### Supplementary

**Table S1** District-specific characteristics of households in four Chinese cities in Period 1 and Period 2, showing number and proportion (%, in the parentheses) for each parameter

| City     | District | N    | Separate kitchen | Cooking with coal as fuel | Cooking ventilation |
|----------|----------|------|------------------|---------------------------|--------------------|
|          |          |      |                  |                           |                    |
| Chongqing| Urban    | 1011 | 459 (45.4)       | 67 (6.6)                  | 675 (66.8)         |
|          | Suburban | 441  | 279 (63.3)       | 8 (1.8)                   | 289 (65.5)         |
|          | Urban    | 1599 | 786 (49.2)       | 14 (0.9)                  | 1587 (99.2)        |
|          | Suburban | 527  | 239 (45.4)       | 6 (1.1)                   | 524 (99.4)         |
| Wuhan    | Urban    | 1924 | 1040 (54.1)      | 664 (34.5)                | 739 (38.4)         |
|          | Suburban | 593  | 250 (42.2)       | 229 (38.6)                | 298 (50.3)         |
|          | Urban    | 1985 | 841 (42.4)       | 71 (3.6)                  | 1675 (84.4)        |
|          | Suburban | 1167 | 530 (45.4)       | 71 (6.1)                  | 1058 (90.7)        |
| Lanzhou  | Urban    | 716  | 269 (37.6)       | 104 (14.5)                | 512 (71.5)         |
|          | Suburban | 767  | 726 (94.7)       | 706 (92.0)                | 736 (96.0)         |
|          | Urban    | 848  | 602 (71.0)       | 11 (1.3)                  | 750 (88.4)         |
|          | Suburban | 1218 | 880 (72.2)       | 28 (2.3)                  | 1108 (90.9)        |
| Guangzhou| Urban    | 920  | 522 (56.7)       | 138 (15.0)                | 891 (96.8)         |
|          | Suburban | 1382 | 946 (68.5)       | 19 (1.4)                  | 1359 (98.3)        |
|          | Urban    | 1311 | 578 (44.1)       | 18 (1.4)                  | 1287 (98.2)        |
|          | Suburban | 995  | 261 (26.2)       | 10 (1.0)                  | 979 (98.4)         |
| City (Period) | District | N       | Male | Male | Male | Male | Female | Female | Female |
|--------------|---------|---------|------|------|------|------|--------|--------|--------|
|              |         |         | Smoking | Education | Occupation | Smoking | Education | Occupation | Smoking | Education | Occupation |
| Chongqing    |         |         |         |         |         |         |         |         |         |
| Period 1     | Urban   | 1011    | 759    | 75.1  | 259    | 25.6  | 405    | 40.1   | 380    | 37.6   | 24    | 2.4   | 151     | 14.9   | 455    | 45.0   | 389    | 38.5   |
|              | Suburban| 441     | 354    | 80.3  | 50     | 11.3  | 269    | 61.0   | 97     | 22.0   | 5     | 1.1   | 20      | 4.5    | 294    | 66.7   | 94     | 21.3   |
| Period 2     | Urban   | 1599    | 703    | 44.0  | 393    | 55.9  | 642    | 40.2   | 702    | 43.9   | 16    | 1.0   | 380     | 23.8   | 485    | 30.3   | 885    | 55.3   |
|              | Suburban| 527     | 233    | 44.2  | 103    | 19.5  | 186    | 35.3   | 247    | 46.9   | 6     | 1.1   | 104     | 19.7   | 138    | 26.3   | 327    | 62.0   |
| Wuhan        |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
| Period 1     | Urban   | 1924    | 1613   | 83.8  | 324    | 16.8  | 1007   | 52.3   | 779    | 40.5   | 28    | 1.5   | 140     | 7.3    | 1006   | 52.3   | 804    | 41.8   |
|              | Suburban| 593     | 467    | 78.8  | 44     | 7.4   | 483    | 81.4   | 88     | 14.8   | 5     | 0.8   | 16      | 2.7    | 464    | 78.2   | 85     | 14.3   |
| Period 2     | Urban   | 1985    | 833    | 44.5  | 489    | 24.6  | 374    | 18.8   | 309    | 15.6   | 17    | 0.9   | 441     | 22.2   | 312    | 15.7   | 319    | 16.1   |
|              | Suburban| 1167    | 542    | 46.4  | 229    | 19.6  | 694    | 59.5   | 379    | 32.5   | 3     | 0.3   | 187     | 9.4    | 550    | 47.1   | 433    | 37.1   |
| Lanzhou      |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
| Period 1     | Urban   | 716     | 541    | 75.6  | 98     | 13.7  | 361    | 50.4   | 323    | 45.1   | 6     | 0.8   | 42      | 5.9    | 344    | 48.0   | 307    | 42.9   |
|              | Suburban| 767     | 627    | 81.7  | 1      | 0.1   | 721    | 94.0   | 36     | 4.7    | 3     | 0.4   | 0       | 0.0    | 740    | 96.5   | 16     | 2.1    |
| Period 2     | Urban   | 848     | 403    | 47.5  | 461    | 54.4  | 142    | 16.7   | 353    | 41.6   | 2     | 0.2   | 426     | 50.2   | 137    | 16.2   | 344    | 40.6   |
|              | Suburban| 1218    | 541    | 44.4  | 283    | 23.2  | 526    | 43.2   | 283    | 23.2   | 5     | 0.4   | 261     | 21.4   | 412    | 33.8   | 355    | 29.1   |
| Guangzhou    |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |
| Period 1     | Urban   | 920     | 635    | 69.0  | 177    | 19.2  | 314    | 34.1   | 555    | 60.3   | 13    | 1.4   | 112     | 12.2   | 312    | 33.9   | 545    | 59.2   |
|              | Suburban| 1382    | 804    | 58.2  | 744    | 53.8  | 247    | 17.9   | 944    | 68.3   | 10    | 0.7   | 491     | 35.5   | 321    | 23.2   | 993    | 71.9   |
| Period 2     | Urban   | 1311    | 628    | 47.9  | 517    | 39.4  | 371    | 28.3   | 711    | 54.2   | 1     | 0.1   | 529     | 40.4   | 324    | 24.7   | 758    | 57.8   |
|              | Suburban| 995     | 291    | 29.2  | 601    | 60.4  | 72     | 7.2    | 723    | 72.7   | 70    | 7.0   | 568     | 57.1   | 66     | 6.6    | 677    | 68.0   |
Table S3: Estimates and 95% CI (in parentheses) of the change in respiratory disease prevalences associated with 1% decrease in the prevalence of indoor air pollution surrogates or an interquartile range (IQR) decrease in outdoor air pollutant concentrations, based on sensitivity analysis

