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Supplemental Material

Ambient Air Pollution and Cancer Mortality in the Cancer Prevention Study-II

Michelle C. Turner, Daniel Krewski, W. Ryan Diver, C. Arden Pope III, Richard T. Burnett, Michael Jerrett, Julian D. Marshall, Susan M. Gapstur

Table of Contents

Table S1. Correlations between air pollutants (n = 623,048).

Table S2. Distribution of additional participant characteristics at enrollment (1982) and air pollution concentrations, CPS-II cohort, US (n = 623,048).

Table S3. Adjusted HRs (95% CIs)^a for non-lung cancer mortality per each fifth percentile–mean increment in air pollutant concentrations, single-pollutant models with minimal adjustment, CPS-II cohort, US (1982-2004) (n = 623,048).

Table S4. Adjusted HRs (95% CIs)^a for non-lung cancer mortality per each fifth percentile–mean increment in air pollutant concentrations, single-pollutant models, sensitivity analysis adjusting for physical exercise, aspirin use, and red meat intake, CPS-II cohort, US (1982-2004) (n = 623,048).

Table S5. Adjusted HRs (95% CIs)^a for non-lung cancer mortality per each fifth percentile–mean increment in air pollutant concentrations, single-pollutant models, sensitivity analysis adjusting for age at menarche, parity, age at first birth, oral contraceptive use, menopausal status, and postmenopausal hormone use, females, CPS-II cohort, US (1982-2004) (n = 344,593).

Table S6. Adjusted HRs (95% CIs)^a for non-lung cancer mortality per each fifth percentile–mean increment in air pollutant concentrations, two-pollutant model, CPS-II cohort, US (1982-2004) (n = 623,048).

Table S7. Adjusted HRs (95% CIs)^a for non-lung cancer mortality per each fifth percentile–mean increment in air pollutant concentrations, multi-pollutant models, CPS-II cohort, US (1982-2004) (n = 623,048).

Table S8. Adjusted HRs (95% CIs)^a for non-lung cancer mortality per each fifth percentile–mean increment in decomposed LURBME PM_{2.5} concentrations, two-pollutant model, CPS-II cohort, US (1982-2004) (n = 623,048).

Table S9. Adjusted HRs (95% CIs)^a for non-lung cancer mortality per each fifth percentile–mean increment in air pollutant concentrations, stratified results according to selected risk factors, CPS-II cohort, US (1982-2004).

Table S1. Correlations between air pollutants (n = 623,048).

| | PM _{2.5} | NO ₂ | O ₃ | Near-source PM _{2.5} | Regional PM _{2.5} |
|-------------------------------|-------------------|-----------------|----------------|----------------------------------|----------------------------|
| PM _{2.5} | - | 0.40 | 0.17 | 0.27 | 0.94 |
| NO ₂ | - | - | -0.09 | 0.60 | 0.21 |
| O ₃ | - | - | - | -0.13 | 0.22 |
| Near-source PM _{2.5} | - | - | - | - | -0.06 |
| Regional PM _{2.5} | - | - | - | - | - |

Table 2. Distribution of additional participant characteristics at enrollment (1982) and air pollution concentrations, CPS-II cohort, US (n = 623,048).

