**ONLINE SUPPLEMENT**

**Title:** Air Pollution Affects Lung Cancer Survival

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eTable 1. Leave-one-out validation of inverse distance weighted squared interpolation of monthly California air quality monitoring site data, 1988-2012.

| Summary statistic | Ozone | NO$_2$ | PM$_{2.5}$ | PM$_{10}$ |
|---|---|---|---|---|
| Mean observed (ppb or µg/m$^3$) | 43.8 | 18.4 | 13.4 | 29.3 |
| Mean estimated (ppb or µg/m$^3$)[1,2,3] | 43.9 | 17.7 | 13.1 | 28.7 |
| Mean residual (ppb or µg/m$^3$)[4] | 0.1 | -0.7 | -0.4 | -0.5 |
| Mean relative absolute value residual (ppb or µg/m$^3$)[4,5] | ±15% | ±34% | ±31% | ±35% |
| R$^2$ | 0.76 | 0.73 | 0.53 | 0.46 |
| Sample size (number of monthly pairs) | 43,812 | 26,795 | 10,636 | 32,548 |
| Mean Distance to Nearest Station (km) | 12.9 | 12.8 | 12.5 | 12.5 |
| Mean Number of Stations Used | 3.8 | 3.9 | 3.4 | 3.5 |

1.  Statistics computed for observed concentrations above 5 ppb ozone, 2 ppb NO$_2$, 3 µg/m$^3$ PM$_{2.5}$, and 6 µg/m$^3$ PM$_{10}$ since the commonly deployed instruments are inaccurate below these levels.
2.  The ozone metric is the monthly average of the 8-hour daily maximum concentrations. The NO$_2$, PM$_{2.5}$, and PM$_{10}$ metrics are the monthly average of the 24-hour average concentrations.
3.  Based on ozone, NO$_2$, and PM$_{10}$ data for 1998-2012 and PM$_{2.5}$ data for 1999-2012 in California.
4.  Residual defined as: estimated-observed
5.  Relative absolute value residual defined as: |estimated-observed|/observed

The performance of the inverse distance weighted squared (IDW2) spatial interpolation method was evaluated using leave one out validation for monthly monitoring site data. Results, shown in eTable 1, indicate the IDW2 method estimates monthly ozone, NO$_2$, PM$_{2.5}$ and PM$_{10}$ with less than 1 ppb or 1 µg/m$^3$ biases on average and with ±15%, ±34%, ±31%, and ±34% relative error on average, respectively. The coefficients of determination (r$^2$) are 0.76, 0.73, 0.53, and 0.46 for ozone, NO$_2$, PM$_{2.5}$ and PM$_{10}$, respectively. We expect that the lower R$^2$ values for PM is due to the local (primary emission) dust component that is not regional.

Temporal trends in ambient pollutant concentrations were substantial for $NO_2$, $PM_{2.5}$ and $PM_{10}$ over the course of this study. eFigure 1 shows the trends in annual average concentrations at representative air monitoring sites in Fresno, Los Angeles, Sacramento, and San Francisco. Despite year-to-year fluctuations, a downward trend was observed for all eFigure 1 locations and pollutants except for ozone in Redwood City (south of San Francisco), where reductions in NOx emissions were believed to be responsible for increased ozone levels. eTable 2 shows the percent reduction in the 3-year average pollutant concentration of $NO_2$, $PM_{10}$, and ozone from 1991 to 2009 (and for $PM_{2.5}$, from 2000-2009) at these sites. On average, the concentrations of $NO_2$, $PM_{2.5}$, and $PM_{10}$ declined at 2 to 2.5% per year in this period, whereas ozone concentrations declined at a much slower rate (<0.3% per year).

