**eAppendix: Short-term Air Pollution Levels and Blood Pressure in Older Women**

**eTable 1.** Associations between an IQR change in air pollutant concentration and blood pressure for single lag days 0-6 based on adjusted models not controlling for calendar time.

**eTable 2**. Associationsa between an IQR change in lag 3-5 day air pollutant concentrations and blood pressure in the WHI in 1) adjusted models and 2) adjusted models not controlling for calendar time.

**eTable 3.** Associations between an IQR change in air pollutant concentration and blood pressure for single lag days 0-6 based on adjusted models (with control for calendar time).

**eTable 4.** Effect modificationa of lag 3-5 day air pollutant concentrations assessed using stratification by BMI, neighborhood SEP, diabetes, dietary sodium intake, combined fruit and vegetable consumption, long-term PM2.5, and US Census region.

**eTable 5.** Summary statistics on the distributions of lag 3-5 day PM2.5 and PM2.5-10 concentrations across levels of effect modifiers during the study period.

**eTable 6.** Summary statistics on the distributions of lag 3-5 day PM10 and NO2 concentrations across levels of effect modifiers during the study period.

**eTable 7.** Single- and two-pollutant adjusted modelsa of lag 3-5 day air pollutant concentrations.

**eTable 8.** Single- and two-pollutant models of lag 3-5 day air pollutant concentrations based on adjusted models stratified by US Census regiona.

**eTable 9**. Results from sensitivity analyses: Associationsa between an IQR change in lag 3-5 day air pollutant concentrations and blood pressure in the WHI after the addition of 10 mmHg among those with anti-hypertensive medication use to estimate non-treated blood pressure.

**eTable 10**. Results from sensitivity analyses: Associationsa between an IQR change in lag 3-5 day air pollutant concentrations and blood pressure in the WHI using additional degrees of freedom (df = 11) for seasonality.

**eTable 11.** Associationsa between an IQR change in long-term (annual) PM2.5 concentrations estimated from two different exposure models and blood pressure in the WHI**.**

**eTable 12.** Results from sensitivity analyses: Associationsa between an IQR change in short-term (lag 3-5 day) and long-term (annual) PM2.5 in the same model and blood pressure in the WHI with long-term PM2.5 estimated from kriging models.

**eTable 13.** Results from sensitivity analyses: Associationsa between an IQR change in lag 3-5 day air pollutant concentrations and blood pressure in the WHI after restriction to complete data on PM2.5.

**eTable 14.** Results from sensitivity analyses: Associationsa between an IQR change in lag 3-5 day air pollutant concentrations and pulse pressure and mean arterial pressure in the WHI.

**eFigure 1.** Associations of an IQR change in lag 3-5 day air pollutant concentrations and systolic blood pressure (SBP) and diastolic blood pressure (DBP) in the WHI comparing adjusted models not controlling for calendar time (top row) and adjusted models with control for calendar time (bottom row; data from Table 2).

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| **eTable 1.** Associationsa between an IQR change in air pollutant concentration and blood pressure for single lag days 0-6 based on adjusted models not controlling for calendar time. | | | | | | |
| **Air pollutant** | **Outcome** | **Lag day** | **N** | **b** | **95% CI** | |
| PM2.5 | SBP | Lag 0 | 157,984 | **-0.09** | **-0.18** | **-0.003** |
|  |  | Lag 1 | 157,984 | **-0.11** | **-0.20** | **-0.01** |
|  |  | Lag 2 | 157,984 | 0.01 | -0.08 | 0.11 |
|  |  | Lag 3 | 157,983 | **0.14** | **0.04** | **0.23** |
|  |  | Lag 4 | 157,832 | **0.12** | **0.02** | **0.22** |
|  |  | Lag 5 | 157,638 | **0.14** | **0.04** | **0.23** |
|  |  | Lag 6 | 157,442 | **0.12** | **0.03** | **0.21** |
|  | DBP | Lag 0 | 157,984 | 0.05 | -0.006 | 0.1 |
|  |  | Lag 1 | 157,984 | 0.01 | -0.04 | 0.06 |
|  |  | Lag 2 | 157,984 | **0.06** | **0.01** | **0.12** |
|  |  | Lag 3 | 157,983 | **0.12** | **0.06** | **0.17** |
|  |  | Lag 4 | 157,832 | **0.16** | **0.10** | **0.22** |
|  |  | Lag 5 | 157,638 | **0.14** | **0.08** | **0.19** |
|  |  | Lag 6 | 157,442 | **0.12** | **0.07** | **0.17** |
| PM10 | SBP | Lag 0 | 356,319 | **-0.16** | **-0.22** | **-0.1** |
|  |  | Lag 1 | 356,319 | **-0.19** | **-0.25** | **-0.13** |
|  |  | Lag 2 | 356,319 | 0.002 | -0.06 | 0.06 |
|  |  | Lag 3 | 356,319 | **0.1** | **0.04** | **0.16** |
|  |  | Lag 4 | 354,962 | **0.1** | **0.04** | **0.17** |
|  |  | Lag 5 | 353,738 | 0.06 | -0.005 | 0.12 |
|  |  | Lag 6 | 352,490 | **0.09** | **0.03** | **0.15** |
|  | DBP | Lag 0 | 356,319 | -0.03 | -0.06 | 0.01 |
|  |  | Lag 1 | 356,319 | **-0.06** | **-0.1** | **-0.03** |
|  |  | Lag 2 | 356,319 | 0.004 | -0.03 | 0.04 |
|  |  | Lag 3 | 356,319 | **0.05** | **0.01** | **0.08** |
|  |  | Lag 4 | 354,962 | **0.05** | **0.01** | **0.08** |
|  |  | Lag 5 | 353,738 | **0.04** | **0.005** | **0.07** |
|  |  | Lag 6 | 352,490 | **0.08** | **0.05** | **0.11** |
| PM2.5-10 | SBP | Lag 0 | 157,984 | **-0.14** | **-0.23** | **-0.05** |
|  |  | Lag 1 | 157,984 | **-0.15** | **-0.24** | **-0.06** |
|  |  | Lag 2 | 157,984 | 0.04 | -0.05 | 0.13 |
|  |  | Lag 3 | 157,983 | 0.02 | -0.07 | 0.11 |
|  |  | Lag 4 | 157,832 | **0.1** | **0.01** | **0.19** |
|  |  | Lag 5 | 157,638 | 0.02 | -0.07 | 0.12 |
|  |  | Lag 6 | 157,442 | 0.07 | -0.02 | 0.16 |
|  | DBP | Lag 0 | 157,984 | -0.05 | -0.1 | 0.001 |
|  |  | Lag 1 | 157,984 | **-0.1** | **-0.15** | **-0.05** |
|  |  | Lag 2 | 157,984 | 0.01 | -0.04 | 0.06 |
|  |  | Lag 3 | 157,983 | 0.02 | -0.03 | 0.07 |
|  |  | Lag 4 | 157,832 | 0.04 | -0.01 | 0.09 |
|  |  | Lag 5 | 157,638 | 0.0006 | -0.05 | 0.05 |
|  |  | Lag 6 | 157,442 | **0.07** | **0.02** | **0.12** |
| NO2 | SBP | Lag 0 | 356,319 | **0.18** | **0.11** | **0.25** |
|  |  | Lag 1 | 356,319 | 0.07 | -0.0009 | 0.14 |
|  |  | Lag 2 | 356,319 | **0.17** | **0.1** | **0.24** |
|  |  | Lag 3 | 356,319 | **0.46** | **0.38** | **0.53** |
|  |  | Lag 4 | 354,962 | **0.46** | **0.39** | **0.54** |
|  |  | Lag 5 | 353,738 | **0.41** | **0.33** | **0.48** |
|  |  | Lag 6 | 352,490 | **0.42** | **0.35** | **0.49** |
|  | DBP | Lag 0 | 356,319 | **0.20** | **0.16** | **0.24** |
|  |  | Lag 1 | 356,319 | **0.15** | **0.12** | **0.19** |
|  |  | Lag 2 | 356,319 | **0.18** | **0.14** | **0.22** |
|  |  | Lag 3 | 356,319 | **0.31** | **0.27** | **0.35** |
|  |  | Lag 4 | 354,962 | **0.33** | **0.28** | **0.37** |
|  |  | Lag 5 | 353,738 | **0.34** | **0.30** | **0.38** |
|  |  | Lag 6 | 352,490 | **0.31** | **0.28** | **0.35** |
| a Models adjusted for age at visit, self-reported race/ethnicity, education, treatment arms, US Census region, day of the week, season, BMI, neighborhood SEP, pack-year of smoking, diabetes, temperature, dew point temperature, relative humidity, wind speed, and a random slope for age. Models for DBP additionally adjusted for barometric pressure.  b ****represents changes in SBP and DBP per interquartile range (IQR) change in single lag day 0-6 air pollutant exposure metrics.  SBP is systolic blood pressure; DBP is diastolic blood pressure; n is number of observations; PM is particulate matter; PM2.5 is PM < 2.5 m; PM2.5-10 is 2.5 m < PM < 10 m; PM10 is PM < 10 m; NO2 is nitrogen dioxide. | | | | | | |