| Characteristic | % | PM _{2.5} (µg/m ³) Mean (SD) | NO ₂ (ppb) Mean (SD) | O ₃ (ppb) Mean (SD) |
|--|------|---|------------------------------------|-----------------------------------|
| Exercise | | | | |
| None | 2.2 | 12.9 (2.8) | 13.2 (5.6) | 37.8 (4.0) |
| Slight | 24.5 | 12.7 (2.9) | 12.1 (5.2) | 38.1 (4.0) |
| Moderate | 64.6 | 12.5 (2.8) | 11.4 (5.0) | 38.2 (3.9) |
| Heavy | 7.5 | 12.5 (2.9) | 11.3 (5.1) | 38.2 (4.0) |
| Missing | 1.2 | 12.7 (2.8) | 11.8 (5.2) | 38.0 (3.9) |
| Aspirin Use Past Month | | | | |
| Yes | 26.0 | 12.5 (2.8) | 11.5 (5.0) | 38.1 (3.9) |
| No | 74.0 | 12.6 (2.9) | 11.7 (5.1) | 38.2 (4.0) |
| Red Meat Consumption | | | | |
| 1 st quintile | 16.6 | 12.7 (3.0) | 12.7 (5.5) | 37.9 (4.3) |
| 2 nd quintile | 19.5 | 12.6 (2.8) | 12.0 (5.2) | 38.0 (4.0) |
| 3 rd quintile | 21.2 | 12.5 (2.8) | 11.5 (5.0) | 38.0 (3.9) |
| 4 th quintile | 15.4 | 12.5 (2.8) | 11.1 (4.8) | 38.2 (3.8) |
| 5 th quintile | 19.1 | 12.5 (2.8) | 10.7 (4.6) | 38.4 (3.7) |
| Age at Menarche^a | | | | |
| <12 years | 17.7 | 12.6 (2.9) | 11.9 (5.2) | 38.1 (3.9) |
| 12-13 years | 53.0 | 12.6 (2.8) | 11.6 (5.1) | 38.1 (3.9) |
| 14+ years | 26.4 | 12.6 (2.9) | 11.6 (5.1) | 38.2 (4.0) |
| Missing | 2.9 | 12.7 (2.8) | 11.6 (5.0) | 38.3 (3.9) |
| Parity^a | | | | |
| 0 | 11.8 | 12.8 (2.9) | 12.2 (5.2) | 38.0 (4.0) |
| 1 | 10.8 | 12.8 (2.9) | 11.8 (5.1) | 38.3 (3.9) |
| 2 | 27.0 | 12.7 (2.9) | 11.8 (5.2) | 38.1 (3.9) |
| 3 | 22.8 | 12.5 (2.8) | 11.5 (5.1) | 38.1 (3.9) |
| 4+ | 24.3 | 12.4 (2.8) | 11.4 (5.0) | 38.2 (4.0) |
| Missing | 3.4 | 12.8 (2.8) | 12.1 (5.3) | 38.0 (3.9) |
| Age at First Birth^a | | | | |
| No birth | 11.8 | 12.8 (2.9) | 12.2 (5.2) | 38.0 (4.0) |
| <20 years | 9.8 | 12.6 (3.0) | 11.1 (4.9) | 38.7 (4.0) |
| 20-29 years | 64.6 | 12.6 (2.8) | 11.6 (5.1) | 38.1 (3.9) |
| 30+ years | 9.6 | 12.7 (2.9) | 12.1 (5.2) | 37.9 (4.0) |
| Missing | 4.3 | 12.8 (2.8) | 12.1 (5.2) | 38.0 (3.9) |
| Ever Oral Contraceptive Use^a | | | | |
| Yes | 28.3 | 12.5 (2.9) | 11.4 (5.0) | 38.1 (4.0) |
| No | 68.6 | 12.6 (2.8) | 11.8 (5.2) | 38.2 (3.9) |
| Missing | 3.0 | 12.8 (2.8) | 11.9 (5.2) | 38.2 (3.7) |
| Post-Menopausal Status^a | | | | |
| Yes | 69.9 | 12.6 (2.9) | 11.6 (5.0) | 38.2 (4.0) |
| No | 27.8 | 12.6 (2.8) | 11.8 (5.3) | 37.9 (3.9) |
| Missing | 2.3 | 12.7 (2.9) | 11.4 (4.9) | 38.5 (3.8) |
| Ever Postmenopausal Hormone Use^a | | | | |
| Yes | 33.6 | 12.5 (3.0) | 11.5 (4.9) | 38.5 (4.2) |
| No | 57.7 | 12.6 (2.8) | 11.7 (5.2) | 38.0 (3.8) |
| Missing | 8.7 | 12.8 (2.8) | 11.9 (5.2) | 38.0 (3.8) |
| Diabetes | | | | |
| Yes | 4.7 | 12.8 (2.8) | 11.8 (5.1) | 38.3 (3.9) |
| No | 95.3 | 12.6 (2.8) | 11.6 (5.1) | 38.1 (4.0) |

^aLimited to 344,593 women.

Table S3. Adjusted HRs (95% CIs)^a for non-lung cancer mortality per each fifth percentile–mean increment in air pollutant concentrations, single-pollutant models with minimal adjustment, CPS-II cohort, US (1982-2004) (n = 623,048).