**eFigure 1**. Annual average ambient air pollutants at representative air monitoring sites from 1990-2010.
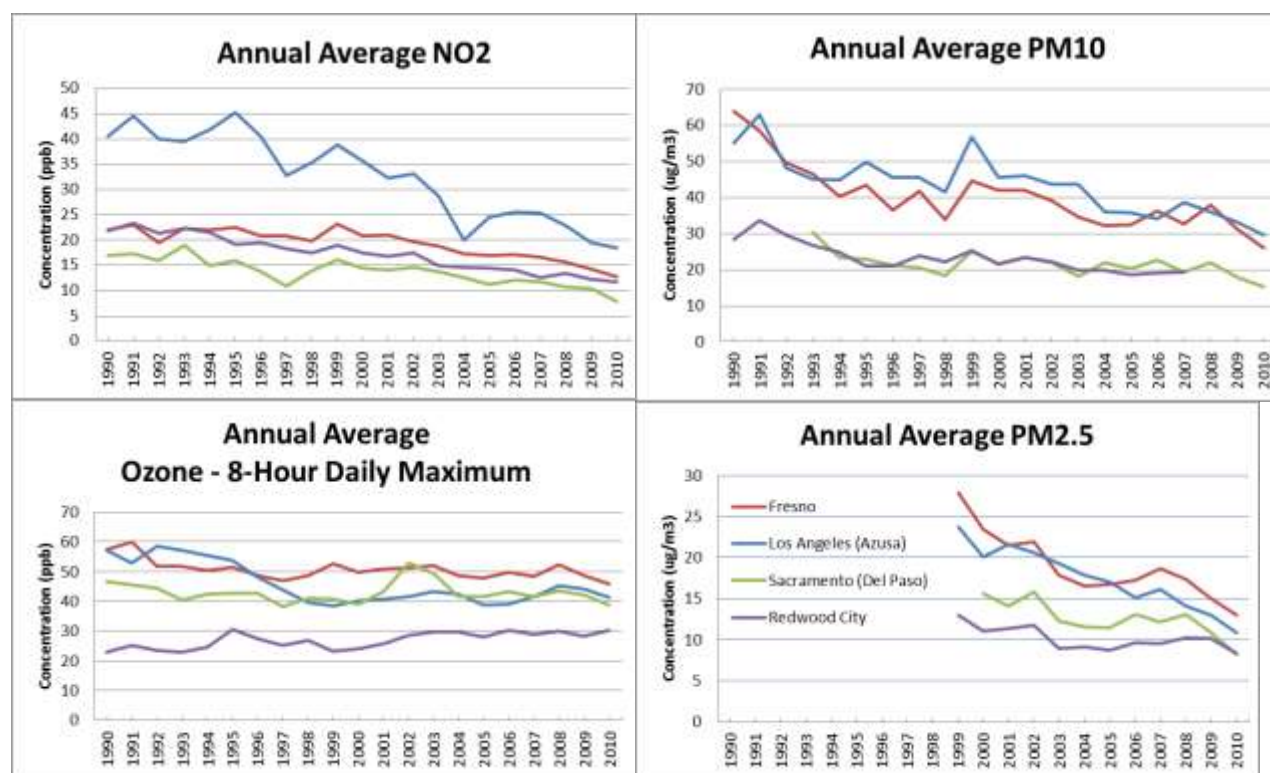


**eTable 2**. Percent reduction in 3-year average pollutant concentrations from 1990-1992 (1999-2001 for $PM_{2.5}$) to 2008-2010 at representative air monitoring sites.

| | NO$_2$ | Ozone | PM$_{10}$ | PM$_{2.5}$ |
|---|---|---|---|---|
| Region (Monitoring site) | 1991-2009 | 1991-2009 | 1991-2009 | 2000-2009 |
| Fresno (First St.) | 34% | 13% | 45% | 27% |
| Los Angeles (Azusa) | 51% | 22% | 40% | 42% |
| Sacramento (Del Paso) | 42% | 9% | 28%[1] | 16%[2] |
| San Francisco (Redwood City) | 44% | -24% | 38%[3] | 17% |
| Average (%) | 43% | 5% | 38% | 26% |
| Average (%/year) | 2.3 | 0.26 | 2.0 | 2.5 |

[1-3] Time intervals differ due to monitor data availability: (1) 1994-2009, (2) 2001-2009, (3) 1991-2005.

