both mother and neonate charts)	Age, race/ethnicity (White, Black, Hispanic, Asian/Pacific Islander, Other/Unknown), pre-pregnancy BMI category (underweight <18.5, normal weight 18.5 to <25, overweight 25 to <30, obese ≥30, unknown), parity (nulliparous, primiparous, multiparous), marital status (married, divorced/widowed, single, unknown), insurance status (public, private, other, unknown), smoking and alcohol use during pregnancy (both yes/no) were all derived from the	Medical condition: asthma and obesity	Ozone, $PM_{2.5}$, PM_{10}, elemental carbon, NO_x, SO_2, CO Modeled pollution with CMAQ 36 km grid; Hourly exposure estimates were averaged across the delivery hospital referral region and weighted for population density to estimate windows of exposure for each pregnancy as a proxy for maternal residence and local mobility. The size of hospital referral regions ranged from 415 to		Among those with asthma, RR of PE per IQR increase in air pollution	RR over entire pregnancy for IQR ozone with asthma 0.98 (0.88–1.09) was not signifcantly different from pregnant women with no asthma 0.95 (0.91–1.01). Similar lack of association for preconception and each trimester as exposure RR over entire pregnancy for IQR $PM_{2.5}$ with asthma 1.07 (0.93–1.24) was not signifcantly different from pregnant women with no asthma 1.02 (0.94–1.11). Similar lack of association for preconception and each trimester as exposure window. Elemental carbon RR over entire pregnancy was significantly different for those with and without asthma ($p<0.05$) 1.11 (1.03–1.21) with asthma and 1.03 (0.99–1.06) without asthma
								Obesity	Authors stratified by obesity status but did not report results

[a]Consortium on Safe Labor include Baystate Medical Center, Springfield, MA; Cedars-Sinai Medical Center Burnes Allen Research Center, Los Angeles, CA; Christiana Care Health System, Newark, DE; Georgetown University Hospital, MedStar Health, Washington, DC; Indiana University Clarian Health, Indianapolis, IN; Intermountain Healthcare and the University of Utah, Salt Lake City, Utah Maimonides Medical Center, Brooklyn, NY; MetroHealth Medical Center, Cleveland, OH.; Summa Health System, Akron City Hospital, Akron, OH; The EMMES Corporation, Rockville MD (Data Coordinating Center); University of Illinois at Chicago, Chicago, IL; University of Miami, Miami, FL; and University of Texas Health Science Center at Houston, Houston, Texas.

Table S2. Exposure Assessment and Case Ascertainment Methods by Study

Study	Social Factors and Pre-Existing Medical Conditions	Exposure Assessment of Social Factors	PM and Ozone Metric	Exposure Assessment of Air Pollution Metric	Outcome(s)	Case Ascertainment Method
Wu et al. 2009	Stratification by study region, race, poverty, insurance type, and diabetes	Used US Census 2000 data for poverty; hospital-based birth database from Memorial Health Care System (4 hospital network)	Modeled air quality using CALine4 line-source dispersion models with EMFAC2007 emissions model to estimate entire pregnancy traffic exposures <3 km from traffic; mean traffic-related PM during entire pregnancy 1.82 $\mu g/m^3$ (SD 1.33) and IQR 1.35 $\mu g/m^3$	CALine4 is a Gaussian dispersion model that employs a mixing zone concept to characterize dispersion over the roadway; other ambient pollution would not be well-characterized; CALine4 estimates compared with ambient measurements with moderate to high (R=0.55 to 0.95) correlations with NO_x; PM is not reported, but other studies observe systematic underestimates of traffic-related $PM_{2.5}$ (Kang and Batterman 2010). Detailed annual average traffic counts, vehicle fractions and road conditions were included; hourly windspeed and direction were employed. Modeling provides estimate of pollution exposures within 3 km and full temporal estimates. Assignment of matenal exposure were based solely on maternal address at time of birth, and this study's findings may be more affected by residential mobility than other studies because of the spatial resolution.	Preeclampsia (PE)	Hospital-based birth database from Memorial Health Care System (4 hospital network) which is considered superior to birth certificate records; used combination of date of last menstrual period and ultrasound data; diagnosis dates for PE onset not available