| Cause of Death | ICD 9; 10 | No. of Deaths | PM _{2.5} | | NO ₂ | | O ₃ | |
|------------------------------|-----------------------|---------------|---------------------------|------------------|-----------------|------------------|----------------|------------------|
| | | | HR | 95% CI | HR | 95% CI | HR | 95% CI |
| | | | per 4.4 µg/m ³ | | per 6.5 ppb | | per 6.9 ppb | |
| Tongue and mouth | 141, 143-145; C01-C06 | 262 | 1.12 | 0.94-1.35 | 1.10 | 0.95-1.28 | 0.87 | 0.70-1.07 |
| Salivary gland | 142; C07-C08 | 58 | 1.11 | 0.75-1.64 | 1.23 | 0.91-1.67 | 1.22 | 0.80-1.87 |
| Pharynx | 146-149; C09-C14 | 243 | 0.95 | 0.78-1.16 | 0.89 | 0.75-1.06 | 1.06 | 0.86-1.32 |
| Esophagus | 150; C15 | 1,180 | 1.00 | 0.91-1.09 | 1.03 | 0.96-1.11 | 0.89 | 0.80-0.98 |
| Stomach | 151; C16 | 1,340 | 1.03 | 0.95-1.11 | 1.08 | 1.01-1.15 | 0.89 | 0.81-0.98 |
| Colorectal | 153-154; C18-C21 | 6,475 | 1.07 | 1.03-1.11 | 1.04 | 1.01-1.07 | 0.92 | 0.88-0.96 |
| Liver | 155; C22 | 1,003 | 1.07 | 0.97-1.17 | 1.05 | 0.97-1.13 | 0.97 | 0.87-1.08 |
| Gallbladder | 156; C23-C24 | 403 | 1.03 | 0.89-1.20 | 1.00 | 0.88-1.13 | 0.89 | 0.76-1.06 |
| Pancreas | 157; C25 | 3,812 | 1.00 | 0.96-1.06 | 1.05 | 1.01-1.10 | 0.90 | 0.85-0.95 |
| Nose | 160; C30-C31 | 46 | 0.55 | 0.34-0.90 | 0.75 | 0.49-1.14 | 1.10 | 0.68-1.79 |
| Larynx | 161; C32 | 223 | 1.14 | 0.93-1.39 | 1.15 | 0.98-1.35 | 0.94 | 0.75-1.18 |
| Bone | 170; C40-C41 | 81 | 0.92 | 0.65-1.29 | 0.98 | 0.74-1.30 | 1.03 | 0.71-1.50 |
| Connective tissue | 171; C47, C49 | 377 | 1.03 | 0.88-1.20 | 1.04 | 0.91-1.18 | 0.88 | 0.74-1.05 |
| Melanoma | 172; C43 | 862 | 1.02 | 0.92-1.13 | 1.03 | 0.95-1.13 | 0.97 | 0.86-1.09 |
| Other skin | 173; C44, C46 | 195 | 1.07 | 0.87-1.33 | 1.04 | 0.87-1.25 | 0.98 | 0.77-1.25 |
| Breast (female) ^b | 174-175; C50 | 3,844 | 1.08 | 1.02-1.13 | 1.05 | 1.01-1.09 | 0.98 | 0.92-1.03 |
| Uterus ^{b,c} | 179, 182; C54-C55 | 611 | 1.05 | 0.93-1.19 | 1.05 | 0.95-1.15 | 0.99 | 0.86-1.14 |
| Cervix ^{b,c} | 180; C53 | 115 | 1.35 | 1.03-1.78 | 1.04 | 0.83-1.30 | 1.02 | 0.74-1.41 |
| Ovary ^{b,c,d} | 183; C56 | 987 | 0.99 | 0.90-1.10 | 0.99 | 0.91-1.07 | 1.00 | 0.90-1.11 |
| Prostate ^b | 185; C61 | 1,068 | 0.96 | 0.87-1.05 | 0.98 | 0.91-1.06 | 0.99 | 0.90-1.10 |
| Bladder | 188; C67 | 1,324 | 1.13 | 1.04-1.22 | 1.08 | 1.01-1.15 | 0.95 | 0.86-1.04 |
| Kidney | 189; C64-C66, C68 | 927 | 1.09 | 0.99-1.20 | 0.99 | 0.91-1.08 | 0.96 | 0.86-1.07 |
| Eye | 190; C69 | 26 | 0.86 | 0.47-1.58 | 0.95 | 0.57-1.59 | 0.71 | 0.36-1.40 |
| Brain | 191; C71 | 1,591 | 1.01 | 0.94-1.09 | 0.97 | 0.91-1.03 | 0.97 | 0.89-1.05 |
| Thyroid | 193; C73 | 41 | 0.66 | 0.40-1.09 | 1.12 | 0.77-1.64 | 0.99 | 0.58-1.68 |
| Non-Hodgkin's lymphoma | 200,202; C82-C85 | 2,840 | 1.02 | 0.96-1.08 | 1.04 | 0.99-1.09 | 0.98 | 0.92-1.05 |
| Hodgkin's disease | 201; C81 | 125 | 1.10 | 0.84-1.43 | 1.09 | 0.88-1.36 | 0.98 | 0.72-1.32 |
| Multiple myeloma | 203; C88, C90 | 1,421 | 0.97 | 0.89-1.05 | 0.98 | 0.92-1.05 | 1.01 | 0.92-1.11 |
| Leukemia | 204-208; C91-C95 | 2,584 | 1.02 | 0.97-1.09 | 1.02 | 0.97-1.07 | 0.94 | 0.88-1.01 |

^a Age, race/ethnicity, gender, stratified.

^b As above but not gender stratified. Analysis limited to 344,593 women for analysis of breast cancer mortality, 235,637 women for analysis of uterine or cervical cancer mortality, and 228,494 women for analysis of ovarian cancer mortality. Analysis limited to 278,455 men for analysis of prostate cancer mortality.

^c Women reporting a previous hysterectomy or an artificial menopause excluded here (n = 108,956).

^d Women reporting having undergone an ovarian surgery also excluded here (n = 7,143).

Table S4. Adjusted HRs (95% CIs)^a for non-lung cancer mortality per each fifth percentile–mean increment in air pollutant concentrations, single-pollutant models, sensitivity analysis adjusting for physical exercise, aspirin use, and red meat intake, CPS-II cohort, US (1982-2004) (n = 623,048).