**eTable 3**. Distances of residential addresses at diagnosis from highways and air quality monitors, by stage at diagnosis.

| Measure (%) | Localized Only (n=59,609) | Regional (n=73,513) | Distant Site(s) (n=186,496) | Unknown (n=32,435) | Total (n=352,053) |
|---|---|---|---|---|---|
| Distance to primary interstate highway | | | | | |
| < 300 m | 8.4 | 8.6 | 8.8 | 8.4 | 8.7 |
| 300 – 1500 m | 35.3 | 35.9 | 36.6 | 34.9 | 36.1 |
| > 1500 m | 46.7 | 45.8 | 44.9 | 44.9 | 45.4 |
| % missing[a] | 9.6 | 9.6 | 9.6 | 11.8 | 9.8 |
| Distance to primary US and State highways | | | | | |
| < 300 m | 4.3 | 4.3 | 4.2 | 4.9 | 4.3 |
| 300 – 1500 m | 13.5 | 13.4 | 13.7 | 13.9 | 13.6 |
| > 1500 m | 72.6 | 72.7 | 72.6 | 69.4 | 72.3 |
| % missing[a] | 9.6 | 9.6 | 9.6 | 11.8 | 9.8 |
| Distance to the closest air quality monitor | | | | | |
| $NO_2$ | | | | | |
| < 5 km | 22.5 | 23.0 | 24.3 | 22.5 | 23.6 |
| 5-25 km | 65.1 | 63.8 | 63.0 | 60.4 | 63.3 |
| > 25 km | 6.5 | 7.0 | 6.6 | 8.3 | 6.8 |
| % missing[b] | 5.9 | 6.2 | 6.1 | 8.8 | 6.3 |
| $O_3$ | | | | | |
| < 5 km | 26.6 | 28.1 | 29.8 | 29,2 | 28.8 |
| 5-25 km | 67.0 | 65.1 | 63.5 | 60.7 | 64.2 |
| > 25 km | 3.0 | 3.4 | 3.4 | 5.1 | 3.5 |
| % missing[b] | 3.3 | 3.4 | 3.3 | 5.0 | 3.5 |
| $PM_{10}$ | | | | | |
| < 5 km | 21.1 | 22.4 | 23.7 | 21.8 | 22.8 |
| 5-25 km | 70.6 | 68.9 | 67.7 | 66.9 | 68.4 |
| > 25 km | 5.3 | 5.8 | 5.7 | 6.8 | 5.7 |
| % missing[b] | 3.0 | 3.0 | 3.0 | 4.6 | 3.1 |
| $PM_{2.5}$[c] | | | | | |
| < 5 km | 20.0 | 20.5 | 21.1 | 19.1 | 20.4 |
| 5-25 km | 66.5 | 63.8 | 61.5 | 57.7 | 62.6 |
| > 25 km | 7.8 | 8.5 | 8.4 | 10.0 | 8.4 |
| % missing[b] | 5.7 | 7.3 | 9.0 | 13.2 | 8.3 |

[a] Distance values are missing for participants with poor geocode matches (worse than street address match)
[b] Air pollution exposures assignments are missing for participants with missing geocodes and for participants with no monitors for that pollutant ≤25 km from their residence
[c] $PM_{2.5}$ data are reported only for the subset of patients whose cancer was diagnosed in 1998 or later.

**eTable 4**. All-cause mortality hazard ratios for all predictor variables in the single pollutant models in Table 4 of the main text.