Wu et al. 2011	Stratification by study region, race, poverty, and insurance type	Used US Census 2000 data for poverty; hospital-based birth database from Memorial Health Care System (4 hospital network)	Ambient monitored data, traffic density, and modeled traffic-related $PM_{2.5}$ and NO_x using CALine4 line-source dispersion models to estimate entire pregnancy <3 km from traffic; mean measured during entire pregnancy $PM_{2.5}$ 17.3 (SD 3.5) $\mu g/m^3$, IQR 5.1, PM_{10} 32.7 (SD 5.7) $\mu g/m^3$, IQR 6.8, O_3 35.6 (SD 7.5) ppb, IQR 11.5 ppb	PM is estimated only from CALINE4 (See above entry)	PE	Hospital-based birth database from Memorial Health Care System (4 hospital network) which is considered superior to birth certificate records; used combination of date of last menstrual period and ultrasound data; diagnosis dates for PE onset not available
Rudra et al. 2011	Stratification by BMI (<25 kg/m^2)	Used data from the Omega Study (Butler et al. 2004) with questionnaire and hospital records for antropmetric, behavioral and medical traits	Monthly modeled $PM_{2.5}$ from traffic counts, housing density, temperature, and monitored air quality using geocoded participant residence	Created monthly averages based on maternal residence and pollution model with R^2 of 0.41 and root mean square error of 2.5 $\mu g/m^3$ (10% of range)	PE	Used data from the Omega Study (Butler et al. 2004) defining PE as ACOG criteria of >140/90 mm HG and proteinuria concentrations of 30 mg/dL or 1+ on two or more urine dipsticks

Study	Social Factors and Pre-Existing Medical Conditions	Exposure Assessment of Social Factors	Exposure Assessment of Air Pollution: PM and Ozone Metric	Exposure Assessment of Air Pollution: Metric	Outcome(s)	Case Ascertainment Method
Vinikoor-Imler et al. 2012	Interaction of PM and neighborhood deprivation index (NDI) category using loglikelihood test. NDI by census tract constructed from % households in poverty, % female-headed households, % house-hold income <$30,000, % households on public assistance, % males in management, % crowded households, % unemployed, % <high	North Carolina (NC) Detailed Birth Record data were used for covariates age, education, race/ ethnicity, marital stats, parity and smoking status; NDI from tract-level data from 2000 US Census	Air pollution averaged over entire pregnancy and restricted to women residing <20 km of PM monitor	US Environmental Protection Agency (EPA) Air Quality System (AQS) monitors on every 1st, 3rd, or 6th day and closest single monitor linked to maternal address; birth date and gestational age from birth records used to estimate gestational period; women excluded if >20 km from an AQS monitor (excluded 146,907 women, 37% of geocoded women)	Gestational hypertension (GH), PE	NC State Center for Health Statistics Detailed Birth Record data were obtained for outcome(s) and maternal address for geocoding; women excluded if geocoded address not available or air quality monitoring <75% complete; excluded multiple births, infants with congenital abnormalities, birth weight <400 g, gestational age <24 or >42 weeks, and mothers with chronic hypertension (HT)