| Cause of Death | ICD 9; 10 | No. of Deaths | PM _{2.5} | | NO ₂ | | O ₃ | |
|------------------------------|-----------------------|---------------|---------------------------|------------------|-----------------|------------------|----------------|------------------|
| | | | HR | 95% CI | HR | 95% CI | HR | 95% CI |
| | | | per 4.4 µg/m ³ | | per 6.5 ppb | | per 6.9 ppb | |
| Tongue and mouth | 141, 143-145; C01-C06 | 262 | 1.03 | 0.84-1.26 | 0.97 | 0.79-1.17 | 0.93 | 0.73-1.17 |
| Salivary gland | 142; C07-C08 | 58 | 0.93 | 0.60-1.43 | 1.00 | 0.67-1.49 | 1.44 | 0.90-2.29 |
| Pharynx | 146-149; C09-C14 | 243 | 0.88 | 0.70-1.10 | 0.86 | 0.68-1.07 | 1.11 | 0.86-1.42 |
| Esophagus | 150; C15 | 1,180 | 1.02 | 0.92-1.12 | 1.01 | 0.92-1.11 | 0.97 | 0.86-1.08 |
| Stomach | 151; C16 | 1,340 | 1.00 | 0.91-1.09 | 1.05 | 0.96-1.14 | 0.90 | 0.81-0.99 |
| Colorectal | 153-154; C18-C21 | 6,475 | 1.04 | 1.00-1.08 | 1.06 | 1.01-1.10 | 0.95 | 0.90-0.99 |
| Liver | 155; C22 | 1,003 | 1.04 | 0.93-1.15 | 1.05 | 0.94-1.16 | 0.97 | 0.86-1.09 |
| Gallbladder | 156; C23-C24 | 403 | 1.03 | 0.87-1.22 | 1.00 | 0.85-1.17 | 0.95 | 0.78-1.14 |
| Pancreas | 157; C25 | 3,812 | 0.98 | 0.92-1.03 | 1.04 | 0.98-1.09 | 0.91 | 0.85-0.97 |
| Nose | 160; C30-C31 | 46 | 0.65 | 0.37-1.16 | 0.83 | 0.47-1.42 | 1.19 | 0.69-2.05 |
| Larynx | 161; C32 | 223 | 1.04 | 0.83-1.30 | 1.06 | 0.85-1.31 | 0.96 | 0.73-1.24 |
| Bone | 170; C40-C41 | 81 | 0.81 | 0.54-1.18 | 0.96 | 0.67-1.37 | 0.94 | 0.61-1.41 |
| Connective tissue | 171; C47, C49 | 377 | 1.06 | 0.89-1.25 | 1.04 | 0.88-1.23 | 0.89 | 0.73-1.07 |
| Melanoma | 172; C43 | 862 | 1.05 | 0.93-1.17 | 0.97 | 0.86-1.08 | 1.02 | 0.89-1.15 |
| Other skin | 173; C44, C46 | 195 | 1.10 | 0.88-1.38 | 0.89 | 0.70-1.13 | 0.97 | 0.75-1.25 |
| Breast (female) ^b | 174-175; C50 | 3,844 | 1.02 | 0.97-1.08 | 1.03 | 0.97-1.08 | 0.99 | 0.92-1.05 |
| Uterus ^{b,c} | 179, 182; C54-C55 | 611 | 1.04 | 0.90-1.19 | 1.07 | 0.93-1.21 | 0.98 | 0.84-1.14 |
| Cervix ^{b,c} | 180; C53 | 115 | 1.35 | 0.98-1.83 | 1.25 | 0.92-1.69 | 1.00 | 0.68-1.47 |
| Ovary ^{b,c,d} | 183; C56 | 987 | 1.03 | 0.92-1.15 | 1.03 | 0.92-1.13 | 1.01 | 0.89-1.14 |
| Prostate ^b | 185; C61 | 1,068 | 0.96 | 0.86-1.06 | 1.01 | 0.91-1.11 | 1.03 | 0.92-1.15 |
| Bladder | 188; C67 | 1,324 | 1.13 | 1.03-1.23 | 1.02 | 0.93-1.11 | 1.03 | 0.92-1.13 |
| Kidney | 189; C64-C66, C68 | 927 | 1.14 | 1.02-1.27 | 0.99 | 0.88-1.09 | 0.97 | 0.85-1.09 |
| Eye | 190; C69 | 26 | 1.28 | 0.65-2.49 | 1.15 | 0.57-2.30 | 0.76 | 0.38-1.53 |
| Brain | 191; C71 | 1,591 | 1.04 | 0.95-1.13 | 0.99 | 0.91-1.07 | 0.98 | 0.89-1.07 |
| Thyroid | 193; C73 | 41 | 0.61 | 0.34-1.11 | 1.19 | 0.72-1.97 | 0.96 | 0.54-1.71 |
| Non-Hodgkin's lymphoma | 200,202; C82-C85 | 2,840 | 1.00 | 0.94-1.06 | 1.05 | 0.98-1.11 | 0.98 | 0.91-1.05 |
| Hodgkin's disease | 201; C81 | 125 | 1.13 | 0.82-1.54 | 1.15 | 0.86-1.51 | 1.08 | 0.76-1.53 |
| Multiple myeloma | 203; C88, C90 | 1,421 | 0.97 | 0.89-1.06 | 1.00 | 0.91-1.09 | 0.99 | 0.89-1.09 |

| | | | | | | | | |
|----------|------------------|-------|------|-----------|------|-----------|-------------|------------------|
| Leukemia | 204-208; C91-C95 | 2,584 | 1.01 | 0.94-1.07 | 1.00 | 0.94-1.07 | 0.92 | 0.85-0.98 |
|----------|------------------|-------|------|-----------|------|-----------|-------------|------------------|

^a Age, race/ethnicity, gender stratified, and adjusted for baseline values of education, marital status, body mass index, body mass index squared, smoking status, cigarettes per day, cigarettes per day squared, duration of smoking, duration of smoking squared, age started smoking, passive smoking, vegetable/fruit/fiber consumption, fat consumption, beer, wine, liquor consumption, industrial exposures, occupation dirtiness index, and 1990 ecological covariates.

^b As above but not gender stratified. Analysis limited to 344,593 women for analysis of breast cancer mortality, 235,637 women for analysis of uterine or cervical cancer mortality, and 228,494 women for analysis of ovarian cancer mortality. Analysis limited to 278,455 men for analysis of prostate cancer mortality.

^c Women reporting a previous hysterectomy or an artificial menopause excluded here (n = 108,956).

^d Women reporting having undergone an ovarian surgery also excluded here (n = 7,143).