| Model | NO$_2$ | | O$_3$ | | PM$_{10}$ | | PM$_{2.5}$[a] | |
|---|---|---|---|---|---|---|---|---|
| Sample size (% censored) | 305,721 (8.0) | | 327,513 (8.0) | | 320,940 (7.9) | | 160,707 (13.2) | |
| | HR | p-value | HR | p-value | HR | p-value | HR | p-value |
| Air pollution exposure[a] | 1.13 | <.001 | 1.02 | <.001 | 1.11 | <.001 | 1.16 | <.001 |
| Age | 1.01 | <.001 | 1.01 | <.001 | 1.01 | <.001 | 1.01 | <.001 |
| Sex | | | | | | | | |
|   Male | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
|   Female | 0.84 | <.001 | 0.84 | <.001 | 0.84 | <.001 | 0.82 | <.001 |
| Race/ethnicity | | | | | | | | |
|   Non-Hispanic white | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
|   Hispanic | 0.90 | <.001 | 0.93 | <.001 | 0.91 | <.001 | 0.90 | <.001 |
|   Non-Hispanic black | 0.92 | <.001 | 0.95 | <.001 | 0.95 | <.001 | 0.93 | <.001 |
|   Other/Unknown | 0.78 | <.001 | 0.80 | <.001 | 0.80 | <.001 | 0.80 | <.001 |
| Marital Status | | | | | | | | |
|   Single | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
|   Married | 0.92 | <.001 | 0.90 | <.001 | 0.90 | <.001 | 0.88 | <.001 |
|   Formerly married | 0.99 | 0.14 | 0.98 | 0.002 | 0.98 | 0.001 | 0.97 | <.001 |
|   Unknown | 0.90 | <.001 | 0.89 | <.001 | 0.89 | <.001 | 0.88 | <.001 |
| Year of diagnosis | | | | | | | | |
|   1988-1992 | 1.00 | | 1.00 | | 1.00 | | NA[a] | |
|   1993-1997 | 1.02 | <.001 | 0.98 | <.001 | 1.04 | <.001 | NA[a] | |
|   1998-2002 | 1.00 | 0.66 | 0.92 | <.001 | 0.99 | 0.31 | 1.00 | |
|   2003-2009 | 0.97 | <.001 | 0.85 | <.001 | 0.94 | <.001 | 1.09 | <.001 |
| Socioeconomic Status | | | | | | | | |
|   Lowest | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
|   Low-middle | 0.98 | 0.02 | 0.99 | 0.03 | 1.00 | 0.80 | 1.01 | 0.48 |
|   Middle | 0.95 | <.001 | 0.97 | <.001 | 0.98 | 0.05 | 1.00 | 0.98 |
|   Higher-middle | 0.92 | <.001 | 0.96 | <.001 | 0.97 | <.001 | 0.99 | 0.58 |
|   Highest | 0.90 | <.001 | 0.94 | <.001 | 0.96 | <.001 | 0.97 | 0.04 |
|   Unknown | 0.88 | <.001 | 0.91 | <.001 | 0.92 | <.001 | 0.94 | 0.004 |
| Education index | | | | | | | | |
|   Low | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
|   Low-medium | 1.03 | <.001 | 0.98 | 0.01 | 1.01 | 0.22 | 1.02 | 0.07 |
|   Medium-high | 1.03 | 0.002 | 0.96 | <.001 | 1.00 | 0.86 | 1.00 | 0.69 |
|   High | 1.01 | 0.31 | 0.94 | <.001 | 0.98 | 0.01 | 0.97 | 0.04 |
| Rural-urban commuting area | | | | | | | | |
|   Metropolitan core | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
|   Non-metropolitan core | 0.93 | <.001 | 1.03 | <.001 | 0.96 | <.001 | 0.94 | <.001 |
|   Unknown | 1.30 | 0.65 | 0.82 | 0.74 | 1.27 | 0.68 | 1.28 | 0.67 |
| Stage at diagnosis | | | | | | | | |
|   Localized only | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
|   Regional | 1.64 | <.001 | 1.65 | <.001 | 1.64 | <.001 | 1.70 | <.001 |
