**Supplemental material**

**Table S1.** Annual and four seasonal average concentrations of PM2.5 (Mean ± SD) in the 194 cities: 2015-2019.

|  |  |
| --- | --- |
|  | PM2.5(μg/m³) |
| Yearly | Spring | Summer | Autumn | Winter |
| 2015 | 53 ± 44 | 48 ± 28 | 36 ± 23 | 50 ± 42 | 79 ± 60 |
| 2016 | 48 ± 41 | 47 ± 29 | 30 ± 18 | 46 ± 35 | 72 ± 57 |
| 2017 | 47 ± 39 | 44 ± 28 | 29 ± 17 | 42 ± 32 | 72 ± 54 |
| 2018 | 40 ± 32 | 43 ± 26 | 26 ± 13 | 37 ± 29 | 62 ± 47 |
| 2019 | 39 ± 33 | 36 ± 24 | 22 ± 12 | 35 ± 22 | 62 ± 48 |

Note：SD is standard deviation.

**Table S2.** Non-attainment condition of PM2.5 concentrations in 194 cities during year of 2015 to 2019.

|  |  |  |
| --- | --- | --- |
| Year | Non-attainment citiesNumber (%) | Daily average non-attainment rate |
| Mean ± SD | Range | Median (IQR) |
| 2015 | 159(81.96%) | 23.94% ± 17.23% | 0.00%-68.22% | 21.51%(9.32%-30.96%) |
| 2016 | 145(74.74%) | 20.20% ± 14.73% | 0.00%-58.63% | 17.81%(8.70%-29.59%) |
| 2017 | 144(74.23%) | 20.25% ± 14.56% | 0.00%-58.24% | 16.07%(9.27%-32.35%) |
| 2018 | 120(61.86%) | 15.78% ± 12.68% | 0.00%-45.45% | 12.73%(5.08%-26.44%) |
| 2019 | 110(56.70%) | 11.42% ± 9.32% | 0.00%-28.49% | 10.27%(3.01%-19.25%) |

Note：SD is standard deviation; IQR is interquartile range.

**Figure S1.** Sample sites of 194 prefecture-level and above cities in China.

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**Figure S2.** Temporal distributions of PM2.5 concentrations of 194 cities in China: 2015-2019. **(a)** Monthly distribution of PM2.5. **(b)** Total days distribution of different pollution levels of PM2.5.

**Figure S3.** Spatial distribution maps of daily average non-attainment rate of PM2.5, 2015-2019.

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