Table S5. Adjusted HRs (95% CIs)^a for non-lung cancer mortality per each fifth percentile–mean increment in air pollutant concentrations, single-pollutant models, sensitivity analysis adjusting for age at menarche, parity, age at first birth, oral contraceptive use, menopausal status, and postmenopausal hormone use, females, CPS-II cohort, US (1982-2004) (n = 344,593).

| Cause of Death | ICD 9; 10 | No. of Deaths | PM _{2.5} | | NO ₂ | | O ₃ | |
|----------------------|-------------------|---------------|-------------------|-----------|-----------------|-----------|----------------|-----------|
| | | | HR | 95% CI | HR | 95% CI | HR | 95% CI |
| Breast (female) | 174-175; C50 | 3,844 | 1.02 | 0.97-1.08 | 1.02 | 0.97-1.07 | 1.00 | 0.94-1.06 |
| Uterus ^b | 179, 182; C54-C55 | 611 | 1.03 | 0.90-1.18 | 1.06 | 0.94-1.21 | 0.98 | 0.84-1.14 |
| Cervix ^b | 180; C53 | 115 | 1.34 | 0.98-1.83 | 1.24 | 0.92-1.68 | 1.01 | 0.69-1.48 |
| Ovary ^{b,c} | 183; C56 | 987 | 1.03 | 0.92-1.15 | 1.02 | 0.92-1.13 | 1.01 | 0.90-1.14 |

^a Age and race/ethnicity stratified, and adjusted for baseline values of education, marital status, body mass index, body mass index squared, smoking status, cigarettes per day, cigarettes per day squared, duration of smoking, duration of smoking squared, age started smoking, passive smoking, vegetable/fruit/fiber consumption, fat consumption, beer, wine, liquor consumption, industrial exposures, occupation dirtiness index, age at menarche, parity, age at first birth, oral contraceptive use, menopausal status, and postmenopausal hormone use, and 1990 ecological covariates.

^b Women reporting a previous hysterectomy or an artificial menopause excluded here (n = 108,956).

^c Women reporting having undergone an ovarian surgery also excluded here (n = 7,143).

Table S6. Adjusted HRs (95% CIs)^a for non-lung cancer mortality per each fifth percentile–mean increment in air pollutant concentrations, two-pollutant model, CPS-II cohort, US (1982-2004) (n = 623,048).

| Cause of Death | ICD 9; 10 | No. of Deaths | PM _{2.5} | | NO ₂ | |
|------------------------------|-----------------------|---------------|---------------------------|------------------|-----------------|------------------|
| | | | HR | 95% CI | HR | 95% CI |
| | | | per 4.4 µg/m ³ | | per 6.5 ppb | |
| Tongue and mouth | 141, 143-145; C01-C06 | 262 | 1.05 | 0.84-1.31 | 0.96 | 0.77-1.19 |
| Salivary gland | 142; C07-C08 | 58 | 0.93 | 0.58-1.48 | 1.02 | 0.67-1.58 |
| Pharynx | 146-149; C09-C14 | 243 | 0.92 | 0.72-1.18 | 0.89 | 0.70-1.14 |
| Esophagus | 150; C15 | 1,180 | 1.02 | 0.92-1.14 | 1.01 | 0.91-1.12 |
| Stomach | 151; C16 | 1,340 | 0.97 | 0.88-1.07 | 1.06 | 0.97-1.17 |
| Colorectal | 153-154; C18-C21 | 6,475 | 1.02 | 0.97-1.06 | 1.05 | 1.01-1.10 |
| Liver | 155; C22 | 1,003 | 1.04 | 0.93-1.17 | 1.01 | 0.91-1.13 |
| Gallbladder | 156; C23-C24 | 403 | 1.04 | 0.87-1.25 | 0.99 | 0.83-1.18 |
| Pancreas | 157; C25 | 3,812 | 0.95 | 0.90-1.01 | 1.06 | 1.00-1.12 |
| Nose | 160; C30-C31 | 46 | 0.66 | 0.36-1.24 | 0.96 | 0.53-1.75 |
| Larynx | 161; C32 | 223 | 1.02 | 0.80-1.29 | 1.06 | 0.84-1.34 |
| Bone | 170; C40-C41 | 81 | 0.80 | 0.52-1.21 | 1.05 | 0.72-1.54 |
| Connective tissue | 171; C47, C49 | 377 | 1.05 | 0.87-1.27 | 1.02 | 0.85-1.22 |
| Melanoma | 172; C43 | 862 | 1.08 | 0.95-1.22 | 0.94 | 0.83-1.06 |
| Other skin | 173; C44, C46 | 195 | 1.19 | 0.93-1.54 | 0.84 | 0.64-1.08 |
| Breast (female) ^b | 174-175; C50 | 3,844 | 1.02 | 0.96-1.08 | 1.02 | 0.96-1.08 |
| Uterus ^{b,c} | 179, 182; C54-C55 | 611 | 1.01 | 0.87-1.17 | 1.06 | 0.92-1.23 |
| Cervix ^{b,c} | 180; C53 | 115 | 1.28 | 0.91-1.80 | 1.11 | 0.80-1.56 |
| Ovary ^{b,c,d} | 183; C56 | 987 | 1.02 | 0.91-1.15 | 1.02 | 0.91-1.14 |
| Prostate ^b | 185; C61 | 1,068 | 0.94 | 0.84-1.06 | 1.04 | 0.93-1.16 |
| Bladder | 188; C67 | 1,324 | 1.14 | 1.04-1.26 | 0.97 | 0.88-1.07 |
| Kidney | 189; C64-C66, C68 | 927 | 1.19 | 1.05-1.34 | 0.92 | 0.82-1.04 |
| Eye | 190; C69 | 26 | 1.28 | 0.61-2.67 | 1.03 | 0.48-2.20 |
| Brain | 191; C71 | 1,591 | 1.05 | 0.96-1.16 | 0.97 | 0.89-1.07 |
| Thyroid | 193; C73 | 41 | 0.52 | 0.28-0.97 | 1.56 | 0.92-2.65 |
| Non-Hodgkin's lymphoma | 200,202; C82-C85 | 2,840 | 0.98 | 0.91-1.05 | 1.06 | 0.99-1.13 |
| Hodgkin's disease | 201; C81 | 125 | 1.07 | 0.76-1.49 | 1.13 | 0.84-1.54 |
| Multiple myeloma | 203; C88, C90 | 1,421 | 0.97 | 0.88-1.07 | 1.02 | 0.93-1.12 |

| | | | | | | |
|----------|------------------|-------|------|-----------|------|-----------|
| Leukemia | 204-208; C91-C95 | 2,584 | 1.01 | 0.94-1.08 | 1.00 | 0.93-1.08 |
|----------|------------------|-------|------|-----------|------|-----------|