|   Distant site(s) | 3.06 | <.001 | 3.09 | <.001 | 3.06 | <.001 | 3.20 | <.001 |
|   Unknown | 1.44 | <.001 | 1.45 | <.001 | 1.43 | <.001 | 1.46 | <.001 |
| Histology at diagnosis | | | | | | | | |
|   Squamous cell | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
|   Adenocarcinoma | 0.94 | <.001 | 0.94 | <.001 | 0.94 | <.001 | 0.90 | <.001 |
|   Small cell | 1.13 | <.001 | 1.12 | <.001 | 1.13 | <.001 | 1.16 | <.001 |
|   Large cell | 1.09 | <.001 | 1.09 | <.001 | 1.10 | <.001 | 1.13 | <.001 |
|   Others | 0.92 | <.001 | 0.91 | <.001 | 0.92 | <.001 | 0.97 | 0.001 |
| Surgery | | | | | | | | |
|   No | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
|   Yes | 0.33 | <.001 | 0.33 | <.001 | 0.33 | <.001 | 0.31 | <.001 |
|   Unknown | 0.80 | <.001 | 0.80 | <.001 | 0.78 | <.001 | 1.11 | 0.27 |
| Radiation | | | | | | | | |
|   No | 1.00 | | 1.00 | | 1.000 | | 1.00 | |
|   Yes | 0.83 | <.001 | 0.82 | <.001 | 0.83 | <.001 | 0.86 | <.001 |
|   Unknown | 1.41 | <.001 | 1.44 | <.001 | 1.37 | <.001 | 0.94 | 0.54 |
| Chemotherapy | | | | | | | | |
|   No | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
|   Yes | 0.62 | <.001 | 0.62 | <.001 | 0.62 | <.001 | 0.60 | <.001 |
|   Unknown | 1.07 | <.001 | 1.07 | <.001 | 1.07 | <.001 | 1.14 | <.001 |
| Distance to primary interstate highway | | | | | | | | |
|   < 300 m | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
|   300 – 1500 m | 0.99 | 0.08 | 0.99 | 0.14 | 0.99 | 0.05 | 0.98 | 0.03 |
|   > 1500 m | 1.00 | 0.69 | 0.99 | 0.03 | 0.98 | 0.01 | 0.99 | 0.30 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Missing | 1.00 | 0.91 | 0.98 | 0.04 | 0.97 | 0.04 | 0.99 | 0.42 |
| **Distance to primary US and State highways** | | | | | | | | |
| < 300m | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
| 300 – 1500 m | 0.97 | 0.01 | 0.97 | 0.002 | 0.97 | 0.003 | 0.97 | 0.05 |
| > 1500 m | 1.00 | 0.66 | 0.98 | 0.07 | 0.98 | 0.04 | 0.98 | 0.13 |
| Missing[b] | NA | NA | NA | NA | NA | NA | NA | NA |
| **Month of diagnosis** | | | | | | | | |
| January | 1.00 | | 1.00 | | 1.00 | | 1.00 | |
| February | 1.05 | <.001 | 1.04 | <.001 | 1.04 | <.001 | 1.07 | <.001 |
| March | 1.06 | <.001 | 1.04 | <.001 | 1.05 | <.001 | 1.06 | <.001 |
| April | 1.06 | <.001 | 1.05 | <.001 | 1.04 | <.001 | 1.06 | <.001 |
| May | 1.06 | <.001 | 1.04 | <.001 | 1.04 | <.001 | 1.04 | <.001 |
| June | 1.05 | <.001 | 1.05 | <.001 | 1.04 | <.001 | 1.04 | 0.01 |
| July | 1.05 | <.001 | 1.05 | <.001 | 1.04 | <.001 | 1.05 | <.001 |
| August | 1.05 | <.001 | 1.06 | <.001 | 1.04 | <.001 | 1.04 | <.001 |
| September | 1.06 | <.001 | 1.08 | <.001 | 1.06 | <.001 | 1.04 | 0.003 |
| October | 1.04 | <.001 | 1.06 | <.001 | 1.04 | <.001 | 1.03 | 0.002 |
| November | 1.06 | <.001 | 1.08 | <.001 | 1.07 | <.001 | 1.06 | 0.01 |
| December | 1.08 | <.001 | 1.08 | <.001 | 1.08 | <.001 | 1.08 | <.001 |