Lee et al. 2012	Stratification by race/ethnicity (Caucasian and African American)	Subjects selected from the Prenatal Exposures and Preeclampsia Prevention Study, which included prenatal care before 16 weeks of gestation, variables obtained from interviews and baseline medical histories	Ozone and PM using space/time kriging to estimate zip code level exposures for a trimester (12 weeks)	Zipcode centroid data based on US EPA AQS data for Allegheny County and within 50 km of county boundary (15 stations for ozone, 23 stations monitoring 1st, 3rd, or 6th day for PM); used space-time ordinary kriging to estimate daily air pollution at each centroid of a 13.4 km^2 grid; used ultrasound at each clinic visit to estimate gestational age and date of infant delivery; calculated exposure during each trimester by averaging the concentration at each centroid of the grid within each zip code; 109 zip codes in county with mean area of 16.8 km^2	Increase in systolic blood pressure (SBP) and diastolic blood pressure (DBP) between 20 weeks and late pregnancy	Medical records from the Prenatal Exposures and Preeclampsia Prevention Study; BP taken by clinic nursing staff with the patient seated and the cuff at the level of the subject's heart. Excluded women with chronic HT and diabetes (n=32), those without BP measurements before 20 weeks of gestation; those outside of Allegheny County, and multiparous women previously surveyed (excluded n=1684)
Lee et al. 2013	Stratification by race/ethnicity (Caucasian and African American)	Data from Magee Obstetric Medical and Infant (MOMI) database, from Magee Women's Hospital medical records	Ozone and PM using space/time kriging to estimate zip code level exposures for a trimester (12 weeks)	Zipcode centroid data based on US EPA AQS data for Allegheny County and within 50 km of county boundary (15 stations for ozone, 23 stations monitoring 1st, 3rd, or 6th day for PM); used space-time ordinary kriging to estimate daily air pollution at each centroid of a 13.4 km^2 grid; used ultrasound at each clinic visit to estimate gestational age and date of infant delivery; calculated exposure during each trimester by averaging the concentration at each centroid of the grid within each zip code; 109 zip codes in county with mean area of 16.8 km^2	PE, GH	Data from Magee Women's Hospital MOMI medical records database. Excluded multiple births, those with chronic HT, diabetes, gestation <15 or >45 weeks, or residential zip code outside of Allegany county (excluded n=34,705)

Study	Social Factors and Pre-Existing Medical Conditions	Exposure Assessment of Social Factors	Exposure Assessment of Air Pollution PM and Ozone Metric	Exposure Assessment of Air Pollution Metric	Outcome(s)	Case Ascertainment Method
Miranda et al. 2013	Education, race/ ethnicity, poverty (community census tract-level), income, population density; excluded women with chronic hypertension from study	2000 US Census data	PM mixture: Proximity to traffic measured by GIS residence <250 m, 250-500, >500m from roadway, traffic volume or density of roadways not included	Used linear distance between geocoded residential address at delivery and nearest major roadway using 2006 Second edition Topologically Integrated Geographic Encoding and Reference (TIGER) streets data using A1, A2, and A3 major roads; did not estimate air quality	PE and/or GH	NC State Center for Health Statistics Detailed Birth Record data to determine outcome(s) and maternal address for geocoding (more than 50%). Records excluded if geocoded address not available; excluded multiple births, infants with congenital abnormalities, birth weight <400 g, gestational age <24 or >42 weeks, or those with missing covariates; included only non-Hispanic white, non-Hispanic Black and Hispanic women