^a Age, race/ethnicity, gender stratified, and adjusted for baseline values of education, marital status, body mass index, body mass index squared, smoking status, cigarettes per day, cigarettes per day squared, duration of smoking, duration of smoking squared, age started smoking, passive smoking, vegetable/fruit/fiber consumption, fat consumption, beer, wine, liquor consumption, industrial exposures, occupation dirtiness index, and 1990 ecological covariates.

^b As above but not gender stratified. Analysis limited to 344,593 women for analysis of breast cancer mortality, 235,637 women for analysis of uterine or cervical cancer mortality, and 228,494 women for analysis of ovarian cancer mortality. Analysis limited to 278,455 men for analysis of prostate cancer mortality.

^c Women reporting a previous hysterectomy or an artificial menopause excluded here (n = 108,956).

^d Women reporting having undergone an ovarian surgery also excluded here (n = 7,143).

Table S7. Adjusted HRs (95% CIs)^a for non-lung cancer mortality per each fifth percentile–mean increment in air pollutant concentrations, multi-pollutant models, CPS-II cohort, US (1982-2004) (n = 623,048).

| Cause of Death | ICD 9; 10 | No. of Deaths | PM _{2.5} | | NO ₂ | | O ₃ | |
|------------------------------|-----------------------|---------------|---------------------------|------------------|-----------------|-----------|----------------|------------------|
| | | | HR | 95% CI | HR | 95% CI | HR | 95% CI |
| | | | per 4.4 µg/m ³ | | per 6.5 ppb | | per 6.9 ppb | |
| Tongue and mouth | 141, 143-145; C01-C06 | 262 | 1.08 | 0.85-1.37 | 0.94 | 0.76-1.17 | 0.91 | 0.71-1.16 |
| Salivary gland | 142; C07-C08 | 58 | 0.82 | 0.51-1.32 | 1.10 | 0.71-1.69 | 1.52 | 0.94-2.46 |
| Pharynx | 146-149; C09-C14 | 243 | 0.89 | 0.69-1.15 | 0.91 | 0.71-1.16 | 1.14 | 0.88-1.47 |
| Esophagus | 150; C15 | 1,180 | 1.03 | 0.92-1.15 | 1.00 | 0.90-1.11 | 0.96 | 0.86-1.08 |
| Stomach | 151; C16 | 1,340 | 1.00 | 0.90-1.11 | 1.05 | 0.95-1.15 | 0.90 | 0.81-1.00 |
| Colorectal | 153-154; C18-C21 | 6,475 | 1.03 | 0.98-1.08 | 1.04 | 1.00-1.09 | 0.94 | 0.90-0.99 |
| Liver | 155; C22 | 1,003 | 1.05 | 0.93-1.19 | 1.01 | 0.90-1.13 | 0.97 | 0.86-1.09 |
| Gallbladder | 156; C23-C24 | 403 | 1.06 | 0.87-1.28 | 0.98 | 0.82-1.17 | 0.93 | 0.77-1.13 |
| Pancreas | 157; C25 | 3,812 | 0.97 | 0.92-1.04 | 1.05 | 0.99-1.11 | 0.92 | 0.86-0.98 |
| Nose | 160; C30-C31 | 46 | 0.62 | 0.33-1.17 | 0.96 | 0.53-1.76 | 1.32 | 0.76-2.29 |
| Larynx | 161; C32 | 223 | 1.03 | 0.80-1.33 | 1.06 | 0.83-1.34 | 0.95 | 0.73-1.25 |
| Bone | 170; C40-C41 | 81 | 0.80 | 0.52-1.22 | 1.05 | 0.72-1.54 | 1.00 | 0.65-1.52 |
| Connective tissue | 171; C47, C49 | 377 | 1.09 | 0.90-1.33 | 1.00 | 0.83-1.20 | 0.87 | 0.71-1.06 |
| Melanoma | 172; C43 | 862 | 1.08 | 0.95-1.23 | 0.94 | 0.83-1.06 | 1.00 | 0.88-1.14 |
| Other skin | 173; C44, C46 | 195 | 1.23 | 0.94-1.61 | 0.83 | 0.64-1.07 | 0.91 | 0.70-1.19 |
| Breast (female) ^b | 174-175; C50 | 3,844 | 1.02 | 0.96-1.09 | 1.02 | 0.96-1.08 | 0.98 | 0.92-1.05 |
| Uterus ^{b,c} | 179, 182; C54-C55 | 611 | 1.02 | 0.87-1.19 | 1.06 | 0.92-1.22 | 0.98 | 0.83-1.15 |
| Cervix ^{b,c} | 180; C53 | 115 | 1.30 | 0.91-1.86 | 1.10 | 0.78-1.56 | 0.95 | 0.63-1.42 |
| Ovary ^{b,c,d} | 183; C56 | 987 | 1.02 | 0.90-1.16 | 1.02 | 0.91-1.14 | 1.01 | 0.89-1.14 |
| Prostate ^b | 185; C61 | 1,068 | 0.93 | 0.83-1.05 | 1.04 | 0.93-1.16 | 1.05 | 0.94-1.18 |
| Bladder | 188; C67 | 1,324 | 1.15 | 1.03-1.27 | 0.97 | 0.88-1.07 | 0.99 | 0.89-1.10 |
| Kidney | 189; C64-C66, C68 | 927 | 1.22 | 1.07-1.38 | 0.91 | 0.81-1.03 | 0.92 | 0.81-1.04 |
| Eye | 190; C69 | 26 | 1.46 | 0.66-3.25 | 0.97 | 0.45-2.10 | 0.68 | 0.32-1.44 |
| Brain | 191; C71 | 1,591 | 1.06 | 0.97-1.17 | 0.97 | 0.89-1.06 | 0.96 | 0.87-1.06 |
| Thyroid | 193; C73 | 41 | 0.51 | 0.27-0.96 | 1.57 | 0.92-2.67 | 1.09 | 0.61-1.92 |
| Non-Hodgkin's lymphoma | 200,202; C82-C85 | 2,840 | 0.98 | 0.91-1.05 | 1.06 | 0.99-1.13 | 0.99 | 0.92-1.06 |
| Hodgkin's disease | 201; C81 | 125 | 1.05 | 0.74-1.48 | 1.15 | 0.84-1.56 | 1.09 | 0.76-1.55 |
| Multiple myeloma | 203; C88, C90 | 1,421 | 0.97 | 0.88-1.07 | 1.02 | 0.92-1.12 | 1.00 | 0.90-1.10 |
| Leukemia | 204-208; C91-C95 | 2,584 | 1.03 | 0.96-1.11 | 0.99 | 0.92-1.06 | 0.91 | 0.85-0.98 |