[a] $PM_{2.5}$ data are reported only for the subset of patients whose cancer was diagnosed in 1998 or later.

[b] Only one of the identical "missing" categories for the two distance metrics can be estimated.

**eTable 5a**. Sensitivity analysis for $NO_2$ and $O_3$: adjusted[a] all-cause mortality hazard ratios (and 95% confidence intervals) associated with a standard deviation (SD) increase in $NO_2$ or $O_3$ exposure,[b] from models stratified by stage at diagnosis (like those in Table 4) but with additional stratification by factors of interest.

| Stratifying factor | $NO_2$ Local | $NO_2$ Regional | $NO_2$ Distant | $O_3$ Local | $O_3$ Regional | $O_3$ Distant |
|---|---|---|---|---|---|---|
| None (Table 4 value) | 1.30 (1.28, 1.32) | 1.18 (1.17, 1.20) | 1.07 (1.07, 1.08) | 1.04 (1.02, 1.05) | 1.03 (1.02, 1.04) | 1.01 (1.01, 1.02) |
| Sex | | | | | | |
| Male | 1.29 (1.27, 1.32) | 1.18 (1.16, 1.19) | 1.07 (1.06, 1.08) | 1.04 (1.02, 1.06) | 1.03 (1.02, 1.05) | 1.01 (1.01, 1.02) |
| Female | 1.31 (1.28, 1.33) | 1.20 (1.18, 1.21) | 1.07 (1.06, 1.08) | 1.03 (1.01, 1.05) | 1.03 (1.01, 1.04) | 1.01 (1.01, 1.02) |
| Race | | | | | | |
| Non-Hispanic white | 1.30 (1.28, 1.32) | 1.18 (1.17, 1.19) | 1.07 (1.06, 1.08) | 1.04 (1.02, 1.05) | 1.03 (1.02, 1.04) | 1.01 (1.00, 1.02) |
| Hispanic | 1.28 (1.21, 1.34) | 1.21(1.17, 1.26) | 1.09 (1.07, 1.11) | 1.04 (0.98, 1.10) | 1.10 (1.05, 1.14) | 1.02 (1.00, 1.04) |
| Non-Hispanic black | 1.31 (1.25, 1.38) | 1.21(1.16, 1.26) | 1.06 (1.04, 1.08) | 1.02 (0.96, 1.07) | 1.01 (0.97, 1.05) | 1.04 (1.02, 1.06) |
| Other/Unknown | 1.37 (1.29, 1.46) | 1.18 (1.13, 1.23) | 1.08 (1.06, 1.11) | 1.05 (0.98, 1.13) | 0.96 (0.92, 1.01) | 1.03 (1.01, 1.06) |
| Year of diagnosis | | | | | | |
| 1988-1992 | 1.29 (1.26, 1.31) | 1.16 (1.14, 1.18) | 1.06 (1.05, 1.08) | 1.15 (1.12, 1.17) | 1.10 (1.08, 1.12) | 1.03 (1.02, 1.04) |
| 1993-1997 | 1.24 (1.21, 1.27) | 1.14 (1.12, 1.16) | 1.05 (1.04, 1.06) | 1.01 (0.98, 1.04) | 1.03 (1.01, 1.05) | 1.02 (1.01, 1.03) |
| 1998-2002 | 1.41 (1.37, 1.45) | 1.26 (1.23, 1.29) | 1.09 (1.07, 1.10) | 0.91 (0.88, 0.93) | 0.93 (0.91, 0.96) | 0.99 (0.98, 1.01) |
| 2003-2009 | 1.36 (1.30, 1.42) | 1.24 (1.21, 1.28) | 1.10 (1.08, 1.12) | 1.03 (0.99, 1.06) | 1.00 (0.98, 1.03) | 1.00 (0.99, 1.01) |
| Distance to closest air quality monitor | | | | | | |
| <5 km | 1.27 (1.24, 1.30) | 1.15 (1.13, 1.17) | 1.06 (1.05, 1.07) | 1.05 (1.03, 1.08) | 1.05 (1.03, 1.07) | 1.03 (1.02, 1.04) |
| 5-25 km | 1.32 (1.30, 1.34) | 1.20 (1.18, 1.21) | 1.08 (1.07, 1.09) | 1.03 (1.01, 1.05) | 1.02 (1.01, 1.04) | 1.01 (1.00, 1.01) |
| Highest quality geocode match (street-address) | 1.30 (1.29, 1.32) | 1.19 (1.17, 1.20) | 1.07 (1.06, 1.08) | 1.03 (1.02, 1.05) | 1.03 (1.02, 1.04) | 1.01 (1.01, 1.02) |
| Rural-urban commuting area metropolitan core | | | | | | |
| No | 1.44 (1.34, 1.55) | 1.32 (1.24, 1.41) | 1.15 (1.11, 1.20) | 1.09 (1.05, 1.15) | 1.08 (1.05, 1.12) | 1.03 (1.01, 1.04) |
| Yes | 1.30 (1.28, 1.31) | 1.18 (1.17, 1.19) | 1.07 (1.06, 1.08) | 1.03 (1.01, 1.05) | 1.03 (1.01, 1.04) | 1.01 (1.01, 1.02) |
| Specific urban areas[c] | | | | | | |
| Los Angeles county | 2.23 (2.15, 2.31) | 1.73 (1.68, 1.79) | 1.24 (1.23, 1.26) | 1.11 (1.08, 1.16) | 1.08 (1.05, 1.11) | 1.02 (1.00, 1.03) |
| Bay area counties[c] | 3.24 (3.01, 3.49) | 2.25 (2.13, 2.39) | 1.32 (1.28, 1.36) | 0.73 (0.67, 0.78) | 0.86 (0.81, 0.91) | 1.02 (0.99, 1.04) |
| San Diego county | 4.87 (4.34, 5.46) | 2.73 (2.50, 2.98) | 1.39 (1.33, 1.45) | 2.13 (1.85, 2.44) | 1.54 (1.38, 1.72) | 1.10 (1.04, 1.15) |
| All other counties | 1.32 (1.29, 1.35) | 1.19 (1.17, 1.22) | 1.08 (1.07, 1.10) | 1.08 (1.05, 1.10) | 1.05 (1.03, 1.07) | 1.01 (1.00, 1.02) |