Mobasher et al. 2013	Obesity category (BMI ≥30 kg/m^2)	Hospital records at time of delivery	O_3, $PM_{2.5}$, PM_{10} trimester averages from 24-hour average based on residential address using EPA Air Quality System and the Southern California Children's Health Study. Ozone was correlated with $PM_{2.5}$ but uncorrelated with PM_{10}	US EPA AQS monitors and the Southern California Children's Health Study (CHS); 22-30 monitors for ozone and gaseous pollutants; 20-23 PM monitors with 1,3, and 6th day monitoring standardized to Federal Reference methods; monitor must meet 75% completeness criteria to be used; where AQS and CHS monitors overlapped, CHS monitors were used due to higher level of QA; inverse distance squared weighting of concentration from closest 4 stations within 50 km of residence using data from same stations across entire pregnancy	Hypertensive disorders of pregnancy (HDP)	Cases and controls recruited retrospectively from delivery logs at Los Angeles County, University of Southern California Women's Hospital and Children's Hospital; excluding HT among controls; mild PE defined as SBP >140 mm Hg or DBP >90 mm Hg on 2 or more occasions at least 6 hours apart plus proteinuria >300 mg/dL in 24-hr urine collection or +1 on a dipstick in women who were nornotensive at <20 weeks of gestation; severe PE defined as SBP >160 mm Hg or DBP >110 mm Hg on 2 or more occasions at least 6 hours apart plus proteinuria >500 mg/dL in 24-hr urine collection or +3 on a dipstick; GH was BP (mild or severe) without evidence of proteinuria; eclampsia defined as HT with or without proteinuria plus at least one observed seizure disorder; Hemolysis Elevated Liver Enzyme Low Platelet count syndrom defined as hemolysis, elevated liver enzymes >70 IU/L, and low platelets <100,000 nm^3. Partial HELLP as two of the previous three conditions; women with lupus, chronic renal disease, multiple gestations or sickle cell disease/trait were excluded; pregnancy period defined by date of last menstrual period and ultrasound measurements
Xu et al. 2014	Multiple pollutants at low concentrations, and stratified by race/ethnicity (Non-Hispanic White, non-Hispanic Black, Others), diabetes status, and education status (< high school, high school graduate, > high school)	Variables constructed into categories using birth record data obtained from the Bureau of Vital Statistics and Office of Health Statistics and Assessment, Florida (FL) Department of Health	Closest EPA AQS PM monitor <20 km distance (note only 2 active PM2.5 and 2 ozone monitors); ozone and PM2.5 correlation 0.20	US EPA AQS data (2 ozone, 2 $PM_{2.5}$ monitors, 3 PM_{10} monitors); closest single monitor used within 20 km; no completeness criteria reported	HDP (GH, PE or Eclampsia)	Birth record data obtained from the Bureau of Vital Statistics and Office of Health Statistics and Assessment, FL Department of Health; excluded infants with congenital abnormalities, birthweight <400g or gestational age <24 or >42 weeks; women were excluded who had plural deliveries, previous pre-term births, chronic HT or lack of geocoded address

Study	Social Factors and Pre-Existing Medical Conditions	Exposure Assessment of Social Factors	Exposure Assessment of Air Pollution PM and Ozone Metric	Exposure Assessment of Air Pollution Metric	Outcome(s)	Case Ascertainment Method
Savitz et al. 2015	BMI, education, SES (based on government insurance eligibilty), social deprivation index (SDI) comprised of % with college degree, % unemployment, % management/ professional occupation, % residential crowding, % below 200% of the federal poverty line, % of households receiving public assistance, and %	Birth certificates were linked to hospital discharge data from the New York (NY) State Department of Health Statewide Planning and Research Cooperative System	$PM_{2.5}$ at maternal residence by trimester	Used city-wide spatial variation followed by temporal adjustment to match to gestational exposure period