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| **eTable 2**. Associations between an IQR change in lag 3-5 day air pollutant concentrations and blood pressure in the WHI in 1) adjusted modelsa and 2) adjusted models not controlling for calendar time. | | | | | | |
| **Model** | **Health outcome** | **Air pollutant** | **n** | **βb** | **95% CI** | |
| Adjusted models | SBP | PM2.5 | 157,983 | 0.01 | -0.10 | 0.11 |
|  | PM2.5-10 | 157,983 | 0.07 | -0.03 | 0.17 |
|  | PM10 | 356,319 | -0.04 | -0.10 | 0.03 |
|  | NO2 | 356,319 | **-0.21** | **-0.30** | **-0.13** |
| DBP | PM2.5 | 157,983 | **0.10** | **0.04** | **0.15** |
|  | PM2.5-10 | 157,983 | 0.03 | -0.03 | 0.08 |
|  | PM10 | 356,319 | 0.00 | -0.04 | 0.03 |
|  | NO2 | 356,319 | **0.13** | **0.09** | **0.18** |
| Adjusted models not controlling for calendar time | SBP | PM2.5 | 157,983 | **0.17** | **0.07** | **0.27** |
|  | PM2.5-10 | 157,983 | 0.08 | -0.03 | 0.18 |
|  | PM10 | 356,319 | **0.12** | **0.06** | **0.19** |
|  | NO2 | 356,319 | **0.60** | **0.52** | **0.69** |
| DBP | PM2.5 | 157,983 | **0.18** | **0.12** | **0.23** |
|  | PM2.5-10 | 157,983 | 0.03 | -0.03 | 0.09 |
|  | PM10 | 356,319 | **0.06** | **0.02** | **0.10** |
|  | NO2 | 356,319 | **0.43** | **0.39** | **0.48** |
| a Models adjusted for age at visit, self-reported race/ethnicity, education, treatment arms, US Census region, day of the week, season, BMI, neighborhood SEP, pack-year of smoking, diabetes, calendar time, temperature, dew point temperature, relative humidity, wind speed, and a random slope for age. Models for DBP additionally adjusted for barometric pressure.  b ****represents changes in SBP and DBP per interquartile range (IQR) change in lag 3-5 day air pollutant exposure metrics.  SBP is systolic blood pressure; DBP is diastolic blood pressure; n is number of observations; PM is particulate matter; PM2.5 is PM < 2.5 m; PM2.5-10 is 2.5 m < PM < 10 m; PM10 is PM < 10 m; NO2 is nitrogen dioxide. | | | | | | |