| Variables                  | Period 1       |          | Period 2       |          |
|----------------------------|----------------|----------|----------------|----------|
|                            |                | Male     | Female         | Male     | Female |
|                            |                | Asthma   | Chronic bronchitis | Asthma   | Chronic bronchitis |
| Indoor air pollution surrogates | 0.0075 0.2746 | 0.7879 −0.4000 | 0.0116 −0.0361 | −0.0460 −0.0183 |
| Active smoke               | 0.4239 −6.7749| −0.0100 0.0138 | −0.0428 0.1133 | 0.0143 −0.0047 |
| Passive smoke              | 0.0090 −0.1528| 0.0287 −0.0043 | −0.0043 0.0518**| −0.0038 0.0229 |
| Kitchen type               | 0.0014 0.1684 | −0.0186** 0.0182 | −0.0194 0.2289 | −0.0706 0.1346 |
| Cooking coal               | −0.0010 −0.0739| 0.0091 −0.0071 | 0.0058 −0.0484 | −0.0097 −0.0049 |
| Cooking ventilation        | 0.0028 0.0273 | 0.0011 0.0070 | 0.0006 −0.0052 | 0.0014 0.0060 |
| Outdoor air pollutants     | 0.0028 0.0353 | 0.0008 0.0091 | 0.0006 −0.0132 | 0.0004 −0.0031 |
| PM$_{2.5}$                 | 0.0019 −0.0057| 0.0025 −0.0001 | 0.0015 −0.0633 | 0.0020 −0.0148 |
| PM$_{10}$                  |                |          |                |          |
| SO$_2$                     |                |          |                |          |

**, P<0.05. The IQRs for PM$_{2.5}$, PM$_{10}$ and SO$_2$ are 34, 51, and 43 mg/m$^3$, respectively.