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Supplemental Material

Contribution of Long-Term Exposure to Outdoor Black Carbon to the Carcinogenicity of Air Pollution: Evidence regarding Risk of Cancer in the Gazel Cohort

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Figure S1. Flowchart of the selection of Gazel participants included in the analyses pertaining to all-site and lung cancer.

Figure S2. Mean and standard deviation of the synthetic values plotted against iteration number for the imputed data. Smokpac: smoking pack-years; fdep2009: deprivation index (put back as nonimputed values in the final database); smokpas: passive smoking at work or at home; alcoclass: alcohol consumption; family1: marital status; vegfr: fruit and vegetable intake; ses: socioeconomic status; educ1: education; density2: urban classification (put back as nonimputed values in the final database).

Figure S3. On the top tier, exposure-response relationship between cumulative air pollutant (x-axis: black carbon in 10^{-5}/m, $PM_{2.5}$ in µg/m^3, and NO_2 in µg/m^3) and all-site cancer risk in the Gazel cohort (using a $_3$-degree of freedom spline function); on the bottom tier, the corresponding distribution of the exposure among the 293,210 person-years for the all-site cancer analysis (3,711 cases). Hazard ratios and confidence intervals estimated by separate single-pollutant Cox model with attained age as underlying time-scale and time-dependent variables, adjusted for sex, cumulative smoking pack-years, passive smoking, alcohol use, BMI, education, socioeconomic status, family status, vegetable and fruit consumption, occupational exposure to lung carcinogens, age at inclusion and calendar time. Exposures were lagged 10 years. Participants were excluded from the analysis if they were diagnosed with cancer before 1999.

Figure S4. Maps of the relative change (%) between the black carbon exposure assessment for all available Gazel participants between 1995 and 2000 (left, reference year 1995) and 2000 and 2005 (right, reference year 2000). For example, the dark orange values indicate that the black carbon estimates were up to 50% higher in 2000 than in 1995 and the dark blue values that black carbon estimates were up to 70% lower in 2005 than in 2000.

Table S1. Cancer cases breakdown by year for all-site cancer and lung cancer in the study period (1999-2015), as numbers and cumulative percentages. Cases diagnosed during 1989–1998 were excluded, thereby limiting the study period to 1999–2015.

Table S2. Cancer cases breakdown by site for first-occurring cases of all-site cancer in the study period (1999-2015), as numbers and percentages. Cases diagnosed during 1989–1998 were excluded, thereby limiting the study period to 1999–2015.

Table S3. Associations between black carbon and its residuals and $PM_{2.5}$ (in separate single-pollutant models) with incident all-site and lung cancer as hazard ratios (HR) and their 95% confidence intervals (CI), implementing either a 10-year or a 2-year lag period.

Table S4. Associations between cumulative black carbon (top half) and $PM_{2.5}$ (bottom half) and all-site incident cancer in the main, sensitivity, and stratified analyses with the number of identified cancer cases among the number of participant-year over the follow-up, implementing a 10-year lag period. These numbers correspond to Figure 2.

Table S5. Associations between cumulative black carbon (top half) and $PM_{2.5}$ (bottom half) and lung incident cancer in the main and sensitivity analyses with the number of identified cancer cases among the number of participant-year over the follow-up. These numbers corresponding to Figure 3.