^a Age, race/ethnicity, gender stratified, and adjusted for baseline values of education, marital status, body mass index, body mass index squared, smoking status, cigarettes per day, cigarettes per day squared, duration of smoking, duration of smoking squared, age started smoking, passive smoking, vegetable/fruit/fiber consumption, fat consumption, beer, wine, liquor consumption, industrial exposures, occupation dirtiness index, and 1990 ecological covariates.

^b As above but not gender stratified. Analysis limited to 344,593 women for analysis of breast cancer mortality, 235,637 women for analysis of uterine or cervical cancer mortality, and 228,494 women for analysis of ovarian cancer mortality. Analysis limited to 278,455 men for analysis of prostate cancer mortality.

^c Women reporting a previous hysterectomy or an artificial menopause excluded here (n = 108,956).

^d Women reporting having undergone an ovarian surgery also excluded here (n = 7,143).

Table S8. Adjusted HRs (95% CIs)^a for non-lung cancer mortality per each fifth percentile–mean increment in decomposed LURBME PM_{2.5} concentrations, two-pollutant model, CPS-II cohort, US (1982-2004) (n = 623,048).

| Cause of Death | ICD 9; 10 | No. of Deaths | Near-source PM _{2.5} | | Regional PM _{2.5} | |
|------------------------------|-----------------------|---------------|-------------------------------|------------------|----------------------------|------------------|
| | | | HR | 95% CI | HR | 95% CI |
| | | | per 1.6 µg/m ³ | | per 4.5 µg/m ³ | |
| Tongue and mouth | 141, 143-145; C01-C06 | 262 | 1.07 | 0.85-1.35 | 1.01 | 0.82-1.26 |
| Salivary gland | 142; C07-C08 | 58 | 0.79 | 0.51-1.25 | 0.99 | 0.63-1.56 |
| Pharynx | 146-149; C09-C14 | 243 | 0.94 | 0.74-1.19 | 0.88 | 0.69-1.12 |
| Esophagus | 150; C15 | 1,180 | 0.98 | 0.88-1.10 | 1.03 | 0.93-1.15 |
| Stomach | 151; C16 | 1,340 | 1.13 | 1.02-1.26 | 0.97 | 0.88-1.06 |
| Colorectal | 153-154; C18-C21 | 6,475 | 1.09 | 1.04-1.15 | 1.02 | 0.97-1.07 |
| Liver | 155; C22 | 1,003 | 1.08 | 0.96-1.22 | 1.03 | 0.92-1.15 |
| Gallbladder | 156; C23-C24 | 403 | 1.18 | 0.97-1.43 | 0.99 | 0.83-1.19 |
| Pancreas | 157; C25 | 3,812 | 1.06 | 1.00-1.13 | 0.96 | 0.90-1.01 |
| Nose | 160; C30-C31 | 46 | 0.74 | 0.44-1.27 | 0.68 | 0.37-1.24 |
| Larynx | 161; C32 | 223 | 1.12 | 0.87-1.44 | 1.02 | 0.80-1.28 |
| Bone | 170; C40-C41 | 81 | 0.81 | 0.53-1.22 | 0.85 | 0.56-1.28 |
| Connective tissue | 171; C47, C49 | 377 | 1.14 | 0.94-1.39 | 1.03 | 0.86-1.24 |
| Melanoma | 172; C43 | 862 | 0.95 | 0.84-1.08 | 1.07 | 0.95-1.21 |
| Other skin | 173; C44, C46 | 195 | 1.26 | 0.96-1.65 | 1.05 | 0.83-1.34 |
| Breast (female) ^b | 174-175; C50 | 3,844 | 1.01 | 0.95-1.07 | 1.03 | 0.97-1.09 |
| Uterus ^{b,c} | 179, 182; C54-C55 | 611 | 1.05 | 0.89-1.22 | 1.03 | 0.89-1.19 |
| Cervix ^{b,c} | 180; C53 | 115 | 1.27 | 0.87-1.85 | 1.30 | 0.94-1.82 |
| Ovary ^{b,c,d} | 183; C56 | 987 | 0.99 | 0.87-1.11 | 1.04 | 0.93-1.17 |
| Prostate ^b | 185; C61 | 1,068 | 1.00 | 0.89-1.12 | 0.95 | 0.85-1.07 |
| Bladder | 188; C67 | 1,324 | 1.02 | 0.92-1.13 | 1.14 | 1.04-1.25 |
| Kidney | 189; C64-C66, C68 | 927 | 1.05 | 0.92-1.18 | 1.15 | 1.02-1.29 |
| Eye | 190; C69 | 26 | 1.64 | 0.75-3.59 | 1.19 | 0.59-2.42 |
| Brain | 191; C71 | 1,591 | 1.03 | 0.94-1.13 | 1.04 | 0.95-1.14 |
| Thyroid | 193; C73 | 41 | 0.95 | 0.51-1.76 | 0.60 | 0.32-1.12 |
| Non-Hodgkin's lymphoma | 200,202; C82-C85 | 2,840 | 1.06 | 0.99-1.14 | 0.99 | 0.92-1.06 |
| Hodgkin's disease | 201; C81 | 125 | 1.32 | 0.92-1.88 | 1.05 | 0.75-1.47 |