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| **eTable 3.** Associationsa between an IQR change in air pollutant concentration and blood pressure for single lag days 0-6 based on adjusted models (with control for calendar time). | | | | | | |
| **Air pollutant** | **Outcome** | **Lag day** | **N** | ** b** | **95% CI** | |
| PM2.5 | SBP | Lag 0 | 157,984 | **-0.192** | **-0.283** | **-0.102** |
|  |  | Lag 1 | 157,984 | **-0.209** | **-0.302** | **-0.117** |
|  |  | Lag 2 | 157,984 | **-0.109** | **-0.202** | **-0.016** |
|  |  | Lag 3 | 157,983 | 0.002 | -0.094 | 0.098 |
|  |  | Lag 4 | 157,832 | -0.012 | -0.111 | 0.086 |
|  |  | Lag 5 | 157,638 | 0.019 | -0.075 | 0.113 |
|  |  | Lag 6 | 157,442 | 0.003 | -0.090 | 0.096 |
|  | DBP | Lag 0 | 157,984 | -0.001 | -0.053 | 0.050 |
|  |  | Lag 1 | 157,984 | -0.038 | -0.090 | 0.015 |
|  |  | Lag 2 | 157,984 | 0.006 | -0.047 | 0.059 |
|  |  | Lag 3 | 157,983 | 0.052 | -0.003 | 0.106 |
|  |  | Lag 4 | 157,832 | **0.094** | **0.039** | **0.150** |
|  |  | Lag 5 | 157,638 | **0.078** | **0.024** | **0.131** |
|  |  | Lag 6 | 157,442 | **0.063** | **0.010** | **0.116** |
| PM10 | SBP | Lag 0 | 356,319 | **-0.221** | **-0.277** | **-0.165** |
|  |  | Lag 1 | 356,319 | **-0.263** | **-0.321** | **-0.205** |
|  |  | Lag 2 | 356,319 | **-0.115** | **-0.174** | **-0.055** |
|  |  | Lag 3 | 356,319 | -0.047 | -0.109 | 0.014 |
|  |  | Lag 4 | 354,962 | -0.018 | -0.081 | 0.044 |
|  |  | Lag 5 | 353,738 | -0.009 | -0.070 | 0.052 |
|  |  | Lag 6 | 352,490 | 0.035 | -0.024 | 0.094 |
|  | DBP | Lag 0 | 356,319 | **-0.052** | **-0.084** | **-0.020** |
|  |  | Lag 1 | 356,319 | **-0.098** | **-0.131** | **-0.065** |
|  |  | Lag 2 | 356,319 | **-0.047** | **-0.081** | **-0.013** |
|  |  | Lag 3 | 356,319 | -0.018 | -0.053 | 0.017 |
|  |  | Lag 4 | 354,962 | -0.002 | -0.038 | 0.034 |
|  |  | Lag 5 | 353,738 | 0.015 | -0.019 | 0.050 |
|  |  | Lag 6 | 352,490 | **0.059** | **0.025** | **0.092** |
| PM2.5-10 | SBP | Lag 0 | 157,984 | **-0.152** | **-0.239** | **-0.064** |
|  |  | Lag 1 | 157,984 | **-0.159** | **-0.247** | **-0.071** |
|  |  | Lag 2 | 157,984 | 0.042 | -0.047 | 0.131 |
|  |  | Lag 3 | 157,983 | 0.030 | -0.060 | 0.119 |
|  |  | Lag 4 | 157,832 | **0.092** | **0.000** | **0.184** |
|  |  | Lag 5 | 157,638 | 0.009 | -0.084 | 0.103 |
|  |  | Lag 6 | 157,442 | 0.054 | -0.037 | 0.144 |
|  | DBP | Lag 0 | 157,984 | **-0.052** | **-0.102** | **-0.003** |
|  |  | Lag 1 | 157,984 | **-0.103** | **-0.153** | **-0.053** |
|  |  | Lag 2 | 157,984 | 0.007 | -0.043 | 0.058 |
|  |  | Lag 3 | 157,983 | 0.021 | -0.030 | 0.072 |
|  |  | Lag 4 | 157,832 | 0.036 | -0.016 | 0.088 |
|  |  | Lag 5 | 157,638 | -0.007 | -0.060 | 0.047 |
|  |  | Lag 6 | 157,442 | **0.060** | **0.009** | **0.111** |
| NO2 | SBP | Lag 0 | 356,319 | **-0.251** | **-0.320** | **-0.182** |
|  |  | Lag 1 | 356,319 | **-0.379** | **-0.450** | **-0.309** |
|  |  | Lag 2 | 356,319 | **-0.316** | **-0.388** | **-0.244** |
|  |  | Lag 3 | 356,319 | **-0.163** | **-0.239** | **-0.087** |
|  |  | Lag 4 | 354,962 | **-0.178** | **-0.257** | **-0.099** |
|  |  | Lag 5 | 353,738 | **-0.139** | **-0.214** | **-0.065** |
|  |  | Lag 6 | 352,490 | -0.026 | -0.094 | 0.043 |
|  | DBP | Lag 0 | 356,319 | **0.040** | **0.001** | **0.079** |
|  |  | Lag 1 | 356,319 | -0.016 | -0.056 | 0.024 |
|  |  | Lag 2 | 356,319 | -0.004 | -0.045 | 0.037 |
|  |  | Lag 3 | 356,319 | **0.073** | **0.029** | **0.116** |
|  |  | Lag 4 | 354,962 | **0.086** | **0.041** | **0.130** |
|  |  | Lag 5 | 353,738 | **0.137** | **0.095** | **0.180** |
|  |  | Lag 6 | 352,490 | **0.151** | **0.112** | **0.190** |
| a Models adjusted for age at visit, self-reported race/ethnicity, education, treatment arms, US Census region, day of the week, season, BMI, neighborhood SEP, pack-year of smoking, diabetes, calendar time, temperature, dew point temperature, relative humidity, wind speed, and a random slope for age. Models for DBP additionally adjusted for barometric pressure.  b ****represents changes in SBP and DBP per interquartile range (IQR) change in single lag day 0-6 air pollutant exposure metrics.  SBP is systolic blood pressure; DBP is diastolic blood pressure; n is number of observations; PM is particulate matter; PM2.5 is PM < 2.5 m; PM2.5-10 is 2.5 m < PM < 10 m; PM10 is PM < 10 m; NO2 is nitrogen dioxide. | | | | | | |