using 150 monitoring stations from NY Community Air Survey and regression of GIS buffers of emissions and land use variables to construct estimates within 300 m of each maternal address (R^2 $PM_{2.5}$ 0.83)	mild PE, severe PE, GH, and total hypertensive disorders of pregnancy (HDP)	Birth certificates were linked to hospital discharge data from the NY State Department of Health Statewide Planning and Research Cooperative System; women were excluded who had plural deliveries or were smokers or had pre-pregnancy HT; excluded birthweights <500 g or >5,000 g, or missing covariate information; used International Classification of Diseases (ICD-9-CM); used clinical estimates using ultrasound to establish pregnancy period
Männistö et al. 2015 Consortium on Safe Labor	Interaction between previous hypertensive disorder diagnosis (PE, GH,) and (0 hour, 1-4 hour lag) lagged air pollution prior to BP measurement	Electronic medical records from Consortium on Safe Labor from 19 US hospitals using ICD-9 codes; women considered normotensive if they had no indication of HDP	Ozone, $PM_{2.5}$, PM_{10}, elemental carbon, NO_x, SO_2, CO (0 hour, 1-4 hour lag before BP reading)	Modeled pollution with Community Multi-Scale Air Quality (CMAQ) 36 km grid fused with inverse-distance weighted US EPA AQS monitored data; 0-4 hour pre-admission period; no adjustment for long-term air pollution; Hourly exposure estimates were averaged across the delivery hospital referral region and weighted for population density to estimate windows of exposure for each pregnancy as a proxy for maternal residence and local mobility. The size of hospital referral regions ranged from 415 to 312,644 km^2	Hypertensive blood pressure (BP) upon admission to labor and delivery	Clinical BP was measured by hospital staff upon admission to labor/delivery using standard equipment; normal BP defined as SBP <120 mm Hg and DBP < 80 mm Hg; high normal BP defined as SBP 120-139 mm Hg and DBP <90 mm Hg or DBP 80-89 mm Hg and SBP <140 mm Hg; mild hypertension defined as SBP 140-149 mm Hg and DBP <100 mm Hg or DBP 90-99 mm Hg and SBP <150 mm Hg; moderate hypertension defined as SBP 150-159 mm Hg and DBP <110 mm Hg or DBP 100-109 mm Hg and SBP <160 mm Hg; severe hypertension SBP >160 mm Hg (with any diastolic) or DBP >110 mm Hg (with any systolic)
Mendola et al. 2016 Consortium on Safe Labor/ Air Quality and Reproductive Health Study	Asthma and obesity	Electronic medical records from Consortium on Safe Labor from 19 US hospitals using maternal discharge summary and ICD-9 codes; asthma diagnosis was recorded in medical record or discharge summary (ICD-9 493.0-493.9)	Ozone, $PM_{2.5}$, PM_{10}, elemental carbon, NO_x, SO_2, CO	Modeled pollution with CMAQ 36 km grid fused with inverse-distance weighted US EPA AQS monitored data; hourly exposure averaged across hospital referral region and weighted for population density as proxy for maternal residence; pre-conception period was 90 days prior to last menstrual period based on best obstetrical estimate of gestational age; hourly exposure estimates were averaged across the delivery hospital referral region and weighted for population density to estimate windows of exposure for each pregnancy as a proxy for maternal residence and local mobility; the size of hospital referral regions ranged from 415 to 312,644 km^2; used temporal changes, not geographic differences in air pollution	PE	Electronic medical records from Consortium on Safe Labor from 19 US hospitals using maternal discharge summary and ICD-9 codes (642.4 mild or unspecified, 642.5 severe); excluded multi-fetal pregnancies, women with chronic HT, GH, and superimposed PE to compare PE cases to normotensive reference group

Table S3. Summary of Studies Examining Joint Effect of Air Pollution and Social Determinants of Health in Associations with HDP in U.S.