| | | | | | | |
|------------------|------------------|-------|------|-----------|------|-----------|
| Multiple myeloma | 203; C88, C90 | 1,421 | 1.01 | 0.92-1.12 | 0.97 | 0.88-1.06 |
| Leukemia | 204-208; C91-C95 | 2,584 | 1.06 | 0.98-1.14 | 0.99 | 0.93-1.06 |

^a Age, race/ethnicity, gender stratified, and adjusted for baseline values of education, marital status, body mass index, body mass index squared, smoking status, cigarettes per day, cigarettes per day squared, duration of smoking, duration of smoking squared, age started smoking, passive smoking, vegetable/fruit/fiber consumption, fat consumption, beer, wine, liquor consumption, industrial exposures, occupation dirtiness index, and 1990 ecological covariates.

^b As above but not gender stratified. Analysis limited to 344,593 women for analysis of breast cancer mortality, 235,637 women for analysis of uterine or cervical cancer mortality, and 228,494 women for analysis of ovarian cancer mortality. Analysis limited to 278,455 men for analysis of prostate cancer mortality.

^c Women reporting a previous hysterectomy or an artificial menopause excluded here (n = 108,956).

^d Women reporting having undergone an ovarian surgery also excluded here (n = 7,143).

Table S9. Adjusted HRs (95% CIs)^a for non-lung cancer mortality per each fifth percentile–mean increment in air pollutant concentrations, stratified results according to selected risk factors, CPS-II cohort, US (1982-2004).

| Stratification variable | PM _{2.5} | | | | | | NO ₂ | | |
|------------------------------------|-------------------|---------------------------|------------------|-------------|---------------------------|------------------|-----------------|---------------------------|------------------|
| | Bladder | | | Kidney | | | Colorectal | | |
| | Deaths n | HR | 95% CI | Deaths n | HR | 95% CI | Deaths n | HR | 95% CI |
| | | per 4.4 µg/m ³ | | | per 4.4 µg/m ³ | | | per 6.5 µg/m ³ | |
| Gender | | | | | | | | | |
| Men | 986 | 1.16 | 1.05-1.29 | 586 | 1.23 | 1.08-1.40 | 3,375 | 1.06 | 1.01-1.13 |
| Women | 338 | 1.03 | 0.86-1.23 | 341 | 1.00 | 0.83-1.20 | 3,100 | 1.06 | 1.00-1.12 |
| <i>p</i> value for interaction | | 0.25 | | | 0.13 | | | 0.79 | |
| Smoking Status | | | | | | | | | |
| Never cigarettes, pipes, or cigars | 342 | 1.21 | 1.01-1.44 | 321 | 1.11 | 0.91-1.34 | 2,656 | 1.05 | 0.98-1.12 |
| Current cigarette smoker only | 358 | 1.07 | 0.89-1.27 | 217 | 1.28 | 1.03-1.59 | 1,249 | 1.06 | 0.97-1.16 |
| Former cigarette smoker only | 406 | 1.09 | 0.93-1.27 | 263 | 1.06 | 0.87-1.29 | 1,770 | 1.03 | 0.96-1.11 |
| <i>p</i> value for interaction | | 0.50 | | | 0.30 | | | 0.80 | |
| Educational Attainment | | | | | | | | | |
| <High School | 260 | 1.07 | 0.86-1.33 | 148 | 1.20 | 0.89-1.60 | 1,040 | 1.12 | 1.01-1.24 |
| High School | 357 | 1.04 | 0.87-1.24 | 290 | 1.13 | 0.92-1.39 | 2,156 | 1.15 | 1.07-1.23 |
| >High School | 707 | 1.18 | 1.05-1.33 | 489 | 1.14 | 0.99-1.32 | 3,279 | 0.99 | 0.94-1.05 |
| <i>p</i> value for interaction | | 0.67 | | | 0.97 | | | 0.03 | |

^a Age, race/ethnicity, gender stratified, and adjusted for baseline values of education, marital status, body mass index, body mass index squared, smoking status, cigarettes per day, cigarettes per day squared, duration of smoking, duration of smoking squared, age started smoking, passive smoking, vegetable/fruit/fiber consumption, fat consumption, beer, wine, liquor consumption, industrial exposures, occupation dirtiness index, and 1990 ecological covariates where appropriate.