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| **eTable 4**. Effect modificationa of lag 3-5 day air pollutant concentrations assessed using stratification by BMI, neighborhood SEP, diabetes, dietary sodium intake, combined fruit and vegetable consumption, long-term PM2.5, and US Census region. | | | | | | | | |
| **Health Outcome** | **Air pollutant** | **Effect modifier and strata** | | **n** | **β** | ***p*-value for interaction** | **95% CI** | |
| SBP | NO2 | Neighborhood SEP | Tertile 1 | 117,216 | 0.09 | 0.0002 | -0.07 | 0.24 |
|  |  |  | Tertile 2 | 119,039 | -0.25 |  | -0.40 | -0.10 |
|  |  |  | Tertile 3 | 120,064 | -0.37 |  | -0.51 | -0.23 |
|  |  | BMI | Low | 115,664 | -0.29 | 0.0076 | -0.44 | -0.15 |
|  |  |  | Medium | 125,413 | -0.27 |  | -0.41 | -0.13 |
|  |  |  | High | 115,242 | -0.16 |  | -0.31 | -0.01 |
|  |  | Diabetes | No | 331,189 | -0.23 | <0.0001 | -0.32 | -0.15 |
|  |  |  | Yes | 25,130 | 0.09 |  | -0.26 | 0.43 |
|  |  | Dietary sodium intake | Tertile 1 | 83,717 | -0.19 | 0.0015 | -0.37 | -0.01 |
|  |  |  | Tertile 2 | 84,043 | -0.52 |  | -0.69 | -0.35 |
|  |  |  | Tertile 3 | 84,246 | -0.50 |  | -0.67 | -0.32 |
|  |  | Combined fruit and vegetable consumption | Tertile 1 | 83,412 | -0.38 | 0.3699 | -0.55 | -0.20 |
|  |  |  | Tertile 2 | 84,599 | -0.42 |  | -0.60 | -0.25 |
|  |  |  | Tertile 3 | 83,995 | -0.50 |  | -0.67 | -0.32 |
|  |  | Long-term PM2.5 | Tertile 1 | 127,086 | -0.29 | <0.0001 | -0.45 | -0.12 |
|  |  |  | Tertile 2 | 124,550 | -0.37 |  | -0.53 | -0.21 |
|  |  |  | Tertile 3 | 104,683 | -0.11 |  | -0.26 | 0.04 |
|  |  | US Census region | Northeast | 87,948 | -0.31 | <0.0001 | -0.48 | -0.15 |
|  |  |  | Midwest | 80,665 | -0.37 |  | -0.55 | -0.18 |
|  |  |  | South | 91,116 | -0.15 |  | -0.37 | 0.07 |
|  |  |  | West | 96,590 | 0.10 |  | -0.04 | 0.25 |
| DBP | NO2 | Neighborhood SEP | Tertile 1 | 117,216 | 0.30 | 0.0022 | 0.21 | 0.38 |
|  |  |  | Tertile 2 | 119,039 | 0.10 |  | 0.02 | 0.19 |
|  |  |  | Tertile 3 | 120,064 | 0.06 |  | -0.02 | 0.14 |
|  |  | BMI | Low | 115,664 | 0.10 | 0.0017 | 0.01 | 0.18 |
|  |  |  | Medium | 125,413 | 0.14 |  | 0.06 | 0.22 |
|  |  |  | High | 115,242 | 0.24 |  | 0.15 | 0.32 |
|  |  | Diabetes | No | 331,189 | 0.12 | <0.0001 | 0.07 | 0.17 |
|  |  |  | Yes | 25,130 | 0.36 |  | 0.17 | 0.56 |
|  |  | Sodium intake | Tertile 1 | 83,717 | 0.32 | 0.0021 | 0.32 | 0.05 |
|  |  |  | Tertile 2 | 84,043 | 0.19 |  | 0.09 | 0.28 |
|  |  |  | Tertile 3 | 84,246 | 0.11 |  | 0.01 | 0.21 |
|  |  | Combined fruit and vegetable consumption | Tertile 1 | 83,412 | 0.19 | 0.1727 | 0.09 | 0.29 |
|  |  |  | Tertile 2 | 84,599 | 0.22 |  | 0.12 | 0.31 |
|  |  |  | Tertile 3 | 83,995 | 0.16 |  | 0.06 | 0.25 |
|  |  | Long-term PM2.5 | Tertile 1 | 127,086 | -0.01 |  | -0.10 | 0.09 |
|  |  |  | Tertile 2 | 124,550 | 0.22 |  | 0.13 | 0.31 |
|  |  |  | Tertile 3 | 104,683 | 0.22 |  | 0.14 | 0.31 |
|  |  | US Census region | Northeast | 87,948 | 0.09 | <0.0001 | 0.00 | 0.18 |
|  |  |  | Midwest | 80,665 | -0.04 |  | -0.15 | 0.07 |
|  |  |  | South | 91,116 | 0.02 |  | -0.10 | 0.14 |
|  |  |  | West | 96,590 | 0.34 |  | 0.26 | 0.42 |
|  | PM2.5b | Neighborhood SEP | Tertile 1 | 51,363 | 0.20 | 0.1349 | 0.10 | 0.31 |
|  |  |  | Tertile 2 | 53,303 | 0.04 |  | -0.06 | 0.14 |
|  |  |  | Tertile 3 | 53,317 | 0.05 |  | -0.04 | 0.15 |
|  |  | BMI | Low | 48,335 | 0.12 | 0.7551 | 0.01 | 0.22 |
|  |  |  | Medium | 56,066 | 0.07 |  | -0.02 | 0.17 |
|  |  |  | High | 53,582 | 0.13 |  | 0.03 | 0.23 |
|  |  | Diabetes | No | 144,732 | 0.09 | 0.4778 | 0.03 | 0.15 |
|  |  |  | Yes | 13,251 | 0.18 |  | -0.03 | 0.39 |
|  |  | Long-term PM2.5 | Tertile 1 | 37,398 | 0.09 | 0.7586 | -0.05 | 0.22 |
|  |  |  | Tertile 2 | 49,002 | 0.17 |  | 0.05 | 0.28 |
|  |  |  | Tertile 3 | 71,583 | -0.04 |  | -0.12 | 0.04 |
|  |  | US Census region | Northeast | 38,150 | -0.09 | 0.06 | -0.22 | 0.04 |
|  |  |  | Midwest | 36,020 | -0.06 |  | -0.19 | 0.07 |
|  |  |  | South | 39,000 | 0.28 |  | 0.15 | 0.42 |
|  |  |  | West | 44,813 | 0.12 |  | 0.02 | 0.21 |
| aModels included the main effect for each effect modifier (even if not identified as a confounder). Models adjusted for age, race/ethnicity, education, treatment arm, US Census region, day of the week, season, BMI, neighborhood SEP, pack-years of smoking, diabetes, calendar time, temperature, dew point temperature, barometric pressure, relative humidity, wind speed, and a random slope for age.  bEffect modification by sodium intake and fruit and vegetable consumption for the PM2.5-DBP associations was not analyzed due to missing PM2.5 data before 1999.  SBP is systolic blood pressure; DBP is diastolic blood pressure; n is number of observations; PM is particulate matter; PM2.5 is PM < 2.5 m; NO2 is nitrogen dioxide. | | | | | | | | |