[a] Adjusted for age, sex, race/ethnicity, marital status, education index, SES, RUCA, distance to primary interstate highway, distance to primary US and State highways, month of diagnosis, year of diagnosis, and initial treatment
[b] SD values: 10.2 ppb for $NO_2$, 11.9 ppb for $O_3$, 12.1 μg/m$^3$ for $PM_{10}$, and 5.3 μg/m$^3$ for $PM_{2.5}$
[c] % of cases located in specific urban areas: 24.0% in Los Angeles county, 21.0% in Bay area counties, 8.6% in San Diego County.
[d] San Francisco Bay area counties: Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma

**eTable 5b**. Sensitivity analysis for $PM_{10}$ and $PM_{2.5}$: adjusted[a] all-cause mortality hazard ratios (and 95% confidence intervals) associated with a standard deviation (SD) increase in $PM_{10}$ and $PM_{2.5}$ exposure,[b] from models stratified by stage at diagnosis (like those in Table 4) but with additional stratification by factors of interest.

| Stratifying factor | $PM_{10}$ Local | Regional | Distant | $PM_{2.5}$[c] Local | Regional | Distant |
|---|---|---|---|---|---|---|
| None (Table 4 value) | 1.26 (1.25, 1.28) | 1.16 (1.15, 1.17) | 1.07 (1.06, 1.07) | 1.38 (1.35, 1.41) | 1.26 (1.24, 1.28) | 1.10 (1.09, 1.11) |
| Sex | | | | | | |
| Male | 1.26 (1.24, 1.28) | 1.15 (1.14, 1.17) | 1.06 (1.05, 1.07) | 1.36 (1.33, 1.40) | 1.24 (1.21, 1.26) | 1.10 (1.08, 1.11) |
| Female | 1.26 (1.24, 1.28) | 1.17 (1.16, 1.19) | 1.07 (1.06, 1.08) | 1.40 (1.36, 1.45) | 1.28 (1.25, 1.31) | 1.11 (1.10, 1.13) |
| Race | | | | | | |
| Non-Hispanic white | 1.25 (1.24, 1.27) | 1.15 (1.14, 1.17) | 1.06 (1.05, 1.07) | 1.38 (1.35, 1.41) | 1.24 (1.22, 1.26) | 1.10 (1.09, 1.11) |
| Hispanic | 1.28 (1.22, 1.34) | 1.21 (1.17, 1.25) | 1.09 (1.07, 1.12) | 1.39 (1.29, 1.51) | 1.31 (1.24, 1.38) | 1.11 (1.08, 1.14) |
| Non-Hispanic black | 1.32 (1.26, 1.39) | 1.22 (1.18, 1.27) | 1.09 (1.07, 1.12) | 1.47 (1.36, 1.59) | 1.33 (1.26, 1.40) | 1.12 (1.09, 1.15) |
| Other/Unknown | 1.35 (1.27, 1.43) | 1.16 (1.11, 1.22) | 1.09 (1.07, 1.12) | 1.39 (1.27, 1.51) | 1.32 (1.24, 1.40) | 1.11 (1.08, 1.14) |
| Year of diagnosis | | | | | | |
| 1988-1992 | 1.38 (1.35, 1.41) | 1.20 (1.18, 1.22) | 1.08 (1.07, 1.09) | NA[c] | NA[c] | NA[c] |
| 1993-1997 | 1.12 (1.10, 1.15) | 1.09 (1.07,1.11) | 1.05 (1.04, 1.06) | NA[c] | NA[c] | NA[c] |
| 1998-2002 | 1.24 (1.20, 1.27) | 1.16 (1.14, 1.19) | 1.06 (1.04, 1.07) | 1.39 (1.35, 1.42) | 1.27 (1.24, 1.30) | 1.10 (1.09, 1.11) |