Social Determinant of Health (SDoH)	Study	Analysis	Pollutant	Result
Poverty (SES, education, Neighboorhood Deprivation Index (NDI), median housing value, individual and neighborhood or county-level income)	Wu et al. 2009	Poverty, insurance type (income-tested); stratification	Traffic-related modeled $PM_{2.5}$	Greater odds of preeclampsia (PE) among privately insured v. public insurance, but authors indicate results likely confounded by maternal age; no difference in association when stratified by poverty
	Wu et al. 2011	Poverty, (% living below poverty level based on U.S. Census block group for 2000); insurance type (income-tested); stratification	Ozone, $PM_{2.5}$, PM_{10}, and Traffic-related modeled $PM_{2.5}$	No difference in association for PE, detailed results not presented
	Vinikoor-Imler et al. 2012	Neighborhood deprivation index (NDI) from census tract-level percent households in poverty, percent female-headed households with dependents, percent households income <$30,000, percent households on public assistance, percent of males in management or professional occupation, percent living in crowded housing, percent unemployed, percent without high school (HS) education	$PM_{2.5}$	Independent effect of NDI on GH: Adjusting for $PM_{2.5}$ and covariates, the relative risk (RR) of gestational hypertension (GH) for a women with a NDI in the 4th compared to 1st quartile 1.24 (1.14, 1.35)
				No difference in gestational hypertension (GH)-$PM_{2.5}$ RR for each IQR 2.25 $\mu g/m^3$ among women in areas with lowest NDI 1.08 (1.02, 1.14) and 1.12 (1.08, 1.17) for upper 75% of NDI (interaction p=0.24)
			PM_{10}	Independent effect of NDI on GH: Adjusting for PM_{10} and covariates, the RR for a women with a NDI in the 4th compared to 1st quartile 1.27 (1.16, 1.39)
				Higher GH-PM_{10} RR among those with higher NDI; PM_{10} RR for each IQR among women in areas with lowest NDI 1.02 (0.98, 1.07) and 1.10 (1.06, 1.14) for upper 75% NDI (interaction p<0.05)
		Education category as independent risk factor	$PM_{2.5}$	Independent effect of education on GH: Adjusting for $PM_{2.5}$ and covariates, the RR of GH for a women who completed college is lower than a women who completed HS 0.71 (0.67, 0.76); No association among other categories; similar findings for PM_{10} models
	Xu et al. 2014	Education category, stratified by education status (< HS, HS graduate, > HS)	Ozone	No associations with hypertensive disorders of pregnancy (HDP) in any education category in adjusted models for 1st or 2nd trimester or for entire pregnancy
			$PM_{2.5}$	Women with lower education have lower HDP odds ratio (OR) for entire pregnancy and 1st trimester exposure compared to > HS: $PM_{2.5}$ OR entire pregnancy < HS 1.10 (0.79, 1.54), HS 1.18 (0.93, 1.49), > HS 1.32 (1.10, 1.58); 1st trimester < HS 1.08 (0.83, 1.39) HS 0.98 (0.81, 1.17), > HS 1.19 (1.03, 1.37; women with lower education have higher OR for 2nd trimester exposure: <HS 1.16 (0.83, 1.62), HS 1.31 (1.05, 1.63), > HS 1.30 (1.10, 1.54)
	Savitz et al. 2015	NDI from census tract-level percent households below 200% poverty line, percent households on public assistance, percent in management or professional occupation, percent residential crowding, percent unemployed, percent with college degree and percent nonwhite race	$PM_{2.5}$	No association with PE or GH when adjusting for hospital; interaction not reported
Race/ethnicity	Wu et al. 2009	Stratified by race/ ethnicity based on hospital birth records (African American, Hispanic, Asian, White, Other)	Traffic-related modeled $PM_{2.5}$	No difference in association for PE, detailed results not presented
