**Supplementary Material 2.** Odds ratios for SO2 and O3 with a 2-year lag period for pulmonary function using multivariate logistic regression analysis after adjusting for covariates.

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|  | SO2 2y, median (max), ppb |
| Model | Q1, 3.4 (4.0) | Q2, 4.4 (4.7) | Q3, 5.4 (5.4) | Q4, 6.3 (22.5) | *P* for trend1 |
| Total | Restrictive | Ref | 1.000 [0.859, 1.163] | 0.913 [0.782, 1.066] | 0.899 [0.772, 1.048] | 0.096  |
| COPD | Ref | 0.997 [0.862, 1.154] | 1.087 [0.938, 1.259] | 1.001 [0.861, 1.164] | 0.764  |
| ≥ Moderate obstruction | Ref | 1.009 [0.853, 1.192] | 1.056 [0.881, 1.267] | 1.072 [0.896, 1.283] | 0.382  |
| Male | Restrictive | Ref | 0.991 [0.805, 1.219] | 0.871 [0.700, 1.082] | 0.825 [0.669, 1.017] | 0.034  |
| COPD | Ref | 1.061 [0.889, 1.267] | 1.097 [0.918, 1.311] | 0.994 [0.828, 1.193] | 0.956  |
| ≥Moderate obstruction | Ref | 1.111 [0.904, 1.365] | 1.105 [0.884, 1.380] | 1.109 [0.886, 1.388] | 0.425  |
| Female | Restrictive | Ref | 1.022 [0.834, 1.252] | 0.963 [0.794, 1.167] | 0.988 [0.813, 1.200] | 0.768  |
| COPD | Ref | 0.891 [0.704, 1.128] | 1.075 [0.829, 1.393] | 1.025 [0.802, 1.310] | 0.519  |
| ≥ Moderate obstruction | Ref | 0.834 [0.621, 1.121] | 0.962 [0.685, 1.353] | 1.017 [0.745, 1.389] | 0.661  |
| Non-smoker | Restrictive | Ref | 0.982 [0.836, 1.155] | 0.921 [0.785, 1.080] | 0.902 [0.769, 1.057] | 0.152  |
| COPD | Ref | 1.027 [0.877, 1.204] | 1.071 [0.904, 1.268] | 1.003 [0.845, 1.189] | 0.903  |
| ≥ Moderate obstruction | Ref | 1.087 [0.895, 1.319] | 1.040 [0.837, 1.292] | 1.065 [0.862, 1.315] | 0.687  |
| Current smoker | Restrictive | Ref | 1.087 [0.776, 1.524] | 0.882 [0.618, 1.259] | 0.874 [0.618, 1.236] | 0.240  |
| COPD | Ref | 0.935 [0.710, 1.230] | 1.114 [0.848, 1.463] | 0.985 [0.751, 1.293] | 0.792  |
| ≥ Moderate obstruction | Ref | 0.851 [0.617, 1.172] | 1.071 [0.769, 1.491] | 1.081 [0.778, 1.502] | 0.363  |
| 　 | O3 2y, median (max), ppb |
| Model | Q1, 20.6 (22.4) | Q2, 23.7 (24.8) | Q3, 25.7 (27.0) | Q4, 28.9 (40.7) | p for Trend1 |
| Total | Restrictive | Ref | 0.903 [0.781, 1.044] | 0.841 [0.720, 0.982] | 0.847 [0.729, 0.984] | 0.020  |
| COPD | Ref | 0.929 [0.812, 1.063] | 0.842 [0.726, 0.976] | 0.938 [0.818, 1.077] | 0.232  |
| ≥ Moderate obstruction | Ref | 0.956 [0.803, 1.137] | 0.835 [0.701, 0.996] | 0.862 [0.728, 1.020] | 0.038  |
| Male | Restrictive | Ref | 0.902 [0.732, 1.111] | 0.805 [0.653, 0.993] | 0.784 [0.639, 0.964] | 0.012  |
| COPD | Ref | 0.996 [0.841, 1.180] | 0.948 [0.791, 1.135] | 0.932 [0.782, 1.110] | 0.360  |
| ≥Moderate obstruction | Ref | 1.009 [0.812, 1.254] | 0.894 [0.719, 1.112] | 0.845 [0.682, 1.047] | 0.068  |
| Female | Restrictive | Ref | 0.907 [0.752, 1.096] | 0.883 [0.712, 1.096] | 0.899 [0.738, 1.095] | 0.281  |
| COPD | Ref | 0.807 [0.636, 1.023] | 0.662 [0.515, 0.852] | 0.938 [0.750, 1.173] | 0.396  |
| ≥ Moderate obstruction | Ref | 0.842 [0.619, 1.146] | 0.728 [0.529, 1.002] | 0.866 [0.644, 1.165] | 0.266  |
| Non-smoker | Restrictive | Ref | 0.890 [0.763, 1.038] | 0.884 [0.747, 1.047] | 0.851 [0.725, 1.000] | 0.063  |
| COPD | Ref | 0.907 [0.775, 1.063] | 0.789 [0.670, 0.929] | 0.875 [0.747, 1.026] | 0.053  |
| ≥ Moderate obstruction | Ref | 0.901 [0.737, 1.102] | 0.777 [0.634, 0.951] | 0.759 [0.626, 0.919] | 0.002  |
| Current smoker | Restrictive | Ref | 0.952 [0.692, 1.310] | 0.665 [0.477, 0.928] | 0.826 [0.589, 1.159] | 0.083  |
| COPD | Ref | 0.971 [0.751, 1.254] | 0.985 [0.741, 1.309] | 1.129 [0.868, 1.467] | 0.392  |
| ≥ Moderate obstruction | Ref | 1.075 [0.770, 1.501] | 0.970 [0.688, 1.367] | 1.163 [0.830, 1.631] | 0.520  |

Model for restrictive lung disease: normal as a reference (total, n = 20,598; male, n = 7,782; female, n = 12,816; non-smokers, n = 17,408; current smokers, n = 3,190) and the restrictive lung disease group as the event (total, n = 2,995; male, n = 1,439; female, n = 1,556; non-smokers, n = 2,480; current smokers, n = 515) as the dependent variable.

Model for COPD: normal as reference versus COPD as the event (total, n = 3,785; male, n = 2,759; female, n = 1,026; non-smokers, n = 2,681; current smokers, n = 1,104).

Model for ≥ moderate obstruction: normal as reference and moderate, severe, and very severe obstruction groups as the event (total, n = 2,024; male, n = 1,475; female, n = 549; non-smokers, n = 1,413; current smokers, n = 611).

Non-smokers were those who indicated ‘no’ in response to items asking whether individuals had a lifetime cigarette smoking history of 5 packs or more and currently smoked.

Current smokers were those who indicated ‘yes’ in response to items asking whether individuals had a lifetime cigarette smoking history of 5 packs or more and currently smoked.

The covariates were age, sex, residential area, education level, household income, smoking status, obesity, temperature, and relative humidity.

1 *P* for trend values were obtained from the test for linear trend for air pollution.