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| **eTable 5.** Summary statistics on the distributions of lag 3-5 day PM2.5 and PM2.5-10 concentrations across levels of effect modifiers during the study period. | | | | | | | | | |
| **Effect modifier and strata** | |  | **Air pollutant** | | | | | | |
| **n** | **PM2.5** | | | **n** | **PM2.5-10** | | |
| **Mean** | **SD** | **IQR** | **Mean** | **SD** | **IQR** |
| Neighborhood SEP | Tertile 1 | 51,363 | 13.76 | 6.55 | 7.65 | 51,363 | 13.06 | 7.79 | 8.58 |
|  | Tertile 2 | 53,303 | 13.32 | 6.65 | 7.67 | 53,303 | 12.96 | 7.65 | 8.51 |
|  | Tertile 3 | 53,317 | 13.96 | 7.02 | 7.85 | 53,317 | 12.45 | 7.52 | 8.28 |
| BMI | Low | 48,335 | 13.78 | 6.83 | 7.78 | 48,335 | 12.79 | 7.74 | 8.52 |
|  | Medium | 56,066 | 13.63 | 6.72 | 7.73 | 56,066 | 12.82 | 7.64 | 8.41 |
|  | High | 53,582 | 13.64 | 6.71 | 7.71 | 53,582 | 12.84 | 7.60 | 8.47 |
| Diabetes | No | 144,732 | 13.68 | 6.76 | 7.74 | 144,732 | 12.82 | 7.67 | 8.48 |
|  | Yes | 13,251 | 13.67 | 6.61 | 7.70 | 13,251 | 12.85 | 7.59 | 8.28 |
| Sodium intake | Tertile 1 | 30,211 | 13.98 | 6.90 | 7.80 | 30,211 | 12.94 | 7.83 | 8.52 |
|  | Tertile 2 | 27,142 | 13.79 | 6.81 | 7.86 | 27,142 | 12.82 | 7.57 | 8.38 |
|  | Tertile 3 | 23,486 | 13.67 | 6.67 | 7.66 | 23,486 | 12.76 | 7.64 | 8.59 |
| Fruit and vegetable consumption | Tertile 1 | 25,868 | 13.93 | 6.86 | 7.85 | 25,868 | 12.95 | 7.87 | 8.68 |
|  | Tertile 2 | 26,387 | 13.76 | 6.79 | 7.74 | 26,387 | 12.76 | 7.67 | 8.40 |
|  | Tertile 3 | 28,584 | 13.78 | 6.76 | 7.75 | 28,584 | 12.83 | 7.53 | 8.40 |
| Long-term PM2.5 | Tertile 1 | 37,398 | 11.91 | 5.81 | 6.69 | 37,398 | 12.93 | 7.79 | 8.35 |
|  | Tertile 2 | 49,002 | 12.91 | 6.34 | 7.29 | 49,002 | 13.66 | 7.36 | 8.16 |
|  | Tertile 3 | 71,583 | 15.13 | 7.16 | 8.22 | 71,583 | 12.18 | 7.73 | 8.64 |
| US Census region | Northeast | 38,150 | 13.20 | 6.06 | 6.87 | 38,150 | 12.11 | 5.20 | 6.33 |
|  | Midwest | 36,020 | 13.84 | 6.25 | 7.72 | 36,020 | 13.39 | 7.92 | 9.70 |
|  | South | 39,000 | 14.33 | 6.03 | 7.13 | 39,000 | 12.20 | 6.15 | 7.24 |
|  | West | 44,813 | 13.39 | 8.10 | 8.66 | 44,813 | 13.50 | 9.95 | 11.18 |
| PM is particulate matter; PM2.5 is PM < 2.5 m; PM2.5-10 is 2.5 m < PM < 10 m; PM10 is PM < 10 m; NO2 is nitrogen dioxide; SD is standard deviation; IQR is interquartile range. | | | | | | | | | |

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| **eTable 6.** Summary statistics on the distributions of lag 3-5 day PM10 and NO2 concentrations across levels of effect modifiers during the study period. | | | | | | | | | | |
| **Effect modifier and strata** | |  | **Air pollutant** | | | | | | | |
| **n** | **PM10** | | | **n** | **NO2** | | | |
| **Mean** | **SD** | **IQR** | **Mean** | **SD** | **IQR** |
| Neighborhood SEP | Tertile 1 | 117,216 | 27.38 | 9.97 | 12.51 | 117,216 | 17.72 | 7.83 | 10.01 |
|  | Tertile 2 | 119,039 | 26.66 | 9.80 | 12.24 | 119,039 | 17.97 | 7.50 | 9.58 |
|  | Tertile 3 | 120,064 | 26.52 | 9.70 | 12.25 | 120,064 | 19.08 | 7.76 | 9.85 |
| BMI | Low | 115,664 | 26.92 | 9.87 | 12.47 | 115,664 | 18.45 | 7.72 | 9.78 |
|  | Medium | 125,413 | 26.82 | 9.81 | 12.32 | 125,413 | 18.24 | 7.74 | 9.94 |
|  | High | 115,242 | 26.81 | 9.81 | 12.24 | 115,242 | 18.11 | 7.70 | 9.89 |
| Diabetes | No | 331,189 | 26.85 | 9.83 | 12.35 | 331,189 | 18.29 | 7.71 | 9.86 |
|  | Yes | 25,130 | 26.86 | 9.82 | 12.23 | 25,130 | 17.97 | 7.80 | 10.07 |
| Sodium intake | Tertile 1 | 83,717 | 27.20 | 9.95 | 12.54 | 83,717 | 18.71 | 7.85 | 10.04 |
|  | Tertile 2 | 84,043 | 26.88 | 9.85 | 12.44 | 84,043 | 18.65 | 7.71 | 9.75 |
|  | Tertile 3 | 84,246 | 26.89 | 9.84 | 12.26 | 84,246 | 18.62 | 7.65 | 9.73 |
| Fruit and vegetable consumption | Tertile 1 | 83,412 | 27.17 | 9.95 | 12.50 | 83,412 | 18.62 | 7.79 | 9.95 |
|  | Tertile 2 | 84,599 | 26.89 | 9.86 | 12.35 | 84,599 | 18.72 | 7.70 | 9.77 |
|  | Tertile 3 | 83,995 | 26.92 | 9.83 | 12.36 | 83,995 | 18.64 | 7.73 | 9.80 |
| Long-term PM2.5 | Tertile 1 | 127,086 | 25.71 | 9.76 | 11.86 | 127,086 | 16.30 | 6.55 | 8.58 |
|  | Tertile 2 | 124,550 | 27.19 | 9.61 | 12.14 | 124,550 | 17.90 | 7.20 | 9.59 |
|  | Tertile 3 | 104,683 | 27.84 | 10.03 | 12.97 | 104,683 | 21.08 | 8.73 | 11.03 |
| US Census region | Northeast | 87,948 | 24.40 | 8.55 | 10.12 | 87,948 | 20.95 | 7.84 | 10.59 |
|  | Midwest | 80,665 | 28.17 | 9.85 | 12.39 | 80,665 | 17.45 | 6.78 | 9.48 |
|  | South | 91,116 | 27.65 | 8.88 | 11.56 | 91,116 | 15.42 | 6.10 | 8.38 |
|  | West | 96,590 | 27.22 | 11.26 | 14.54 | 96,590 | 19.19 | 8.65 | 10.23 |
| PM is particulate matter; PM2.5 is PM < 2.5 m; PM2.5-10 is 2.5 m < PM < 10 m; PM10 is PM < 10 m; NO2 is nitrogen dioxide; SD is standard deviation; IQR is interquartile range. | | | | | | | | | | |

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| **eTable 7.** Single- and two-pollutant adjusted modelsa of lag 3-5 day air pollutant concentrations. | | | | | | | |
| **Health outcome** | **Model** | **Air pollutant** | **Sample subset** | **n** | **** | **95% CI** | |
| DBP | Single-pollutant | PM2.5 | Non-missing PM2.5 | 157,983 | **0.10** | **0.04** | **0.15** |
|  |  | NO2 | Non-missing PM2.5 | 157,983 | **0.43** | **0.36** | **0.51** |
|  |  | NO2 | Non-missing NO2 | 356,319 | **0.13** | **0.09** | **0.18** |
| DBP | Two-pollutantb | PM2.5 | Non-missing PM2.5 | 157,983 | **-0.06** | **-0.13** | **0.00** |
|  |  | NO2 | Non-missing PM2.5 | 157,983 | **0.47** | **0.38** | **0.56** |
| aModels adjusted for age, race/ethnicity, education, treatment arm, US Census region, day of the week, season, BMI, neighborhood SEP, pack-years of smoking, diabetes, calendar time, temperature, dew point temperature, barometric pressure, relative humidity, wind speed, and a random slope for age.  bThe two-pollutant model included PM2.5 and NO2 in the same model. | | | | | | | |

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| **eTable 8.** Single- and two-pollutant models of lag 3-5 day air pollutant concentrations based on adjusted models stratified by US Census regiona. | | | | | | | |
| **US Census region** | **Outcome** | **Model** | **Air pollutant** | **Nb** | **** | **95% CI** | |
| Northeast | DBP | Single-pollutant | PM2.5 | 38,150 | -0.09 | -0.22 | 0.04 |
|  |  |  | NO2 | 38,150 | 0.04 | -0.11 | 0.19 |
|  |  | Two-pollutant | PM2.5 | 38,150 | -0.14 | -0.29 | 0.01 |
|  |  |  | NO2 | 38,150 | 0.12 | -0.05 | 0.29 |
| Midwest | DBP | Single-pollutant | PM2.5 | 36,020 | -0.06 | -0.19 | 0.07 |
|  |  |  | NO2 | 36,020 | -0.04 | -0.22 | 0.15 |
|  |  | Two-pollutant | PM2.5 | 36,020 | -0.06 | -0.20 | 0.09 |
|  |  |  | NO2 | 36,020 | 0.00 | -0.20 | 0.21 |
| South | DBP | Single-pollutant | PM2.5 | 39,000 | **0.28** | **0.15** | **0.42** |
|  |  |  | NO2 | 39,000 | **1.16** | **0.94** | **1.39** |
|  |  | Two-pollutant | PM2.5 | 39,000 | 0.08 | -0.06 | 0.22 |
|  |  |  | NO2 | 39,000 | **1.12** | **0.89** | **1.36** |
| West | DBP | Single-pollutant | PM2.5 | 44,813 | **0.12** | **0.02** | **0.21** |
|  |  |  | NO2 | 44,813 | **0.58** | **0.45** | **0.71** |
|  |  | Two-pollutant | PM2.5 | 44,813 | -0.11 | -0.21 | 0.00 |
|  |  |  | NO2 | 44,813 | **0.64** | **0.50** | **0.78** |
| a: In models with an interaction term between US Census region and NO2, rather than stratification, the *p*-value for the interaction term was <0.0001.  b: The sample size for analysis results in this table have been restricted to only observations with non-missing PM2.5 data in order to compare single-pollutant models and two-pollutant models. | | | | | | | |

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| **eTable 9**. Results from sensitivity analyses: Associationsa between an IQR change in lag 3-5 day air pollutant concentrations and blood pressure in the WHI after the addition of 10 mmHg among those with anti-hypertensive medication use to estimate non-treated blood pressure. | | | | | |
| **Health outcome** | **Air pollutant** | **n** | **βb** | **95% CI** | |
| SBP | PM2.5 | 157,983 | 0.01 | -0.09 | 0.12 |
|  | PM2.5-10 | 157,983 | 0.09 | -0.02 | 0.19 |
|  | PM10 | 356,319 | -0.04 | -0.11 | 0.03 |
|  | NO2 | 356,319 | **-0.22** | **-0.31** | **-0.14** |
| DBP | PM2.5 | 157,983 | **0.07** | **0.01** | **0.14** |
|  | PM2.5-10 | 157,983 | 0.03 | -0.03 | 0.10 |
|  | PM10 | 356,319 | -0.01 | -0.05 | 0.03 |
|  | NO2 | 356,319 | **0.11** | **0.06** | **0.16** |
| a Models adjusted for age at visit, self-reported race/ethnicity, education, treatment arms, US Census region, day of the week, season, BMI, neighborhood SEP, pack-year of smoking, diabetes, temperature, dew point temperature, relative humidity, wind speed, and a random slope for age. Models for DBP additionally adjusted for barometric pressure.  b ****represents changes in SBP and DBP per interquartile range (IQR) change in lag 3-5 day air pollutant exposure metrics.  SBP is systolic blood pressure; DBP is diastolic blood pressure; n is number of observations; PM is particulate matter; PM2.5 is PM < 2.5 m; PM2.5-10 is 2.5 m < PM < 10 m; PM10 is PM < 10 m; NO2 is nitrogen dioxide. | | | | | |

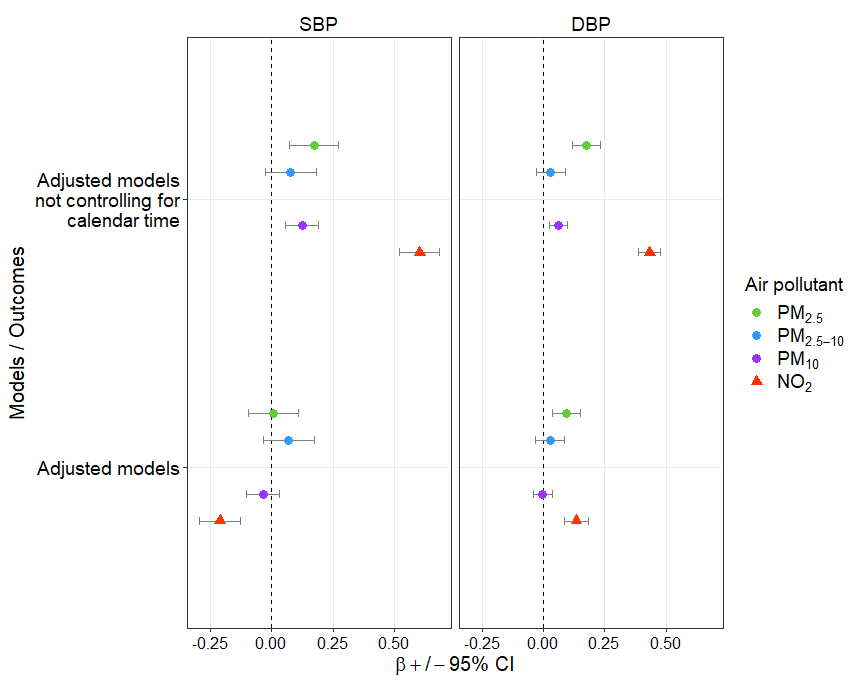
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| **eTable 10**. Results from sensitivity analyses: Associationsa between an IQR change in lag 3-5 day air pollutant concentrations and blood pressure in the WHI using additional degrees of freedom (df = 11) for seasonality. | | | | | |
| **Health outcome** | **Air pollutant** | **n** | **βb** | **95% CI** | |
| SBP | PM2.5 | 157,983 | 0.03 | -0.07 | 0.13 |
|  | PM2.5-10 | 157,983 | 0.06 | -0.05 | 0.16 |
|  | PM10 | 356,319 | -0.03 | -0.10 | 0.04 |
|  | NO2 | 356,319 | **-0.22** | **-0.31** | **-0.14** |
| DBP | PM2.5 | 157,983 | **0.10** | **0.05** | **0.16** |
|  | PM2.5-10 | 157,983 | 0.02 | -0.04 | 0.08 |
|  | PM10 | 356,319 | -0.01 | -0.04 | 0.03 |
|  | NO2 | 356,319 | **0.11** | **0.06** | **0.16** |
| a Models adjusted for age at visit, self-reported race/ethnicity, education, treatment arm, US Census region, day of the week, month, BMI, neighborhood SEP, pack-year of smoking, diabetes, temperature, dew point temperature, relative humidity, wind speed, and a random slope for age. Models for DBP additionally adjusted for barometric pressure.  b ****represents changes in SBP and DBP per interquartile range (IQR) change in lag 3-5 day air pollutant exposure metrics.  SBP is systolic blood pressure; DBP is diastolic blood pressure; n is number of observations; PM is particulate matter; PM2.5 is PM < 2.5 m; PM2.5-10 is 2.5 m < PM < 10 m; PM10 is PM < 10 m; NO2 is nitrogen dioxide. | | | | | |

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| **eTable 11.** Associationsa between an IQR change in long-term (annual) PM2.5 concentrations estimated from two different exposure models and blood pressure in the WHI**.** | | | | | | |
| **Health outcome** | **Air pollutant** | **Exposure model** | **n** | **βb** | **95% CI** | |
| SBP | Long-term PM2.5 | Kriging | 123,062 | **-0.19** | **-0.34** | **-0.03** |
|  | Long-term PM2.5 | GAMMs | 123,062 | **-0.38** | **-0.50** | **-0.25** |
| DBP | Long-term PM2.5 | Kriging | 123,062 | **0.34** | **0.26** | **0.43** |
|  | Long-term PM2.5 | GAMMs | 123,062 | **0.15** | **0.08** | **0.22** |
| a Models adjusted for age at visit, self-reported race/ethnicity, education, treatment arms, US Census region, day of the week, season, BMI, neighborhood SEP, pack-year of smoking, diabetes, calendar time, temperature, dew point temperature, relative humidity, wind speed, and a random slope for age. Models for DBP additionally adjusted for barometric pressure.  b ****represents changes in SBP and DBP per interquartile range (IQR) change in annual PM2.5 exposure metrics.  SBP is systolic blood pressure; DBP is diastolic blood pressure; n is number of observations; PM2.5 is particulate matter < 2.5 m; GAMMs: generalized additive mixed models. | | | | | | |

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| **eTable 12.** Results from sensitivity analyses: Associationsa between an IQR change in short-term (lag 3-5 day) and long-term (annual) PM2.5 in the same model and blood pressure in the WHI with long-term PM2.5 estimated from kriging models. | | | | | |
| **Health outcome** | **Air pollutant** | **n** | **βb** | **95% CI** | |
| SBP | Short-term PM2.5 | 123,062 | 0.00 | -0.13 | 0.12 |
|  | Long-term PM2.5c | 123,062 | **-0.18** | **-0.35** | **-0.02** |
| DBP | Short-term PM2.5 | 123,062 | 0.04 | -0.03 | 0.11 |
|  | Long-term PM2.5c | 123,062 | **0.32** | **0.23** | **0.41** |
| a Models adjusted for age at visit, self-reported race/ethnicity, education, treatment arms, US Census region, day of the week, season, BMI, neighborhood SEP, pack-year of smoking, diabetes, calendar time, temperature, dew point temperature, relative humidity, wind speed, and a random slope for age. Models for DBP additionally adjusted for barometric pressure.  b ****represents changes in SBP and DBP per interquartile range (IQR) change in short-term and long-term PM2.5 concentrations.  c Long-term PM2.5 estimated from kriging models. SBP is systolic blood pressure; DBP is diastolic blood pressure; n is number of observations; PM2.5 is particulate matter < 2.5 m. | | | | | |

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| **eTable 13.** Results from sensitivity analyses: Associationsa between an IQR change in lag 3-5 day air pollutant concentrations and blood pressure in the WHI after restriction to complete data on PM2.5. | | | | | |
| **Health outcome** | **Air pollutant** | **n** | **βb** | **95% CI** | |
| SBP | PM2.5 | 157,983 | 0.01 | -0.10 | 0.11 |
|  | PM2.5-10 | 157,983 | 0.07 | -0.03 | 0.17 |
|  | PM10 | 157,983 | 0.06 | -0.05 | 0.18 |
|  | NO2 | 157,983 | **-0.23** | **-0.37** | **-0.10** |
| DBP | PM2.5 | 157,983 | **0.10** | **0.04** | **0.15** |
|  | PM2.5-10 | 157,983 | 0.03 | -0.03 | 0.08 |
|  | PM10 | 157,983 | 0.10 | 0.04 | 0.17 |
|  | NO2 | 157,983 | **0.43** | **0.36** | **0.51** |
| a Models adjusted for age at visit, self-reported race/ethnicity, education, treatment arms, US Census region, day of the week, season, BMI, neighborhood SEP, pack-year of smoking, diabetes, calendar time, temperature, dew point temperature, relative humidity, wind speed, and a random slope for age. Models for DBP additionally adjusted for barometric pressure.  b ****represents changes in SBP and DBP per interquartile range (IQR) change in lag 3-5 day air pollutant exposure metrics.  SBP is systolic blood pressure; DBP is diastolic blood pressure; n is number of observations; PM is particulate matter; PM2.5 is PM < 2.5 m; PM2.5-10 is 2.5 m < PM < 10 m; PM10 is PM < 10 m; NO2 is nitrogen dioxide. | | | | | |

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| **eTable 14**. Results from sensitivity analyses: Associationsa between an IQR change in lag 3-5 day air pollutant concentrations and pulse pressure and mean arterial pressure in the WHI. | | | | | |
| **Health outcome** | **Air pollutant** | **n** | **βb** | **95% CI** | |
| PP | PM2.5 | 157,983 | **-0.10** | **-0.18** | **-0.02** |
|  | PM2.5-10 | 157,983 | 0.04 | -0.04 | 0.13 |
|  | PM10 | 356,319 | -0.04 | -0.1 | 0.01 |
|  | NO2 | 356,319 | **-0.40** | **-0.47** | **-0.33** |
| MAP | PM2.5 | 157,983 | 0.06 | -0.0005 | 0.13 |
|  | PM2.5-10 | 157,983 | 0.04 | -0.03 | 0.10 |
|  | PM10 | 356,319 | -0.02 | -0.06 | 0.03 |
|  | NO2 | 356,319 | 0.01 | -0.04 | 0.07 |
| a Models adjusted for age at visit, self-reported race/ethnicity, education, treatment arms, US Census region, day of the week, season, BMI, neighborhood SEP, pack-year of smoking, diabetes, calendar time, temperature, dew point temperature, relative humidity, wind speed, and a random slope for age.  b ****represents changes in PP per interquartile range (IQR) change in lag 3-5 day air pollutant exposure metrics.  PP is pulse pressure; MAP is mean arterial pressure; n is number of observations; PM is particulate matter; PM2.5 is PM < 2.5 m; PM2.5-10 is 2.5 m < PM < 10 m; PM10 is PM < 10 m; NO2 is nitrogen dioxide. | | | | | |



**eFigure 1.** Associations of an IQR change in lag 3-5 day air pollutant concentrations and systolic blood pressure (SBP) and diastolic blood pressure (DBP) in the WHI comparing adjusted models not controlling for calendar time (top row) and adjusted models with control for calendar time (bottom row; data from Table 2).