	Wu et al. 2009	Stratified by race/ ethnicity based on hospital birth records (African American, Hispanic, Asian, White, Other)	Ozone, $PM_{2.5}$, PM_{10}, and Traffic-related modeled $PM_{2.5}$	No difference in association for PE, detailed results not presented
	Lee et al. 2012	Stratified by race/ ethnicity in hospital-based cohort (Caucasian, African American)	Ozone	Results of interaction not reported for blood pressure (BP)
			PM_{10}	No difference in association for BP by race category: PM_{10} IQR associated with 1.13 mm HG (-0.26, 2.52) among Caucasian pregnant women and 1.11 mm Hg (-1.24, 3.46) among African American pregnant women; interaction p-value not reported

Social Determinant of Health (SDoH)	Study	Analysis	Pollutant	Result
Race/ethnicity	Lee et al. 2013	Stratified by race/ ethnicity in hospital-based cohort (Caucasian, African American)	Ozone	Positive association with lower confidence bound intersecting 1.0 for PE and for GH
			$PM_{2.5}$	$PM_{2.5}$ associated with PE in Caucasian (OR= 1.21 (0.99, 1.50) cases = 467 but not African American women (OR 0.93 (0.72, 1.20) cases = 200
			PM_{10}	Positive association with lower confidence bound intersecting 1.0 for PE and for GH
				Suggestive evidence that PM_{10} association with GH was greater among African American women OR 1.27 (1.01, 1.60) cases =366 than Caucasian women OR 1.03 (0.91, 1.16) cases = 1,655, but not formally tested
	Xu et al. 2014	Stratified by race/ethnicity (Non-Hispanic White, non-Hispanic Black, Others) based on birth records	Ozone	Positive association with HDP but CI overlaps with 1.0 for 1st trimester among non-Hispanic White and Others but not among non-Hispanic Black; otherwise no associations with HDP in any race category in adjusted models for 2nd trimester or entire pregnancy
			$PM_{2.5}$	HDP OR higher among Others and non-Hispanic White compared with non-Hispanic Black: $PM_{2.5}$ OR for entire pregnancy among non-Hispanic White 1.35 (1.13, 1.61), among non-Hispanic Black 1.00 (0.080, 1.26), and Others 1.59 (1.04, 2.44); Similar but nonsignificant results for 1st trimester; 2nd trimester non-Hispanic whites 1.29 (1.10, 1.52), Blacks 1.16 (0.94, 1.43), and Others 1.80 (1.20, 2.71)
	Mobasher et al. 2013	Primarily Hispanic White women (> 96%) in case-control study	Ozone	Although no direct comparison among racial or ethnic groups, HDP OR per 15 ppb ozone increase 1st trimester 0.91 (0.54, 1.52), 2nd trimester 2.05 (1.22, 3.46), 3rd trimester 1.19 (0.71, 1.98)
			$PM_{2.5}$	Although no direct comparison among racial or ethnic groups, HDP associations are higher than reported in other studies: $PM_{2.5}$ OR per 7 $\mu g/m^3$ 1st trimester 3.94 (1.82, 8.55), 2nd trimester 1.86 (0.95, 3.63), 3rd trimester 1.44 (0.76, 2.70)
			PM_{10}	No association or with $PM_{10;}$ HDP OR 1st trimester 0.76 (0.43, 1.36), 2nd trimester 0.76 (0.44, 1.32), 3rd trimester 1.41 (0.77, 2.57)
	Vinikoor-Imler et al. 2012	Race/ethnicity as independent risk factor	$PM_{2.5}$	Adjusting for $PM_{2.5}$ and covariates, GH RR higher among non-Hispanic black compared to non-Hispanic white women 1.15 (1.10, 1.21); GH RR lower among Hispanics compared to non-Hispanic white women 0.67 (0.61, 0.73); similar associations in PM_{10} models
Pyscho-social Stress	n/a			
Access to Nutrition	n/a			
Access to Healthcare	Wu et al. 2009	Insurance type (private v. government-sponsored means-tested)	Traffic-related modeled $PM_{2.5}$	Greater odds of PE among privately insured v. public insurance, but authors indicate results likely confounded by maternal age
	Wu et al. 2011	Insurance type (private v. government-sponsored means-tested)	Ozone, $PM_{2.5}$, PM_{10}, and Traffic-related modeled $PM_{2.5}$	No difference in PE-air pollution OR, detailed results not reported

Table S4. Summary of Studies Examining Joint Effect of Air Pollution and Pre-Existing Chronic Health Condition in Associations with HDP in U.S.

Chronic Condition	Study	Analysis	Pollutant(s)	Result
Obesity	Rudra et al. 2011	Stratify by BMI <25 kg/m^2	$PM_{2.5}$	No preeclampsia (PE) effect modification (p-value not reported, defined interaction as difference across strata of > 20%)
	Mobasher et al. 2013	Likelihood ratio test for interaction for BMI ≥ 30 kg/m^2	Ozone	Lower HDP odds ratio (OR) with obesity in 3rd trimester (interaction p=0.04) but not in 1st or 2nd; Non-obese OR 1.44 (0.77, 2.70) and obese 1.03 (0.37, 2.91); authors note that exposure misclassification during 3rd trimester is a concern because exposure assigned to women diagnosed during 3rd trimester covered both pre- and post-diagnosis periods
			$PM_{2.5}$	Lower HDP OR with obesity in 1st trimester (interaction p=0.06) but not in 2nd or 3rd; Non-obese OR 8.63 (3.10, 24.14) and Obese 1.39 (0.34, 5.60) per 7 ug/m^3 increase
			PM_{10}	No interaction with obesity in association with HDP; consistent with no association in main effect
	Mendola et al. 2016	BMI ≥ 30 kg/m^2	Ozone, $PM_{2.5}$, PM_{10}	No association with PE
Gestational Diabetes	Xu et al. 2014	Gestational Diabetes (GD); stratification		Suggestive evidence for all hypertensive disorders of pregnancy (HDP), but small sample size hinders interpretation (cases with GD n= 58)
			Ozone	Ozone-HDP OR entire pregnancy among those with GD 1.53 (0.92, 2.61) v. nonGD 0.95 (0.85, 1.08); 1st trimester with GD 1.09 (0.56, 2.20) v. nonGD 0.99 (0.83, 1.19); 2nd trimester with GD 1.18 (0.68, 2.01) v. nonGD 0.92 (0.80, 1.05)
			$PM_{2.5}$	$PM_{2.5}$-HDP OR entire pregnancy among those with GD 1.45 (0.82, 2.64) v. nonGD 1.23 (1.06, 1.42); 1st trimester with GD 1.53 (0.96, 2.50) v. nonGD 1.08 (0.96, 1.21); 2nd trimester with GD 1.05 (0.65, 1.69) v. 1.31 (1.15, 1.49)
Diabetes	Wu et al. 2009	Diabetes, stratification	$PM_{2.5}$	No difference in $PM_{2.5}$- PE association; only NOx OR reported
Asthma	Mendola et al. 2016	Asthma status; test for interaction	Ozone	No association with PE and no difference in association by
			$PM_{2.5}$	No association with PE and no difference in association by asthma status
			PM_{10}	No association with PE and no difference in association by asthma status
			Elemental carbon	Greater PE RR among those with asthma for entire pregnancy 1.11 (1.03, 1.21) v. those without asthma 1.03 (0.99, 1.06) (interaction p<0.05)
Gestational Hypertension	Männistö et al. 2015	Among those with gestational hypertension (GH), odds of higher BP category upon admission after 4-hour lag air pollution exposure; test for interaction	Ozone	No difference in negative association with BP category; with GH 0.98 (0.96, 1.00); compared to normotensive 0.997 (0.99,
			$PM_{2.5}$	No association and no difference in association with BP category
			PM_{10}	No association and no difference in association with BP category
Preeclampsia	Männistö et al. 2015	Among those with PE, odds of higher BP category upon admission after 4-hour lag air pollution exposure; test for interaction	Ozone	Greater negative association with BP category; with PE 0.979 (0.965, 0.993) (interaction p<0.05); compared to normotensive 0.997 (0.99, 1.00)
			$PM_{2.5}$	No association and no difference in association with BP category
			PM_{10}	Greater positive association with BP category; with PE 1.025 (1.003, 1.047) (interaction p<0.05); compared to normotensive 0.998 (0.99, 1.00)
Chronic Hypertension	Männistö et al. 2015	Among those with chronic hypertension (HT), odds of higher BP category upon admission after 4-hour lag air pollution exposure; test for interaction	Ozone	No association with BP category and no difference in association by chronic HT
			$PM_{2.5}$	No association with BP category and no difference in association by chronic HT
			PM_{10}	No association with BP category and no difference in association by chronic HT
Superimposed Preeclampsia	Männistö et al. 2015	Among those with superimposed PE, odds of higher BP category upon admission after air pollution exposure; test for interaction	Ozone	Greater positive association with BP category; with superimposed PE 1.080 (1.029, 1.132) (interaction p<0.05); compared to normotensive 0.997 (0.99, 1.00)
			$PM_{2.5}$	No association with BP category and no difference in association by superimposed PE
			PM_{10}	No association with BP category and no difference in association by superimposed PE