| 2003-2009 | 1.27 (1.23, 1.31) | 1.16 (1.13, 1.18) | 1.08 (1.06, 1.09) | 1.39 (1.34, 1.44) | 1.24 (1.21, 1.27) | 1.11 (1.09, 1.12) |
| Distance to closest air quality monitor | | | | | | |
| <5 km | 1.17 (1.14, 1.20) | 1.09 (1.07, 1.11) | 1.04 (1.03, 1.06) | 1.38 (1.33, 1.44) | 1.23 (1.20, 1.27) | 1.09 (1.08, 1.11) |
| 5-25 km | 1.31 (1.29, 1.33) | 1.20 (1.18, 1.21) | 1.08 (1.07, 1.09) | 1.39 (1.36, 1.42) | 1.26 (1.24, 1.29) | 1.11 (1.10, 1.12) |
| Highest quality geocode match (street-address) | 1.26 (1.24, 1.28) | 1.16 (1.15, 1.17) | 1.07 (1.06, 1.07) | 1.38 (1.35, 1.41) | 1.26 (1.24, 1.28) | 1.10 (1.09, 1.11) |
| Rural-urban commuting area metropolitan core | | | | | | |
| No | 1.19 (1.15, 1.24) | 1.11 (1.08, 1.14) | 1.04 (1.03, 1.06) | 1.25 (1.16, 1.34) | 1.16 (1.10, 1.24) | 1.08 (1.05, 1.12) |
| Yes | 1.27 (1.26, 1.29) | 1.17 (1.16, 1.18) | 1.07 (1.06, 1.08) | 1.40 (1.37, 1.43) | 1.27 (1.25, 1.29) | 1.10 (1.10, 1.11) |
| Specific urban areas[d] | | | | | | |
| Los Angeles county | 2.62 (2.51, 2.74) | 1.92 (1.86, 1.99) | 1.28 (1.26, 1.31) | 2.96 (2.77, 3.15) | 2.32 (2.21, 2.44) | 1.38 (1.35, 1.41) |
| Bay area counties[e] | 3.86 (3.59, 4.15) | 2.52 (2.38, 2.67) | 1.31 (1.28, 1.35) | 4.12 (3.64, 4.66) | 2.94 (2.67, 3.24) | 1.35 (1.29, 1.41) |
| San Diego county | 2.33 (2.11, 2.58) | 1.71 (1.57, 1.85) | 1.25 (1.20, 1.30) | 3.49 (2.99, 4.07) | 2.32 (2.04, 2.63) | 1.47 (1.38, 1.56) |
| All other counties | 1.21 (1.19, 1.23) | 1.12 (1.11, 1.13) | 1.05 (1.04, 1.06) | 1.33 (1.29, 1.36) | 1.22 (1.19, 1.25) | 1.10 (1.09, 1.11) |

[a] Adjusted for age, sex, race/ethnicity, marital status, education index, SES, RUCA, distance to primary interstate highway, distance to primary US and State highways, month of diagnosis, year of diagnosis, and initial treatment. In models stratifying by one of these factors, there is no adjustment for the factor.
[b] SD values: 10.2 ppb for $NO_2$, 11.9 ppb for $O_3$, 12.1 $\mu g/m^3$ for $PM_{10}$, and 5.3 $\mu g/m^3$ for $PM_{2.5}$
[c] $PM_{2.5}$ results are only for the subset of patients whose cancer was diagnosed in 1998 or later
[d] % of cases located in specific urban areas: 24.0% in Los Angeles county, 21.0% in Bay area counties, 8.6% in San Diego County.
[e] San Francisco Bay area counties: Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma